

Site Characterization & Site Assessment on OCS Leases

What are Project Design Criteria (PDCs) and Best Management Practices (BMPs)?

PDCs are the general mitigation, monitoring, and reporting requirements that apply to geological and geophysical surveys, and other data collection activities on Outer Continental Shelf (OCS) leases. These PDCs are intended to avoid, minimize, and monitor effects to protected species of marine mammals, sea turtles, fish, and their habitats. BMPs are the more detailed conditions explaining how to carry out each PDC.

[PDC 1] Avoid Live Bottom Features

To provide protection to corals, live-bottom habitats, and areas important to threatened or endangered species to reduce the risk of adverse effects to discountable levels.

- Avoid all sensitive live bottom habitats (eelgrass, cold-water corals, etc.) as practicable.

[PDC 2] Avoid Spawning and Developmental Habitat of Sturgeon

To protect spawning and rearing areas within freshwater reaches of shortnose and Atlantic sturgeon habitats during surveys of cable corridors.

- Time of year restrictions that avoids geotechnical or benthic sampling activities in freshwater reaches (salinity 0.0-0.5 ppt) of rivers during the time of year when Atlantic sturgeon spawning and rearing of early life stages occurs in a river.

[PDC 3] Marine Debris Awareness and Elimination

To avoid discharges of marine debris that may impact protected species through entanglement, entrapment, or incidental ingestion.

- Provide informational training to all employees and contract personnel on the proper storage and disposal practices at-sea to reduce the likelihood of accidental discharge of marine debris.
- Require identifying marking of offshore equipment.
- Reporting and recovery plans of any lost debris that may cause undue harm or damage to natural resources.

[PDC 4] Minimize Interactions with Protected Species during Geophysical Survey Operations

To avoid injury of marine mammals and minimize the likelihood of adverse effects associated with underwater noise from geophysical surveys.

- Establish Clearance Zones and Shutdown Zones for sparkers, boomers, and bubble guns, or similar equipment.
- Protected species observers (PSOs) to watch for and record protected species before and during geophysical surveys.
- PSOs to call for the implementation of shutdown requirements when animals are within a Shutdown Zone.
- Alternative technologies such as night vision and passive acoustic monitoring to watch for protected species under low visibility conditions.

[PDC 5] Minimize Vessel Interactions with Protected Species

To avoid injuring or disturbance by establishing minimum separation distances between vessels and marine protected species.

- Post a PSO or Trained Lookout on vessels.
- Maintain a distance of 500 meters from all large whales and sea turtles.
- Report all NARWs.
- Shift engine to neutral if large whales are sighted within 200 meters of vessel or reduce speeds to 4 knots for sea turtles.
- Check daily NARWs sightings and all vessels to slow to 10 knots within Seasonal Management Areas.

[PDC 6] Minimize Risk During Buoy Deployment, Operations, and Retrieval

To avoid entanglement and entrapment of protected species in moored devices.

- Buoys attached to the seafloor to use the best available mooring systems. (chains, cables, or coated rope systems, swivels, shackles, and anchor designs).
- All lines to use one or more of the following: shortest practicable line length, rubber sleeves, weak-links, chains, cables, or similar equipment types that prevent lines from looping, wrapping, or entrapping protected species.
- 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.

[PDC 7] Protected Species Observer Requirements

To avoid and minimize impacts to protected species by requiring PSO training; approval requirements by NMFS, and other requirements.

- All PSOs must have completed a training program with BOEM-approved PSO training materials.
- All PSOs to receive NMFS approval before deployment on any geophysical survey.
- PSOs to be deployed by a third-party observer provider.
- Maximum hours per shift and daily hours to avoid observer fatigue.
- Minimum equipment requirements of PSOs.

