

APPENDIX D

Typical Best Management Practices for Operations on the Pacific Outer Continental Shelf

Contents

Introduction 3

Table D.1 Summary of Resources/Potential Impacts and Associated Best Management Practices 4

Typical Best Management Practices that Minimize Effects to Protected Marine Species and Habitats..... 8

 A. Measures to Minimize Interactions with Protected Species during Geophysical Survey Operations 8

 B. Measures to Minimize Vessel Interactions with Protected Species 11

 C. Measures to Minimize Risk During ROV Usage, Buoy Deployment, Operations, and Retrieval 13

 D. Requirements for Protected Species Observers (PSOs)..... 13

 E. Reporting Requirements..... 15

Best Management Practices to Minimize Potential Adverse Impacts to Birds 19

Best Management Practices to Minimize Potential Adverse Impacts to Historic Properties 20

Best Management Practices to Minimize Impacts to Hard Bottom and Anchoring Plan..... 21

Best Management Practice: Prohibition of Trawling for During Project Activities 22

Best Management Practices to Minimize Marine Trash and Debris 23

Introduction

Best Management Practices are schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce impacts to resources. This section lists the Typical Best Management Practices (BMPs) developed by the Bureau of Ocean Energy Management (BOEM) from oil and gas operations in the Pacific Ocean and prior consultations with State of California and Federal agencies. BOEM directs operators to follow these BMPs when conducting actions on or near the Pacific Outer Continental Shelf (OCS). The BMPs minimize or eliminate potential impacts to protected species, including Endangered Species Act (ESA)-listed species of marine mammals and sea turtles.

Table D.1 Summary of Resources/Potential Impacts and Associated Best Management Practices

Description of Potential Impacts	Impact-Producing Factors	Best Management Practices to Avoid or Minimize Impacts from the Proposed Action
<p>Water Quality Impacts to water quality from Proposed Action discharges</p>	<p>Discharges Debris</p>	<p>Under the Clean Water Act (CWA), it is unlawful for any person to discharge any pollutant from a point-source into navigable waters without a permit under its provisions. The Environmental Protection Agency (EPA) regulates discharges incidental to the normal operation of all non-recreational, non-military vessels greater than 24 m (79 ft) in length into U.S. waters, under Section 402 of the CWA (EPA 2013 Vessel General Permit (VGP)).</p> <p>Small vessels and fishing vessels of any size must follow ballast water discharge requirements established in the EPA 2013 VGP and the United States Coast Guard (USCG) ballast water regulations at 33 Code of Federal Regulations (CFR) 151.10.</p> <p>Adherence to applicable permits and regulatory requirements for vessel discharges by local authorities, State of California, USCG, and EPA.</p> <p>Vessel operators will comply with pollution regulations outlined in 33 CFR 151.51-77 so only accidental loss of trash and debris is anticipated.</p>
<p>Marine and Coastal Habitats and Associated Biotic Assemblages Bottom disturbance</p>	<p>Metocean buoy emplacement Sampling methods</p>	<p>Hard Bottom Avoidance and Metocean Buoy Anchoring Plan. Lessees shall avoid contact within hard substrate, rock outcroppings, seamounts, or deep-sea coral/sponge habitat and submit an Anchoring Plan that describes how hard bottom avoidance shall be accomplished during buoy deployment, operations, and retrieval.</p> <p>Lessees will not use bottom trawling to either characterize site-specific parameters within the WEAs to inform their site assessment plan or to generally describe local conditions.</p>
<p>Marine Mammals and Sea Turtles Disturbance of marine mammals by vessel traffic and noise</p>	<p>Noise Vessel strikes Entanglement</p>	<p>Minimize interactions during Geophysical Survey Operations including, but not limited to, the following measures:</p> <ul style="list-style-type: none"> • 1,000 m clearance zone by approved third-party protected species observers around vessels operating noise-producing survey equipment at <180 kHz; • 500 m exclusion zone for ESA-listed whale species around each vessel operating noise-producing survey equipment at <180 kHz; • 30-minute visual clearance of a 1,000 m monitoring zone prior to use of noise-producing survey equipment operating at <180 kHz; • When technically feasible, a “ramp up” of the survey equipment operating at <180 kHz occurs at the start or re-start of geophysical survey activities; and

Description of Potential Impacts	Impact-Producing Factors	Best Management Practices to Avoid or Minimize Impacts from the Proposed Action
		<ul style="list-style-type: none"> • Submission of an Alternative Monitoring Plan detailing monitoring methodology that will be used during nighttime and low-visibility conditions. <p>Use of Vessel Strike Avoidance Measures including, but not limited to, the following measures:</p> <ul style="list-style-type: none"> • All vessels limited to vessel speed of 10 knots in the Action Area; • Maintain a vigilant watch for all protected marine species and slow down, stop, or alter course; • Minimum separation distance of 500 m from all ESA-listed marine mammal species, and 100 m from any sea turtle, around all vessels; and • All crew members responsible for navigation duties must receive site-specific training on protected species sighting/reporting and vessel strike avoidance measures. <p>Prevent entanglement of protected species including, but not limited to, the following measures:</p> <ul style="list-style-type: none"> • Use of best available mooring systems; • Reduce entanglement risk by using: shortest practicable line length, rubber sleeves, weak-links, chains, cables or similar equipment types that prevent lines from looping, wrapping, or entrapping protected species; and • Prompt reporting of entanglement events.
<p>Birds and Bats Disturbance or attraction of birds and bats by lighting, trash, and debris</p>	<p>Lighting Trash and Debris Attraction</p>	<p>Minimize adverse impacts by managing the type of lighting used including, but not limited to, the following measures:</p> <ul style="list-style-type: none"> • Use only red flashing strobe-like lights for aviation obstruction lights; must ensure that these aviation obstruction lights emit infrared energy within 675–900 nanometers wavelength to be compatible with Department of Defense night vision goggle equipment; • Any lights used to aid marine navigation by the Lessee during construction, operations, and decommissioning of a meteorological tower or buoys must meet USCG requirements for private aids to navigation (https://www.uscg.mil/forms/cg/CG_2554.pdf); and

