

**APPENDIX D: MITIGATION MEASURES DURING NOS MAPPING AND  
SURVEYING ACTIVITIES**

## Mitigation Measures During NOS Mapping and Surveying Activities

**General Note:** These requirements do not apply when (1) compliance would create an imminent threat to a person or vessel, or (2) to the extent that a vessel cannot comply because it is restricted in its ability to maneuver.

Triggering Event	Crew Response
<b>General</b>	
Vessel and equipment maintenance	All NOS projects would implement mandatory invasive species prevention procedures including, but not limited to, vessel and equipment washdown (including diving equipment), cleaning, and de-ballasting (exchange of ballast water in open ocean waters for those vessels used by NOS that have ballast tanks).
At all times while in transit or on-project	Do not attempt to feed, touch, ride, or otherwise intentionally interact with any marine protected species.
At all times while in transit or on-project	Vessel crew must maintain at least one Protected Species Observer (PSO) at all times. This individual may perform other duties simultaneously. PSOs should use all means necessary to enhance visibility (e.g., spotlights, night vision, Forward Looking Infrared), and will be trained according to NOS Standard Operating Procedures.
<b>Project Planning / Coordination</b>	
Project planning and coordination	<p>NOS would internally coordinate the location and timing of a given project, wherever possible, to ensure that areas are not repeatedly surveyed, except as needed to achieve research or monitoring goals.</p> <p>NOS would not perform surveys on or near ongoing Navy exercises.</p>
<b>General Area Restrictions for Vessel and Vehicle Movement</b>	
Entry into North Atlantic right whale critical habitat	Report into the Mandatory Ship Reporting System.
Before proceeding with operations onboard a vessel 20 meters (m) (65 feet [ft]) or longer in any North Atlantic right whale seasonal management areas, when those areas are active. See maps and coordinates at <a href="https://www.fisheries.noaa.gov/national/angered-species-">https://www.fisheries.noaa.gov/national/angered-species-</a>	<p>Maintain a vessel speed of 10 knots or less.</p> <p>Check with various communication media for general information regarding avoiding ship strikes and specific information regarding North Atlantic right whale sighting locations. These include NOAA weather radio, United States (U.S.) Coast Guard Navigational Telex (NAVTEX) broadcasts, the WhaleAlert app (<a href="http://www.whalealert.org">www.whalealert.org</a>), and Notices to Mariners.</p>

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Triggering Event	Crew Response
<a href="#">conservation/reducing-vessel-strikes-north-atlantic-right-whales#:~:text=PDF%2C%201197%20page%20Vessel%20Speed%20Restrictions,endangered%20North%20Atlantic%20right%20whales</a>	
Transit areas cross North Pacific right whale critical habitat	Avoid transit through North Pacific right whale critical habitat. For unavoidable transits, vessels must maintain a speed of 10 knots or less.
Entry into Rice's whale areas (Core Distribution Area [CDA] and the 100 m to 400 m isobath in the Gulf of Mexico)	a. Minimize all transits b. Do not exceed 10 knots c. Do not enter at night. If vessels are present in the CDA/isobath at night, the vessel must be anchored, moored, or otherwise immobile.
Use of High Resolution Geophysical (HRG) sources in all areas north of the Forelands in Cook Inlet, Alaska. HRG surveys are defined as surveys using an electromechanical source that operates at frequencies less than 180 kilohertz (kHz), other than those defined at § 217.184(c)(1) (i.e., side-scan sonar, multibeam echosounder, or CHIRP sub-bottom profiler) per the 2020 Bureau of Ocean Energy Management (BOEM) Biological Opinion (BiOp) on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico	The Forelands in Cook Inlet are described as 60°43'10.9"N 151°24'35.8"W (east side of the Inlet, Nikiski, AK) and West Foreland (60°42'48.1"N 151°42'38.3"W). For dedicated mapping and surveying work north of this area (i.e., a specific project involving the use of echo sounders), contact the Alaska Region (akr.prd.section7@noaa.gov) for instructions on how to proceed.