[PDC 8] Monthly and Final Reporting Requirements

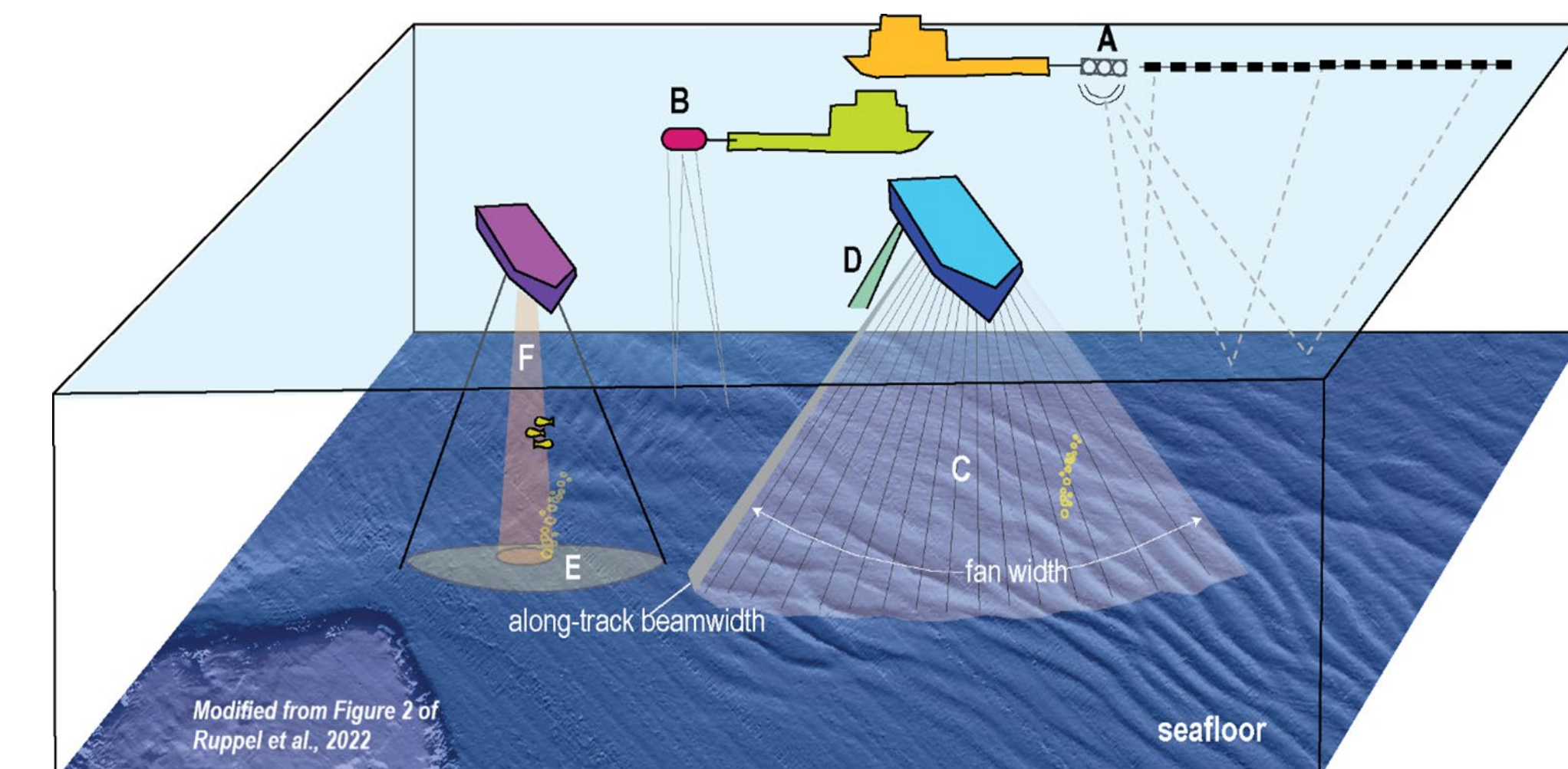
To allow BOEM to monitor compliance and analyze mitigation effectiveness.

- Required reporting of any sighted dead or injured protected species.
- Monthly reporting of raw data.
- Final reporting 90 days following conclusion of a survey.
- Standard reporting fields and standard field codes for all PSOs.
 - Beaufort Scale
 - Standard units for time, location, distance, speed, and direction
 - Monitoring equipment and distance-finding method codes
 - Species identification codes
 - Behavioral state/response codes

What are High-Resolution Geophysical Surveys?

HRG surveys occur to acquire geophysical information to:

- Determine seabed conditions for wind turbine generator foundations to support turbines.
- Obtain information pertaining to the presence or absence of archaeological resources.
- Characterize benthic resources and sensitive habitats.
- Conduct bathymetric charting.
- Identify suitable anchoring and foundation locations, cable routes, and geophysical properties to inform engineering decisions.



Modified from Figure 2 of Ruppel et al., 2022
Schematic diagram showing common high-resolution geophysical (HRG) sources. High-Resolution Geophysical surveys (HRG surveys) Airgun arrays are not shown because this type of survey equipment is not used for offshore wind surveys.

(A) HRG seismic sources such as boomers, bubble guns, and sparkers are towed behind a ship, with impulsive signals received on a streamer of receivers or on ocean bottom receivers.

(B) Towed subbottom profilers (SBP) transmit signals and receive acoustic returns in the same instrument package and are intermittent, non-impulsive sources that are not considered to be seismic sources.

(C) Multibeam echosounders (MBES) detect seafloor depth and roughness and water column anomalies (like the bubble plume shown in yellow), transmitting sound in a fan that forms a swath extending on either side of the vessel. This MBES system is hull-mounted, but MBES can also be deployed in other geometries or on remote vehicles.

(D) Hull-mounted acoustic doppler current profiler (ADCP), whose narrow beams are aimed at 20–30 degrees from the vertical.

(E) A hull-mounted SBP system ensonifies a cone below the vessel and can image tens of meters into the seafloor in some settings.

(F) Single-beam echosounder (SBES) such as the EK60/EK80 detects water column seafloor anomalies such as fish, biological scatterers, and determine water depth.