Description of Potential Impacts	Impact-Producing Factors	Best Management Practices to Avoid or Minimize Impacts from the Proposed Action
		<ul style="list-style-type: none"> • Use lighting only when necessary, and the lighting must be hooded downward and directed when possible to reduce upward illumination and illumination of adjacent waters. <p>Use of trash and debris reduction management practices including substituting paper and ceramic cups and dishes for those made of Styrofoam, recycling offshore trash, and transporting and storing supplies and materials in bulk containers when feasible.</p> <p>Use of anti-perching devices on metocean buoys.</p> <p>Annual reporting of any dead birds or bats found on vessels and structures.</p>
<p>Commercial Fishing Proposed Action activities may interfere with fishing</p>	<p>Debris Pollution Traffic</p>	<p>Removal of large marine debris objects and decommissioning of instrumentation at end of 5-year term.</p> <p>Vessel operators are required to comply with pollution regulations outlined in 33 CFR 151.51-77.</p> <p>To enhance navigational safety, lessees will develop a Site Assessment Plan (SAP) that will include site-specific measures including, but not limited to, a Local Notice to Mariners, vessel traffic corridors, lighting specifications, and incident contingency plans.</p>
<p>Historic Properties Impacts to historic properties on the seafloor</p>	<p>Disturbance</p>	<p>Use of high-resolution geotechnical (HRG) surveys prior to geotechnical testing and sediment sampling to avoid impacts on historical properties including, but not limited to:</p> <ul style="list-style-type: none"> • The geophysical surveys must meet BOEM’s minimum standards (see BOEM Archaeological Survey Guidelines); • Analysis by a qualified marine archaeologist who meets both the Secretary of the Interior’s Professional Qualifications Standards (48 Federal Register (FR) 44738–44739) and has experience analyzing marine geophysical data; and • This analysis must include a determination whether any potential archaeological resources are present in the area of potential effect and the geotechnical (sub-bottom) sampling activities must avoid potential archaeological resources by a minimum of 50 m (164 ft). The avoidance distance must be calculated from the maximum discernible extent of the archaeological resource. In no case may the

Description of Potential Impacts	Impact-Producing Factors	Best Management Practices to Avoid or Minimize Impacts from the Proposed Action
		<p>Lessee’s actions impact a potential archaeological resource without BOEM’s prior approval.</p> <p>Observation of unanticipated finds requirement (30 CFR 585.802).</p>

Typical Best Management Practices that Minimize Effects to Protected Marine Species and Habitats

The analysis in the EA assumes the following Best Management Practices will be implemented in Federal waters; however, the Finding of No Significant Impact (FONSI) is not predicated on their implementation.

Additionally, BOEM will require vessels conducting lease characterization studies, surveys, metocean buoy installation, maintenance, or decommissioning, or any other survey activities to travel at speeds no more than 10 knots during all related activities including vessel transit within the Action Area. If future consultation with NMFS, USFWS, or other state or Federal agency results in different vessel speed requirements, BOEM will work with NMFS and California Coastal Commission staff to ensure that any new requirements remain consistent and do not diminish the level of resource protection provided by this requirement.

Any survey monitoring plan must meet the following minimum requirements specified below, except when complying with these requirements would put the safety of the vessel or crew at risk.

A. Measures to Minimize Interactions with Protected Species during Geophysical Survey Operations

To avoid injury of protected marine mammal species and minimize any potential disturbance, the following measures will be implemented for all vessels operating impulsive survey equipment that emits sound at frequency ranges <180 kHz (within the functional hearing range of marine mammals and sea turtles) as well as CHIRP sub bottom profilers (this does not apply to Parametric Sub-bottom Profilers, Ultra Short Baseline, echosounders, or side scan sonar; the acoustic characteristics (frequency, narrow beam width, rapid attenuation) are such that no effects to protected species are anticipated). The Clearance Zone is defined as the area around the sound source that needs to be visually cleared of ESA-listed species for 30 minutes before the sound source is turned on. The Clearance Zone is equivalent to a minimum visibility zone for survey operations to begin (See #1, below). The Shutdown Zone is defined as the area around the sound source that must be monitored for possible shutdown upon detection of ESA-listed whale species within or entering that zone. For both the Clearance and Shutdown Zones, these are minimum visibility distances, and for situational awareness, PSOs should observe beyond this area when possible.

1. For situational awareness, a Clearance Zone must be established around all vessels operating sources <180 kHz (1,000 m for all ESA-listed whale species, 500 m for other marine mammal species, and 100 m for leatherback sea turtles, in all directions).
 - a. The Clearance Zone must be monitored by approved third-party PSOs at all times and any observed protected species must be recorded (see reporting requirements below).
 - b. For monitoring around the autonomous surface vessel (ASV) where remote PSO monitoring must occur from the mother vessel, a dual thermal/HD camera must be installed on the mother vessel facing forward and angled in a direction so as to provide a field of view ahead of the vessel and around the ASV. PSOs must be able to monitor the real-time output of the camera on hand-held computer tablets. Images from the cameras must be able to be captured and reviewed to assist in verifying species identification. A monitor must also be installed in the bridge displaying the real-time

images from the thermal/HD camera installed on the front of the ASV itself, providing a further forward view of the craft. In addition, night-vision goggles with thermal clip-ons and a handheld spotlight must be provided and used such that PSOs can focus observations in any direction around the mother vessel and/or the ASV.