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Triggering Event	Crew Response
Entry into sensitive Steller sea lion areas	Maintain a vessel separation distance of 3 nautical miles (nm) from Steller sea lion critical habitat, rookeries listed in 50 Code of Federal Regulations (CFR) 223.202, and other haulouts/rookeries as observed during operations. In areas of mandated charting, contact <a href="mailto:akr.prd.section7@noaa.gov">akr.prd.section7@noaa.gov</a> on how to proceed.
Entry into sturgeon and sawfish critical habitat as shown at <a href="https://www.fisheries.noaa.gov/resource/map/atlantic-sturgeon-critical-habitat-map-and-gis-data">https://www.fisheries.noaa.gov/resource/map/atlantic-sturgeon-critical-habitat-map-and-gis-data</a> <a href="https://www.fisheries.noaa.gov/resource/map/smalltooth-sawfish-critical-habitat-map-and-gis-data">https://www.fisheries.noaa.gov/resource/map/smalltooth-sawfish-critical-habitat-map-and-gis-data</a> <a href="https://data.noaa.gov/dataset/dataset/green-sturgeon-critical-habitat-gis-data1">https://data.noaa.gov/dataset/dataset/green-sturgeon-critical-habitat-gis-data1</a>	All vessels in coastal waters will operate in a manner to minimize propeller wash and sea floor disturbance, and transiting vessels should follow deep-water routes (e.g., marked channels), as practicable, to reduce disturbance to sturgeon and sawfish critical habitat.
Vessel Movement Restrictions	
In-water seals or sea lions are identified within 91 m (100 yards [yd]) of the vessel	Avoid approaching within 91 m (100 yd) of in-water seals and sea lions.
An Endangered Species Act (ESA)-listed whale is identified within 457 m (500 yd) of the forward path of the vessel	All vessels must steer a course that increases the distance from the whale at a speed of 10 knots or less until the 457 m (500 yd) minimum separation distance has been established.
An ESA-listed whale is sighted within 91 m (100 yd) 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 457 m (500 yd). If stationary, the vessel must not engage engines until the large whale has moved beyond 457 m (500 yd). A single cetacean at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should always be exercised.
One or more cetaceans (whales, dolphins, or porpoises) are sighted while a vessel is underway	Attempt to remain parallel to the animal's course if feasible. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area.

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Triggering Event	Crew Response
One or more sea turtles are sighted while the vessel is underway	Attempt to maintain a distance of 45 m (50 yd) or greater whenever possible.
Night time vessel operation	Vessel operators on project vessels operating at night will use the appropriate lighting to comply with navigation rules and best safety practices. All project areas will be continually monitored for protected species by posted crewmembers during vessel operations.
<b>Reporting Requirements</b>	
Sighting of any injured, dead, or entangled right whales	Report sighting immediately to the U.S. Coast Guard via VHF Channel 16.
Sighting of any injured, dead, or entangled ESA-listed species	Immediately report to National Marine Fisheries Service (NMFS) using the contact information at <a href="https://www.fisheries.noaa.gov/report">https://www.fisheries.noaa.gov/report</a> . NMFS also has created a <a href="#">Dolphin &amp; Whale 911</a> telephone app that can be used to direct calls to the nearest stranding response helpline.
Sightings of critically endangered cetaceans including North Atlantic right whale, North Pacific right whale, Southern Resident killer whale, Main Hawaiian Island insular false killer whale, and Rice's whale	Report sighting within two hours of occurrence when practicable and no later than 24 hours after occurrence to <a href="https://www.fisheries.noaa.gov/report">https://www.fisheries.noaa.gov/report</a> . Right whale sightings in any location may also be reported to the U.S. Coast Guard via VHF channel 16 and through the WhaleAlert App: <a href="https://www.whalealert.org/">https://www.whalealert.org/</a> .
<b>Discharge Restrictions</b>	
Sighting of any protected marine species within 91 m (100 yd) of the vessel	Do not discharge.
Operating or maintaining a vessel	Follow the International Convention for the Prevention of Pollution from Ships (MARPOL) discharge protocols.
	Meet all Environmental Protection Agency (EPA) Vessel General Permits and Coast Guard requirements.
	Use anti-fouling coatings.
	Clean hull regularly to remove aquatic nuisance species.
	Avoid cleaning of hull in critical habitat.
	Avoid cleaners with nonylphenols.