2. Before any noise-producing survey equipment (operating at <180 kHz) is deployed, the Clearance Zone(s) (1,000 m for all ESA-listed whale species, 500 m for other marine mammal species, and 100 m for leatherback sea turtles) must be monitored for 30 minutes of pre-clearance observation.
 - a. If any protected species is observed within the Clearance Zone during the 30-minute pre-clearance period, the 30-minute clock must be paused. If the PSO confirms the animal has exited the zone and headed away from the survey vessel, the 30-minute clock that was paused may resume. The pre-clearance clock will reset to 30 minutes if the animal dives or visual contact is otherwise lost.
3. When technically feasible, a “ramp up” of the electromechanical survey equipment must occur at the start or re-start of geophysical survey activities. A ramp up must begin with the power of the smallest acoustic equipment for the geophysical survey at its lowest power output. When technically feasible, the power will then be gradually turned up and other acoustic sources added in a way such that the source level would increase gradually.
4. To minimize exposure of ESA-Listed marine mammal species to noise that could be disturbing, a 500m Shutdown Zone must be established around the sources operating at <180 kHz being towed from the vessel.
 - a. The Shutdown Zone(s) must be monitored by third-party PSOs at all times when noise-producing equipment (<180 kHz) is being operated and all observed ESA-listed species must be recorded (see reporting requirements below).
 - b. If an ESA-listed whale species is detected within or entering the respective Shutdown Zone, any noise-producing equipment operating below 180 kHz must be shut off until the minimum separation distance from the source is re-established and the measures in A5 are carried out.
 - i. A PSO must notify the survey crew that a shutdown of all active acoustic sources operating below 180 kHz is immediately required. The vessel operator and crew must comply immediately with any call for a shutdown by the PSO. Any disagreement or discussion must occur only after shutdown.
 - c. If the Shutdown Zone(s) cannot be adequately monitored for ESA-listed whale species presence (i.e., a PSO determines conditions, including at night or other low-visibility conditions, are such that ESA-listed species cannot be reliably sighted within the Shutdown Zone(s), no equipment operating at <180 kHz can be deployed until such time that the Shutdown Zone(s) can be reliably monitored.
5. Following a shutdown for any reason, ramp up of the equipment may begin immediately only if:
 - (a) the shutdown is less than 30 minutes,
 - (b) visual monitoring of the Shutdown Zone(s) continued throughout the shutdown,
 - (c) the animal(s) causing the shutdown was visually followed and confirmed by PSOs to be outside of the Shutdown Zone(s) (500 m for ESA-listed

whale species, and heading away from the vessel, and (d) the Shutdown Zone(s) remains clear of all ESA-listed species. If all (a, b, c, and d) the conditions are not met, the Clearance Zone (1,000 m for all ESA-listed whale species, 500 m for other marine mammal species, 100m for leatherback sea turtles) must be monitored for 30 minutes of pre-clearance observation before noise-producing equipment can be turned back on.

6. In order for geophysical surveys to be conducted at night or during low-visibility conditions, PSOs must be able to effectively monitor the Clearance and Shutdown Zone(s). No geophysical surveys may occur if the Shutdown Zone(s) cannot be reliably monitored for the presence of ESA-listed whale species to ensure avoidance of impact to those species.
 - a. An Alternative Monitoring Plan (AMP) must be submitted to BOEM (or the Federal agency authorizing, funding, or permitting the survey) detailing the monitoring methodology that will be used during nighttime and low visibility conditions and an explanation of how it will be effective at ensuring that the Shutdown Zone(s) can be maintained during nighttime and low-visibility survey operations. The plan must be submitted 60 days before survey operations are set to begin.
 - b. The plan must include technologies that have the technical feasibility to detect all ESA-listed whales out to 1,000 m and leatherback sea turtles out to 100 m.
 - c. PSOs should be trained and experienced with the proposed alternative monitoring technology.
 - d. The AMP must describe how calibration will be performed, for example, by including observations of known objects at set distances and under various lighting conditions. This calibration should be performed during mobilization and periodically throughout the survey operation.
 - e. PSOs shall make nighttime observations from a platform with no visual barriers, due to the potential for the reflectivity from bridge windows or other structures to interfere with the use of the night vision optics.
7. At times when multiple survey vessels are operating within a lease area, adjacent lease areas, or exploratory cable routes, a minimum separation distance (to be determined on a survey specific basis, dependent on equipment being used) must be maintained between survey vessels to ensure that sound sources do not overlap.
8. Any visual observations of ESA-listed species by crew or project personnel must be communicated to PSOs on-duty.
9. During good conditions (e.g., daylight hours; Beaufort scale 3 or less) when survey equipment is not operating, to the maximum extent practicable, PSOs must conduct observations for protected species for comparison of sighting rates and behavior with and without use of active geophysical survey equipment. Any observed ESA-listed species must be recorded regardless of any mitigation actions required.

B. Measures to Minimize Vessel Interactions with Protected Species

All vessels associated with survey activities (transiting [i.e., travelling between a port and the survey site] or actively surveying) must comply with the vessel strike avoidance measures specified below. The only exception is when the safety of the vessel or crew necessitates deviation from these requirements. If any such incidents occur, they must be reported as outlined below under Reporting Requirements. The Vessel Strike Avoidance Zone is defined as 500 m or greater from any sighted ESA-listed whale species or other unidentified large marine mammal and 100 m from any sea turtle.

Lessees are directed to the National Marine Fisheries Service’s Marine Life Viewing Guidelines, which highlight the importance of these measures for avoiding impacts to mother/calf pairs (<https://www.fisheries.noaa.gov/topic/marine-life-viewing-guidelines#guidelines-&-distances>).

1. Vessel captain and crew must maintain a vigilant watch for all protected marine species and slow down, stop their vessel, or alter course, as appropriate, regardless of vessel size, to avoid striking any protected species. The presence of a single individual at the surface may indicate the presence of submerged animals in the vicinity; therefore, precautionary measures should always be exercised. If pinnipeds or small delphinids of the following genera: *Delphinus*, *Lagenorhynchus*, *Tursiops*, and *Phocoena* are visually detected approaching the vessel (i.e., to bow ride) or towed equipment, vessel strike avoidance and shutdown is not required.
2. Anytime a survey vessel is underway (transiting or surveying), the vessel must maintain a 500 m minimum separation distance (Vessel Strike Avoidance Zone) from any sighted ESA-listed marine mammal species or other unidentified large marine mammal, and 100 m from any sea turtle. Trained PSOs must be on board monitoring this vessel strike avoidance zone to ensure detection of that animal in time to take necessary measures to avoid striking the animal. If the survey vessel does not require a PSO for the type of survey equipment used, a trained crew lookout may be used (see B9).
 - a. For monitoring around the autonomous surface vessels, regardless of the equipment it may be operating, a dual thermal/HD camera must be installed on the mother vessel facing forward and angled in a direction so as to provide a field of view ahead of the vessel and around the ASV. A dedicated operator must be able to monitor the real-time output of the camera on hand-held computer tablets. Images from the cameras must be able to be captured and reviewed to assist in verifying species identification. A monitor must also be installed in the bridge displaying the real-time images from the thermal/HD camera installed on the front of the ASV itself, providing a further forward view of the craft.
3. Survey plans must include identification of vessel strike avoidance measures, including procedures for equipment shut down and retrieval, communication between PSOs/crew lookouts, equipment operators, and the captain, and other measures necessary to avoid vessel strike while maintaining vessel and crew safety. If any circumstances are anticipated that may preclude the implementation of this requirement, they must be clearly identified in the survey plan and alternative procedures outlined in the plan to ensure minimum distances are maintained and vessel strikes can be avoided.
4. All vessel crew members must be briefed in the identification of protected marine species that may occur in the survey area and in regulations and best practices for avoiding vessel collisions.

Reference materials must be available aboard all project vessels for identification of ESA-listed species. The expectation and process for reporting of protected species sighted during surveys must be clearly communicated and posted in highly visible locations aboard all project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process outlined for crew members to do so.

5. If a large whale is identified within 500 m of the forward path of any vessel, the vessel operator must steer a course away from the whale at 10 knots (18.5 km/hr) or less until the 500 m minimum separation distance has been established. Vessels may also shift to idle if feasible.
6. If a large whale is sighted within 200 m (656 ft) of the forward path of a vessel, the vessel operator must reduce speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 500 m (1,640 ft). If stationary, the vessel must not engage engines until the large whale has moved beyond 500 m.
7. If a sea otter or sea turtle is sighted within the operating vessel's forward path, the vessel operator must slow down to 4 knots (unless unsafe to do so) and steer away as possible. The vessel may resume normal operations once the vessel has passed the individual.
8. During times of year when sea turtles are known to occur in the survey area, vessels must avoid transiting through areas of visible jellyfish aggregations. In the event that operational safety prevents avoidance of such areas, vessels must slow to 4 knots while transiting through these areas.
9. To monitor the Vessel Strike Avoidance Zone, a PSO (or crew lookout if PSOs are not required) must be posted during all times a vessel is underway (transiting or surveying) to monitor for protected species within a 180-degree direction of the forward path of the vessel (90 degrees port to 90 degrees starboard).
10. If the trained lookout is a vessel crew member, this must be their designated role and primary responsibility while the vessel is underway. Any designated crew lookouts must receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. All observations must be recorded per reporting requirements.
11. Regardless of monitoring duties, all crew members responsible for navigation duties must receive site-specific training on protected species sighting/reporting and vessel strike avoidance measures.
12. Vessels underway must not divert their course to approach any listed species.
13. Wherever available, the Lessee must ensure all vessel operators check for daily information regarding protected species sighting locations. These media may include, but are not limited to: Channel 16 broadcasts, Whalesafe.com, and the Whale/Ocean Alert App.

C. Measures to Minimize Risk During ROV Usage, Buoy Deployment, Operations, and Retrieval

Any mooring systems used during survey activities prevent any potential entanglement of listed species, and in the unlikely event that entanglement does occur, ensure proper reporting of entanglement events according to the measures specified below.