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Triggering Event	Crew Response
<b>Restrictions on Instrument / Autonomous System Deployment</b>	
Sighting of any protected marine species within 91 m (100 yd) of the work area	Suspend deployment of all instruments, divers, and autonomous systems. Work already in progress may continue if that activity is not expected to adversely affect the animal(s).
Autonomous Underwater Vehicle (AUV) operation	Equipment such as AUVs would be programmed and operated to avoid sea floor disturbance.
Bottom sampling for sediment verification	NOS would not collect bottom samples for sediment verification on coral reefs, shipwrecks, obstructions, or hard bottom areas.
Instrument Deployment	NOS would ensure that all instruments placed in contact with the sea floor are properly secured to minimize bottom disturbance. NOS would use retrievable instruments, when possible, to avoid abandoning deployed equipment on the sea floor.
Anchoring	Do not anchor in coral critical habitat or other known areas of coral.
	Avoid anchoring in abalone habitat as defined at <a href="https://media.fisheries.noaa.gov/2022-05/ch_2021mapseries_AbaloneBlack.jpg">https://media.fisheries.noaa.gov/2022-05/ch_2021mapseries_AbaloneBlack.jpg</a>
	Avoid anchoring in seagrass.
	Vessel operators would not drag anchor chains.  Vessel operators would select the anchor location based on depth, protection from seas and wind, and bottom type. Preferred bottom types are sticky mud or sand, as those characteristics allow the flukes of the anchor to dig into the bottom and hold the chain in place. When working in an un-surveyed area or in an area that has not been surveyed in many years, the ship would try to anchor in bays where data have already been collected, providing the ship with better information on where to drop the anchor.
Equipment/Autonomous Systems Deployment	Stiffer line materials should be used for towing and kept taut during operations to reduce the potential for entanglement in bottom features such as coral habitats and shipwrecks.
<b>SCUBA / Snorkeling Restrictions</b>	
When using a boat or platform to conduct self-contained underwater breathing apparatus (SCUBA) or snorkeling operations	At least one person should maintain a visual watch for mobile protected species to ensure none are sighted within the working area. If a listed species moves into the area of work, cessation of operation of any moving equipment within 15 m (50 ft) of the animal should occur. Activities may resume once the species has departed the project area of its own volition.

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Triggering Event	Crew Response
Diving on or near coral	Divers/snorkelers/swimmers should not stand or rest on live corals/coral reefs. Bottom contact should only be in unconsolidated areas or non-living hardbottom.
At all times during SCUBA or snorkel operations	SCUBA divers/snorkelers involved in in-water activities should have proper training and be capable of responsible dive/snorkel practices (e.g., proper buoyancy) such that they minimize injury to organisms, avoid unnecessary habitat impacts, and avoid injury to sensitive archaeological materials. It is the responsibility of NOAA or grantees/contractors to ensure that divers/snorkelers are trained to a level commensurate with the type and conditions of the diving activity being undertaken. Divers shall use appropriate dive equipment and tools, expert boat anchoring (e.g., hand placement by divers/snorkelers on verified non-living bottom habitat before deployment), and have diver awareness. The organization must have the capacity (appropriate insurance, safety policies, etc.) to oversee all proposed diving/snorkeling activities. SCUBA divers will avoid inadvertent disturbance to the sea floor.
<b>Restrictions on Buoy Deployment, Maintenance, and Retrieval</b>	
At all times during buoy deployment, maintenance, or retrieval of a buoy	Ensure that any buoys attached to the sea floor use the best available mooring systems. 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. 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. When possible, field crews should use retrievable equipment to avoid abandoning material on the sea floor.
	During all buoy deployment and retrieval operations, buoys should be lowered and raised slowly to minimize risk to listed species and benthic habitat. Additionally, PSOs or trained project personnel (if PSOs are not required) should monitor for listed species in the area prior to and during deployment and retrieval and work should be stopped if listed species are observed in the area to minimize entanglement risk.
	All buoys must be properly labeled with owner and contact information.