1. ROVs: A Clearance Zone (1,000 m for all ESA-listed whale species, 500 m for other marine mammal species, and 100m for leatherback sea turtles) must be monitored for 30 minutes of pre-clearance observation by PSOs before ROVs are deployed. If any ESA-listed species is observed within the Clearance Zone during the 30-minute pre-clearance period, the 30-minute clock must be paused. If the PSO confirms the animal has exited the zone and headed away from the survey vessel, the 30-minute clock that was paused may resume. The pre-clearance clock will reset to 30 minutes if the animal dives or visual contact is otherwise lost.
2. The Lessee must ensure that any buoys attached to the seafloor use the best available mooring systems. Buoys, lines (chains, cables, or coated rope systems), swivels, shackles, and anchor designs must prevent any potential entanglement of listed species while ensuring the safety and integrity of the structure or device.
3. All mooring lines and ancillary attachment lines must use one or more of the following measures to reduce entanglement risk: shortest practicable line length, rubber sleeves, weak-links, chains, cables, or similar equipment types that prevent lines from looping, wrapping, or entrapping protected species.
4. Any equipment must be attached by a line within a rubber sleeve for rigidity. The length of the line must be as short as necessary to meet its intended purpose.
5. If a live or dead marine protected species becomes entangled, the Lessee must immediately contact the applicable stranding network coordinator using the reporting contact details (see Reporting Requirements section below) and provide any on-water assistance requested.
6. All buoys must be properly labeled with the Lessee's contact information.

D. Requirements for Protected Species Observers (PSOs)

The Lessee must use qualified third-party PSOs to observe Vessel Strike Avoidance, Clearance, and Exclusion Zones as outlined in the conditions above.

1. All PSOs must have received NMFS approval to act as a PSO for geophysical surveys. The Lessee must provide to BOEM, upon request, documentation of NMFS approval as PSOs for geophysical activities in the Pacific and copies of the most recent training certificates of individual PSOs' successful completion of a commercial PSO training course with an overall examination score of 80% or greater. Instructions and application requirements to become a NMFS-approved PSO can be found at: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/careers-and-opportunities/protected-species-observers>.
2. PSOs deployed for geophysical survey activities must be employed by a third-party observer provider. While the vessel is underway, they must have no other tasks other than to conduct observational effort, record data, and communicate with and instruct relevant vessel crew to

the presence of protected species and associated mitigation requirements. PSOs on duty must be clearly listed on daily data logs for each shift.

- a. Non-third-party observers may be approved by NMFS on a case-by-case basis for limited, specific duties in support of approved third-party PSOs.
3. The Lessee must ensure that the observers have the authority to stop any activity that could result in harm to a marine mammal or sea turtle, except under extraordinary circumstances when complying with this requirement would put the safety of the vessel or crew at risk.
4. A minimum of one PSO (assuming condition 6 is met) must be observing for protected marine mammal species at all times when noise-producing equipment operating at <180 kHz, or the survey vessel is actively transiting. The Lessee must include a PSO schedule showing that the number of PSOs used is sufficient to effectively monitor the affected area for the project (e.g., surveys) and record the required data. PSOs must not be on watch for more than 4 consecutive hours, with at least a 2-hour break after a 4-hour watch. PSOs must not work for more than 12 hours in any 24-hour period.
5. In situations where third-party PSOs are not required, crew members serving as lookouts must receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements.
6. Visual monitoring must occur from the most appropriate vantage point on the associated operational platform that allows for 360-degree visual coverage around the vessel. If 360-degree visual coverage is not possible from a single vantage point, multiple PSOs must be on watch to ensure such coverage.
7. The Lessee must ensure that suitable equipment is available to each PSO to adequately observe the full extent of the Vessel Strike Avoidance, Clearance and Exclusion Zones during all vessel operations and meet all reporting requirements.
 - a. Visual observations must be conducted using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.
 - b. Rangefinders (at least one per PSO, plus backups) or reticle binoculars (e.g., 7 x 50) of appropriate quality (at least one per PSO, plus backups) to estimate distances to ESA-listed species located in proximity to the vessel and Vessel Strike Avoidance, Clearance and Exclusion Zone(s).
 - c. Digital full frame cameras with a telephoto lens that is at least 300 mm or equivalent on a full-frame single lens reflex (SLR). The camera or lens should also have an image stabilization system. The camera system must be used to record sightings and verify species identification whenever possible.
 - d. A laptop or tablet to collect and record data electronically.
 - e. Global Positioning System (GPS) Units if data collection/reporting software does not have built-in positioning functionality.

- f. PSO data must be collected in accordance with standard data reporting software tools, and electronic data submission standards approved by BOEM and NMFS for the particular activity.
- g. Any other tools deemed necessary to adequately perform PSO tasks.

E. Reporting Requirements

Reporting ensures compliance with and evaluate effectiveness of environmental protection measures.

1. Data from all PSO observations must be recorded based on standard PSO collection and reporting requirements. PSOs must use standardized electronic data forms to record data. The following information must be reported electronically in a format approved by BOEM and NMFS:

Visual Effort:

- a. Vessel name.
- b. Dates of departures and returns to port with port name.
- c. Lease number.
- d. PSO names and affiliations.
- e. PSO identification (if applicable).
- f. PSO location on vessel.
- g. Height of observation deck above water surface.
- h. Visual monitoring equipment used.
- i. Dates and times (Greenwich Mean Time) of survey on/off effort and times corresponding with PSO on/off effort.
- j. Vessel location (latitude/longitude, decimal degrees) when survey effort begins and ends; vessel location at beginning and end of visual PSO duty shifts; recorded at 30-second intervals if obtainable from data collection software.
- k. Vessel heading and speed at beginning and end of visual PSO duty shifts and upon any change.
- l. Water depth (if obtainable from data collection software).
- m. Environmental conditions while on visual survey (at beginning and end of PSO shift and whenever conditions change significantly), including wind speed and direction, Beaufort scale, Beaufort wind force, swell height, swell angle, precipitation, cloud cover, temperature, sun glare, and overall visibility to the horizon.
- n. Factors that may be contributing to impaired observations during each PSO shift change or as needed as environmental conditions change (e.g., vessel traffic, equipment malfunctions).

- o. Survey activity information, such as type of survey equipment in operation, acoustic source power output while in operation, and any other notes of significance (i.e., pre-clearance survey, ramp-up, shutdown, end of operations, etc.).

Visual Sighting (all Visual Effort fields plus):

- a. Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform).
- b. Vessel/survey activity at time of sighting.
- c. PSO/PSO ID who sighted the animal.
- d. Time of sighting.
- e. Initial detection method.
- f. Sightings cue.
- g. Vessel location at time of sighting (decimal degrees).
- h. Direction of vessel's travel (compass direction).
- i. Direction of animal's travel relative to the vessel.
- j. Identification of the animal (e.g., genus/species, lowest possible taxonomic level, or unidentified); also note the composition of the group if there is a mix of species.
- k. Species reliability.
- l. Radial distance.
- m. Distance method.
- n. Group size; estimated number of animals (high/low/best).
- o. Estimated number of animals by cohort (adults, yearlings, juveniles, calves, group composition, etc.).
- p. Description (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).
- q. Detailed behavior observations (e.g., number of blows, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior).
- r. Mitigation Action. Description of any actions implemented in response to the sighting (e.g., delays, shutdown, ramp-up, speed or course alteration, etc.) and time and location of the action.
- s. Behavioral Observation to Mitigation.

- t. Equipment Operating During Sighting.
 - u. Source Depth.
 - v. Source Frequency.
 - w. Animal's closest point of approach and/or closest distance from the center point of the acoustic source.
 - x. Time Entered Exclusion Zone.
 - y. Time Exited Exclusion Zone.
 - z. Time in Exclusion Zone.
 - aa. Photos/Video.
2. The PSO Provider or Lessee must submit raw PSO sightings and trackline data by the 15th of each month for the previous calendar month of surveys to BOEM and NMFS (details to be provided). Data must be submitted in Excel spreadsheet format or in another format approved by BOEM and NMFS.
 3. The Lessee must submit a monitoring report to BOEM, NMFS, and to the California Coastal Commission within 90 days after completion of yearly survey activities. The report must fully document the methods and monitoring protocols, summarize the data recorded during monitoring, estimate the number of protected and/or ESA-listed species that may have been taken during survey activities; and describe, assess, and compare the effectiveness of monitoring and mitigation measures. PSO raw sightings and trackline data must also be provided with the final monitoring report.
 4. In the event of a vessel strike of a protected species by any survey vessel, the Lessee must immediately report the incident to BOEM (details to be provided), NMFS (details to be provided), and the NOAA West Coast Region Stranding Hotline at 1-866-767-6114 and 562-506-4315. The report must include the following information:
 - a. Name, telephone, and email of the person providing the report.
 - b. The vessel name.
 - c. The Lease Number.
 - d. Time, date, and location (latitude/longitude) of the incident.
 - e. Species identification (if known) or description of the animal(s) involved.
 - f. Vessel's speed during and leading up to the incident.
 - g. Vessel's course/heading and what operations were being conducted (if applicable).
 - h. Status of all sound sources in use.
 - i. 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.

- j. Environmental conditions (wave height, wind speed, light, cloud cover, weather, water depth).
 - k. Estimated size and length of animal that was struck.
 - l. Description of the behavior of the species immediately preceding and following the strike.
 - m. If available, description of the presence and behavior of any other protected species immediately preceding the strike.
 - n. Disposition of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, last sighted direction of travel, status unknown, disappeared).
 - o. To the extent practicable, photographs or video footage of the animal(s).
5. The Lessee must ensure that sightings of any injured or dead protected species are immediately reported, regardless of whether the injury or death is related to survey operations, to BOEM (details to be provided), NMFS (details to be provided), and the NOAA West Coast stranding hotline at 1-866-767-6114 and 562-506-4315. If an entangled whale is sighted, the Lessee must ensure that NOAA is contacted at 1-877-767-9425 or hail the USCG on Channel 16. If the Lessee's activity is responsible for the injury, entanglement or death, the Lessee must ensure that the vessel assist in any salvage effort as requested by NMFS. When reporting sightings of injured or dead protected species, the following information must be included:
- a. Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable).
 - b. Species identification (if known) or description of the animal(s) involved.
 - c. Condition of the animal(s) (including carcass condition if the animal is dead).
 - d. Observed behaviors of the animal(s), if alive.
 - e. If available, photographs or video footage of the animal(s).
 - f. General circumstances under which the animal was discovered.
6. Reporting and Contact Information:
- a. Dead and/or Injured Protected Species:
 - i. NOAA West Coast stranding hotline at 1-866-767-6114 and 562-506-4315.
 - b. Injurious Takes of Endangered and Threatened Species:
 - ii. NOAA NMFS Long Beach Office, Protected Resources Division (details to be provided).
 - iii. BOEM Office of Environment, Pacific Region (details to be provided).

Best Management Practices to Minimize Potential Adverse Impacts to Birds

To minimize the potential for adverse impacts on birds, BOEM has developed measures to reduce or eliminate the potential risks to or conflicts with specific environmental resources. If leases or grants are issued, BOEM will require the Lessee to comply with these measures through lease stipulations and/or as conditions of SAP approval. The following measures are intended to ensure that the potential for adverse impacts on birds is minimized, if not eliminated. The Lessee will use only red flashing strobe-like lights for aviation obstruction lights and must ensure that these aviation obstruction lights emit infrared energy within 675–900 nanometers wavelength to be compatible with Department of Defense night vision goggle equipment.

- a. Any lights used to aid marine navigation by the Lessee during construction, operations and decommissioning of a meteorological tower or buoys must meet USCG requirements for private aids to navigation (https://www.uscg.mil/forms/cg/CG_2554.pdf).
- b. For any additional lighting not described in (1) or (2) above, the Lessee must use such lighting only when necessary, and the lighting must be hooded downward and directed when possible, to reduce upward illumination and illumination of adjacent waters.
- c. An annual report shall be provided to BOEM documenting any dead birds or bats found on vessels and structures during construction, operations, and decommissioning. The report must contain the following information: the name of species, date found, location, a picture to confirm species identity (if possible), and any other relevant information. Carcasses with Federal or research bands must be reported to the U.S. Geological Survey's Bird Band Laboratory, available at <https://www.pwrc.usgs.gov/bbl/>.
- d. Anti-perching devices must be installed on the metocean buoys in order to minimize the attraction of birds.

Best Management Practices to Minimize Potential Adverse Impacts to Historic Properties

- a. The Lessee may only conduct geotechnical exploration activities, including geotechnical sampling or other direct sampling or investigation techniques, in areas of the leasehold in which an analysis of the results of geophysical surveys have been completed for that area. The geophysical surveys must meet BOEM’s minimum standards (see BOEM Archaeological Survey Guidelines), and the analysis must be completed by a qualified marine archaeologist who meets both the Secretary of the Interior’s Professional Qualifications Standards (48 Federal Register (FR) 44738–44739) and has experience analyzing marine geophysical data. This analysis must include a determination whether any potential archaeological resources are present in the area and the geotechnical (sub-bottom) sampling activities must avoid potential archaeological resources by a minimum of 50 m (164 ft). The avoidance distance must be calculated from the maximum discernible extent of the archaeological resource. In no case may the Lessee’s actions impact a potential archaeological resource without BOEM’s prior approval
- b. BOEM requires that the Lessee observe the unanticipated finds requirements stipulated in 30 CFR 585.802. If the Lessee, while conducting activities, discovers a potential archaeological resource while conducting construction activities or other activities, the Lessee must immediately halt all seafloor-disturbing activities within the area of discovery, notify BOEM within 72 hours of the discovery, keep the location of the discovery confidential and not take any action that may adversely affect the resource until BOEM has made an evaluation and instructed the Lessee on how to proceed, and conduct any additional investigations as directed by BOEM to determine if the resources is eligible for listing in the National Register of Historic Places (30 CFR 585.802(b)).

Best Management Practices to Minimize Impacts to Hard Bottom and Anchoring Plan

- a. Lessees and their contractors shall avoid intentional contact within hard substrate, rock outcroppings, seamounts, or deep-sea coral/sponge habitat and include a buffer that protects these habitats from bottom contact, including but not limited to anchoring, mooring (for project buoys), and sediment sampling. The Lessee shall submit an Anchoring Plan to BOEM as part of any survey plan that requires vessel anchoring. The Plan shall describe how the Lessee will avoid placing anchors on sensitive ocean floor habitats and shall include the following information: 1) A list of all vessels that will anchor during survey activities and the number and size of anchors to be set; 2) Detailed maps showing proposed anchoring sites that are located at a distance that safely clears (at least 12 m (40 ft) and more area in < 400m depths) from hard substrate and other anthropogenic features (e.g., power cables), if present; 3) A description of the navigation equipment that would be used to ensure anchors are accurately set; and 4) Anchor handling procedures that would be followed to prevent or minimize anchor dragging, such as placing and removing all anchors vertically.

Best Management Practice: Prohibition of Trawling for During Project Activities

- a. Lessees will characterize site-specific parameters within the WEAs to inform their site assessment plan and to generally describe local conditions, including biological attributes. Lessees and their contractors may employ a range of methods to accomplish these goals but may not employ trawling methodology (as defined by 50 CFR§ 660.11 (11)) to conduct these activities.

Best Management Practices to Minimize Marine Trash and Debris

“Marine trash and debris” is defined as any object or fragment of wood, metal, glass, rubber, plastic, cloth, paper or any other solid, man-made item or material that is lost or discarded in the marine environment by the Lessee or an authorized representative of the Lessee (collectively, the “Lessee”) while conducting activities on the OCS in connection with a lease, grant, or approval issued by the Department of the Interior (DOI). To understand the type and amount of marine debris generated, and to minimize the risk of entanglement in and/or ingestion of marine debris by protected species, lessees must implement the following measures.

- a. The Lessee must practice trash and debris reduction and handling practices to reduce the amount of offshore trash that could potentially be lost into the marine environment. These trash management practices include substituting paper and ceramic cups and dishes for those made of Styrofoam or other extruded polystyrene foam, recycling offshore trash, and transporting and storing supplies and materials in bulk containers when feasible and have resulted in a reduction of accidental loss of trash and debris.
- b. Training: All vessel operators, employees, and contractors performing OCS survey activities on behalf of the Lessee (collectively, “Lessee Representatives”) must complete marine trash and debris awareness training annually. The training consists of two parts: (1) viewing a marine trash and debris training video or slide show (described below); and (2) receiving an explanation from management personnel that emphasizes their commitment to the requirements. The marine trash and debris training videos, training slide packs, and other marine debris related educational material may be obtained at <https://www.bsee.gov/debris>. The training videos, slides, and related material may be downloaded directly from the website. Lessee Representatives engaged in OCS survey activities must continue to develop and use a marine trash and debris awareness training and certification process that reasonably assures that they, as well as their respective employees, contractors, and subcontractors, are in fact trained. The training process must include the following elements:
 - i. Viewing of either a video or slide show by the personnel specified above;
 - ii. An explanation from management personnel that emphasizes their commitment to the requirements;
 - iii. Attendance measures (initial and annual); and
 - iv. Recordkeeping and availability of records for inspection by DOI. By January 31 of each year, the Lessee must submit to DOI an annual report signed by the Lessee that describes its marine trash and debris awareness training process and certifies that the training process has been followed for the previous calendar year. The Lessee must send the reports via email to marinedebris@bsee.gov.
- c. Marking: Materials, equipment, tools, containers, and other items used in OCS activities which are of such shape or configuration that they are likely to snag or damage fishing devices, and could be lost or discarded overboard, must be clearly marked with the vessel or facility identification and properly secured to prevent loss overboard. All markings must clearly identify the owner and must be durable enough to resist the effects of the environmental conditions to which they may be exposed.

- d. Recovery: Lessees must recover marine trash and debris that is lost or discarded in the marine environment while performing OCS activities when such incident is likely to: (a) cause undue harm or damage to natural resources, including their physical, atmospheric, and biological components, with particular attention to those that could result in the entanglement of or ingestion by marine protected species; or (b) significantly interfere with OCS uses (e.g., are likely to snag or damage fishing equipment, or present a hazard to navigation). Lessees must notify DOI when recovery activities are (i) not possible because conditions are unsafe; or (ii) not practicable because the marine trash and debris released is not likely to result in any of the conditions listed in (a) or (b) above. The Lessee must recover the marine trash and debris lost or discarded if DOI does not agree with the reasons provided by the Lessee to be relieved from the obligation to recover the marine trash and debris. If the marine trash and debris is located within the boundaries of a potential archaeological resource/avoidance area, or a sensitive ecological/benthic resource area, the Lessee must contact DOI for approval prior to conducting any recovery efforts.

Recovery of the marine trash and debris should be completed immediately, but no later than 30 days from the date in which the incident occurred. If the Lessee is not able to recover the marine trash or debris within 48 hours (See # F. Reporting), the Lessee must submit recovery plan to DOI explaining the recovery activities to recover the marine trash or debris (“Recovery Plan”). The Recovery Plan must be submitted no later than 10 calendar days from the date in which the incident occurred. Unless otherwise objected by DOI within 48 hours of the filing of the Recovery Plan, the Lessee can proceed with the activities described in the Recovery Plan. The Lessee must request and obtain approval of a time extension if recovery activities cannot be completed within 30 days from the date in which the incident occurred. The Lessee must enact steps to prevent similar incidents and must submit a description of these actions to BOEM and BSEE within 30 days from the date in which the incident occurred.

- e. Reporting: The Lessee must report all marine trash and debris lost or discarded to DOI (using the email address listed on DOI’s most recent incident reporting guidance). This report applies to all marine trash and debris lost or discarded, and must be made monthly, no later than the fifth day of the following month. The report must include the following:
- i. Project identification and contact information for the Lessee, operator, and/or contractor;
 - ii. The date and time of the incident;
 - iii. The lease number, OCS area and block, and coordinates of the object’s location (latitude and longitude in decimal degrees);
 - iv. A detailed description of the dropped object to include dimensions (approximate length, width, height, and weight) and composition (e.g., plastic, aluminum, steel, wood, paper, hazardous substances, or defined pollutants);
 - v. Pictures, data imagery, data streams, and/or a schematic/illustration of the object, if available;
 - vi. Indication of whether the lost or discarded item could be a magnetic anomaly of greater than 50 nanoTesla (nT), a seafloor target of greater than 0.5 meters (m), or a

- sub-bottom anomaly of greater than 0.5m when operating a magnetometer or gradiometer, side scan sonar, or sub-bottom profile in accordance with DOI’s applicable guidance;
- vii. An explanation of how the object was lost; and
 - viii. A description of immediate recovery efforts and results, including photos.
- f. In addition to the foregoing, the Lessee must submit a report within 48 hours of the incident (“48-hour Report”) if the marine trash or debris could (a) cause undue harm or damage to natural resources, including their physical, atmospheric, and biological components, with particular attention to those that could result in the ingestion by or entanglement of marine protected species; or (b) significantly interfere with OCS uses (e.g., are likely to snag or damage fishing equipment, or present a hazard to navigation). The information in the 48-hour Report would be the same as that listed above, but just for the incident that triggered the 48-hour Report. The Lessee must report to DOI if the object is recovered and, as applicable, any substantial variation in the activities described in the Recovery Plan that were required during the recovery efforts. Information on unrecovered marine trash and debris must be included and addressed in the description of the site clearance activities provided in the decommissioning application required under 30 CFR § 585.906. The Lessee is not required to submit a report for those months in which no marine trash and debris was lost or discarded.
- g. At the end of the 5-year term data collection instrumentation will be decommissioned, and large marine debris objects removed.
- h. Vessel operators will comply with pollution regulations outlined in 33 CFR 151.51-77.