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Triggering Event	Crew Response
A live or dead marine protected species becomes entangled in buoy lines	Immediately contact the applicable NMFS stranding coordinator; contact information is available at: <a href="https://www.fisheries.noaa.gov/report">https://www.fisheries.noaa.gov/report</a> . Provide any on-water assistance requested. NMFS also has created a <u>Dolphin &amp; Whale 911</u> telephone app that can be used to direct calls to the nearest stranding response helpline.
<b>Vessel Operation</b>	
Operating vessels in polar bear habitat	Ensure that vessels maintain a 1.6 kilometer (km) (1 mile [mi]) separation distance from polar bears observed on ice, land, or water.
	Be alert to potential presence of polar bears, visually monitor the area and adjacent waters. Be especially vigilant for swimming bears. If a swimming bear(s) is encountered, allow it to continue unhindered. Never approach, herd, chase, or attempt to lure swimming bear(s). Reduce speed when visibility is low and avoid sudden changes in travel direction.
	Navigate slowly, steer around polar bears, and do not approach, circle, pursue, or otherwise force bears to change direction when observed in the water.
	Avoid multiple changes in direction and speed and do not restrict bears' movements on land or sea.
Operating vessels in Pacific walrus habitat	Do not conduct activities within 1.6 km (1 mi) of known or suspected polar bear dens.
	Maintain an appropriate minimum distance from walrus hauled out on ice or land: Marine vessels less than 15 m (50 ft) in length – 1 km (0.5 nm); Marine vessels 15 m or more but less than 30 m (100 ft) in length – 1.8 km (1 nm); and Marine vessels 30 m (100 ft) or more in length – 5.5 km (3 nm).
	Reduce noise levels near haulouts. Avoid abrupt maneuvers, sudden changes in engine noise, using loud speakers, loud deck equipment, or other operations that produce noise when in the vicinity of walrus haulouts. Note that sound carries a long way across the water and often reverberates off of cliffs and bluffs adjacent to coastal walrus haulouts, amplifying noise. Do not operate the vessel in such a way as to separate members of a group of walrus from other members of the group.
Reduce speed and maintain a minimum distance of 0.8 km (0.5 mi) from groups of walrus in the water.	



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Triggering Event	Crew Response
	If walrus approach the vessel or are found to be in close proximity, place boat engines in neutral and allow the animals to pass. If vessel safety considerations prevent this, carefully steer around animals. When weather conditions require, such as when visibility drops, adjust speed accordingly to avoid the likelihood of injury to walrus.
Operating vessels in northern sea otter habitat	Do not operate vessels in such a way as to separate sea otters from other members of their group. If northern sea otters are observed in groups of fewer than 10 animals, do not approach within 100 m (109 yd). If the group size is greater than 10, do not approach within 500 m (547 yd).
Operating vessels in manatee habitat (U.S. Gulf coast and Atlantic Coast as far north as the Chesapeake Bay)	All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. All crews shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees. All vessels associated with the project shall operate at "Idle Speed/No Wake" at all times while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible. Observe water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shut down if a manatee(s) comes within 15 m (50 ft) of the operation. Activities will not resume until the manatee(s) has moved beyond the 15-m (50-ft) radius of the vessel, or until 30 minutes elapses if the manatee(s) has not reappeared within 15 m (50 ft) of the vessel. Animals must not be herded away or harassed into leaving. Any collision with or injury to a manatee shall be reported immediately. To report dead, debilitated, or distressed manatees, call 1-877-WHALE HELP (1-877-942-5343). NOAA Fisheries also has created a <a href="#">Dolphin &amp; Whale 911</a> telephone app that can be used to direct calls to the nearest stranding response helpline.
<b>Aircraft / UAS Operation</b>	
Flying aircraft above Alaska waters and shorelines	Maintain an altitude of at least 305 m (1,000 ft) when flying over northern sea otters. Maintain an altitude of at least 457 m (1,500 ft) when flying within 805 m (0.5 mi) of polar bears.

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Triggering Event	Crew Response
Operating crewed aircraft in polar bear areas.	Unless taking off from or landing at an airport/airstrip, pilots should maintain a minimum of 457 m (1,500 ft) flight altitude and 0.8-km (0.5-mi) horizontal distance from polar bears in the water, and on ice or land. Avoid circling or turning aircraft near polar bears.
Operating aircraft near walrus haulout (Aircraft guidelines to reduce likelihood of walrus take)	Do not fly autonomous system devices or single engine fixed wing aircraft over or within 0.8 km (0.5 mi) of walruses hauled out on land or ice.
	If weather or aircraft safety require flight operations within 0.8 km (0.5 mi) of a haulout site, maintain a 610 m (2,000 ft) minimum altitude.
	Do not fly helicopters over or within 1.6 km (1 mi) of walruses hauled out on land or ice.
	If weather or aircraft safety require crewed flight operations within 1.6 km (1 mi) of a haulout site, maintain a 915 m (3,000 ft) minimum altitude.
	Landings, take-offs, and taxiing of autonomous system devices or single engine fixed wing aircraft should not occur within 0.8 km (0.5 mi) of hauled out walruses, or within 1.6 km (1 mi) for helicopters.
	Avoid circling or turning near walruses hauled out on land or ice. If aircraft safety requires flight operations below recommended altitudes near a haulout, pass inland or seaward of the haulout site at the greatest lateral distance manageable for safe operation of the aircraft.
<b>Shore Party Activities</b>	
Operating on land in polar bear areas	Avoid polar bears on land, ice, and water. Conduct activities at the maximum distance possible from polar bears.
	Be prepared. Have a human-bear safety plan that includes information on how to avoid and respond to bear encounters. Carry deterrents, and practice/know how to use them.
	Avoid surprise encounters. Travel in groups, make noise, and be vigilant - especially on barrier islands, in river drainages, along bluff habitat or ice leads/polynyas, near whale or other marine mammal carcasses, or in the vicinity of fresh tracks.
	Minimize attractants. Avoid carrying strongly scented attractants such as meat or fish while away from camp, or place them in air-tight containers to minimize odor transmission.

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Triggering Event	Crew Response
	<p>Avoid disturbing denning bears. Between November and April, special care is needed to avoid disturbance of denning bears. If activities are to take place during that time period, U.S. Fish and Wildlife Service (USFWS) should be contacted to determine if any additional mitigation is required. In general, activities are not permitted within one mile of known den sites.</p>
<p>If a polar bear is encountered</p>	<p>Prepare deterrent(s). Do not run from or approach polar bears. If the bear is unaware of you, allow it to continue what it was doing before you encountered it. Move to safe shelter (e.g., vehicle or building) if available, and wait until it is safe to proceed.</p> <p>Group up. If no safe shelter is available, group up with others and stand positioned to allow for safe deployment of deterrents (e.g., firearm, pistol launcher, bear pepper spray) – until the bear leaves.</p> <p>Observe bear behavior. Polar bears that stop what they are doing to turn their head or sniff the air in your direction have likely become aware of your presence. These animals may exhibit various behaviors: 1) Curious polar bears typically move slowly, stopping frequently to sniff the air, moving their heads around to catch a scent, or holding their heads high with ears forward. They may also stand up. 2) A threatened or agitated polar bear may huff, snap its jaws together, stare at you (or the object of threat) and lower its head to below shoulder level, pressing its ears back and swaying from side to side. 3) A predatory bear may sneak up on an object it considers prey. It may also approach in a straight line at constant speed without exhibiting curious or threatened behavior.</p>
<p>If a polar bear approaches</p>	<p>Defend your group. Any bear that approaches within range of your deterrents should be deterred. Stand your ground; do not run. Defend your group, increasing the intensity of your deterrence efforts as necessary. Be aware that lethal take of polar bears is permissible if such taking is imminently necessary in defense of human life. Defense of life kills must be reported to the USFWS within 48 hours.</p> <p>If a bear makes physical contact, fight back. If deterrence/lethal efforts have failed and a polar bear attacks (i.e., makes physical contact), do not “play dead”. Fight back using any deterrents available, aiming fists or objects at the bear’s nose and face.</p>

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Triggering Event	Crew Response
<b>Tide Gauge Installation</b>	
Tide gauge installation projects taking place along the shorelines in manatee habitat (U.S. Gulf coast and Atlantic Coast as far north as the Chesapeake Bay)	Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
	All personnel associated with the project shall be instructed about the presence of manatees. All crews shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees.
	All project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shut down if a manatee(s) comes within 15 m (50 ft) of the operation. Activities will not resume until the manatee(s) has moved beyond the 15-m (50-ft) radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 15 m (50 ft) of the operation. Animals must not be herded away or harassed into leaving.
	Any collision with or injury to a manatee shall be reported immediately. To report dead, debilitated, or distressed manatees, call 1-877-WHALE HELP (1-877-942-5343). NOAA Fisheries also has created a <a href="#">Dolphin &amp; Whale 911</a> telephone app that can be used to direct calls to the nearest stranding response helpline.
	Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed upon completion of the project. One sign which reads "Caution: Boaters" must be posted. A second sign measuring at least 8 ½" by 11" explaining the requirements for "Idle Speed/No Wake" and the shutdown of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities.