

Chapter 5: Environmental Consequences

This chapter evaluates the environmental consequences of the proposed range of alternatives. NOAA evaluated the environmental consequences of the proposed action within the context of the physical, biological, human and socioeconomic, historical, and cultural settings within the sanctuary, as described in **Chapter 4**. The environmental consequences of the no action alternative (A) and both action alternatives (B and C) are summarized in **Section 5.7**.

5.1 Framework of Impacts Analysis

5.1.1 Summary of Analyzed Actions

Table 5 provides a summary of the proposed management plan activities, field activities, and regulatory changes that would take place under alternatives A, B, and C. These actions are described in detail in **Chapter 3** and their impacts are analyzed further in **Sections 5.2 to 5.6**.

NOAA determined that several proposed management plan activities and regulatory changes would not impact the environment because they are purely administrative in nature, do not require any routine field operations, would occur within existing facilities, or no construction or physical development would occur. These types of activities are not further analyzed in this EA. These actions include:

- Office and classroom-based activities (conducting meetings, policy development and planning, risk assessments, education and training programs, preparing research reports, and producing and maintaining online resources and databases);
- Administration of the sanctuary (performing budgeting, staffing, information technology support, and providing support to the MBNMS Advisory Council);
- Permitting administration (processing permit applications and authorizations, monitoring permit compliance, and using the sanctuary's permitting authority to reduce negative impacts from introduced species, marine debris, and wildlife disturbance); and
- Technical correction to the MBNMS regulations to correct a previous error and clarify exempted Department of Defense activities in the Davidson Seamount Management Zone.

Table 5. Summary of Actions Analyzed in Chapter 5

Action	Alternative Component	Alternatives that include this action		
		A	B	C
Operating and maintaining ONMS vessels	Field Operation	✓	✓	✓
SCUBA and snorkel operations	Field Operation	✓	✓	✓
Onshore fieldwork	Field Operation	✓	✓	✓
Operations of non-motorized craft	Field Operation	✓	✓	✓
Deployment of equipment on the seafloor	Field Operation	✓	✓	✓
Deployment of autonomous underwater vehicles, remotely operated vehicles, gliders, and drifters	Field Operation	✓	✓	✓
Aircraft operations	Field Operation	✓	✓	✓
Education and outreach activities at existing facilities, within sanctuary waters or along adjacent shorelines	Management Plan Activity	✓	✓	✓
Coordination and collaboration with local and regional partners and stakeholders on research, resource protection, and other sanctuary management topics	Management Plan Activity	✓	✓	✓
Research, sampling, and monitoring activities within the sanctuary or along adjacent shorelines	Management Plan Activity	✓	✓	✓
Resource protection and stewardship activities within the sanctuary or along adjacent shorelines	Management Plan Activity	✓	✓	✓
Maritime heritage activities to implement MBNMS' maritime heritage program	Management Plan Activity	✓	✓	✓
Beneficial use of dredged material definition (new) and clarification (proposed update)	Regulatory Change			✓
Access to motorized personal watercraft zone at Mavericks surf break (proposed update)	Regulatory Change			✓
Motorized personal watercraft zone boundary changes (proposed update)	Regulatory Change			✓

5.1.2 Approach to Impact Analysis

Analysis of the environmental consequences of alternatives A, B, and C is based on review of existing literature and studies, information provided by experts, and the best professional judgment of NOAA staff. NOAA relied in part on the analysis of impacts of routine field activities at MBNMS described in its Programmatic EA for Field Operations, as well as both the final EIS prepared for the 2008 Joint Management Plan Review, and the 2015 Condition Report. The environmental consequences of the proposed action are considered within the context of the five- to 10-year timeline for implementing the revised sanctuary management plan. Thus, when assessing the effects of an action, the action is presumed to occur for up to 10 years.

NOAA considered the following types of impacts that could result from the proposed action:

- **Direct impact:** A known or potential impact which is caused by the action and occurs at the same time or place (40 CFR § 1508.8(a)).
- **Indirect impact:** A known or potential impact which is caused by the action and is later in time or farther removed in distance, but is still reasonably foreseeable (40 CFR § 1508.8(b)).
- **Cumulative impact:** The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR § 1508.7).

The potential direct and indirect impacts associated with the proposed action and alternatives are described by their significance (negligible, less than significant, significant) and by their quality (beneficial or adverse), as described below. Cumulative impacts from other past, present, and reasonably foreseeable future actions are described in **Section 5.6**.

Significance of Potential Impacts

To determine whether an impact is significant, the Council on Environmental Quality (CEQ) regulations (40 CFR § 1508.27) and NOAA guidance (NAO 216-6A) require the consideration of context and intensity of potential impacts.

Context is the setting within which an impact is analyzed, such as the affected region or locality and the affected interests. In this EA, NOAA evaluated the direct and indirect impacts within a local context, primarily examining how each alternative would affect the human environment within a specified portion of the sanctuary, and whether those effects would be short-term or long-term. The geographic area of interest for cumulative impacts is a slightly broader regional context in order to consider overlapping and compound effects with other past, present, or reasonably foreseeable future actions.

Level of **intensity** refers to the severity of the impact. The various levels of impact used in this analysis are:

- **Negligible:** Impacts to a resource can barely be detected (whether beneficial or adverse) and are therefore discountable.

- **Less than significant:** Minor impacts that do not rise to the level of significant as defined below.
- **Significant:** Impacts resulting in an alteration in the state of a biological, physical, cultural and historical, or socioeconomic resource. Long-term or permanent impacts or impacts with a high intensity or frequency of alteration to a resource, whether beneficial or adverse, would be considered significant. The significance threshold is evaluated on a case-by-case basis, taking into consideration the context and intensity of each action.

Quality of Potential Impacts

Potential impacts are described as either beneficial or adverse as follows:

- **Beneficial impact:** Impacts that promote favorable conditions for the resource.
- **Adverse impact:** Adverse impacts are considered contrary to the goals, objectives, management policies, and practices of NOAA and the public interest or welfare. These impacts are likely to be damaging, harmful, or unfavorable to one or more of the resources.

5.1.3 Structure of the Environmental Consequences Analysis

Sections 5.2 to 5.6 evaluate the impacts of the alternatives on the resource areas described in **Chapter 4**. NOAA evaluated the impacts within the context of each of the following alternative components, as described in **Chapter 3**: field activities, the sanctuary management plan, and sanctuary regulations. In evaluating these impacts, NOAA considered the following questions:

- How do the activities proposed to operate MBNMS affect the resources, natural environment, and human uses in and around the sanctuary?
- How do the activities proposed to manage MBNMS affect the level of protection of the sanctuary's resources and public stewardship of these resources?
- How do the type and amount of regulations to protect sanctuary resources affect the natural environment and human uses in and around the sanctuary?

NOAA evaluated and considered the impacts specific to each alternative, as summarized below.

Impacts from Alternative A (No Action Alternative): **Section 5.2** describes the impacts from the no action alternative (Alternative A) whereby NOAA would continue to operate and manage MBNMS under the current regulations, sanctuary management plan, and routine field activities.

Impacts from Alternative B: **Section 5.3** describes the impacts from Alternative B whereby NOAA would continue to manage MBNMS under the current regulations and field activities, and revise the sanctuary management plan to respond to current threats to sanctuary resources and increase public involvement and outreach.

Impacts from Alternative C: **Section 5.4** describes the impacts from Alternative C whereby NOAA would continue to manage MBNMS by conducting routine field activities, revising and adding new regulations to protect sanctuary resources, and updating the sanctuary management plan to respond to current threats to sanctuary resources and increase public involvement and outreach.

Impacts on Protected Species and Habitats: **Section 5.5** describes the impacts of managing and operating the sanctuary on species and habitats protected under the Endangered Species Act (ESA), and Essential Fish Habitat (EFH) protected under the Magnuson–Stevens Fishery Conservation and Management Act (MSA). These impacts are common to all alternatives considered.

Cumulative Effects Analysis: **Section 5.6** describes the cumulative effects from other past, present, and reasonably foreseeable activities on each of the alternatives.

5.2 Impacts of Alternative A (No Action Alternative)

This section describes the impacts on the resource areas and human uses in and around the sanctuary that would occur under Alternative A (no action alternative). Under the no action alternative, NOAA would continue to conduct field activities and management plan activities, and implement existing sanctuary regulations to protect and manage sanctuary resources.

5.2.1 Impacts on the Physical Setting (No Action Alternative)

This section describes the impacts on the physical setting from implementing routine field activities, the 2008 sanctuary management plan, and existing sanctuary regulations. The components of the no action alternative are described in detail in **Sections 3.2.1, 3.3.1, and 3.4**. An overview of the sanctuary’s physical setting is provided in **Section 4.1**.

5.2.1.1 Beneficial Impacts on the Physical Setting (No Action Alternative)

Existing sanctuary regulations would continue to limit discharges into the sanctuary that could compromise water quality and restrict prohibited activities. Implementing these regulations would further protection of important habitat and physical resources in MBNMS.

As part of implementing the current sanctuary management plan through routine field activities, research and monitoring programs provide sanctuary managers with information to inform decisions related to resource protection. In addition, education and outreach activities would further the public’s understanding of the importance of ocean stewardship and protection of sanctuary resources. This could result in changes in behavior and decision-making of individuals, communities, organizations, and agencies in ways that could indirectly benefit physical resources within the sanctuary. Further, implementing resource protection and emergency response activities would remove hazards from the waters of MBNMS, thus avoiding seafloor disturbance or hazardous spills that could result in adverse impacts. Monitoring of potentially polluting shipwrecks would result in early notification of potential hazardous leaks. Implementation of mitigation helps to avoid potential adverse impacts to water quality. Additionally, implementing the agriculture healthy soils program supports management practices that add carbon to agricultural lands, which can benefit the soil and pasture health, landscape appearance, and working conditions on animal production ranches while simultaneously removing carbon from the atmosphere by storing it in soil and plant structures. This carbon sequestration can diminish the negative effects of increasing levels of atmospheric carbon dioxide on MBNMS, which includes ocean warming, sea level rise, current circulation, ocean acidification, and the effects these factors have on marine ecosystems and organisms.

These **beneficial** impacts to the physical setting from the no action alternative would be **less than significant** because the scope and intensity of current sanctuary management activities are not large enough to result in significant, permanent changes to the physical setting of MBNMS.

5.2.1.2 Adverse Impacts on the Physical Setting (No Action Alternative)

Under the no action alternative, some minor adverse impacts to the physical setting would result from conducting routine field activities and other management activities. Adverse impacts from these activities are described below.

Operating and Maintaining ONMS Vessels

Routine vessel operations can have adverse effects on physical resources within MBNMS, particularly water quality, the acoustic setting, air quality, and seafloor sediment. Normal vessel operations can occasionally require anchoring which results in seafloor disturbance and temporary increases in turbidity. Very rarely, vessel accidents can result in sinkings or groundings that cause larger disturbance of the seafloor, coastal beaches, and physical habitat and risk longer-term negative impacts on water quality through leaks of hazardous substances (e.g., fuel, lubricant, sewage, and garbage). Vessel operations could also have adverse impacts on the acoustic setting within MBNMS due to movement of vessels through water, the operation of propulsion machinery, and the use of depth sounders. Vessels emit air pollutants from engines and generators on board, including carbon dioxide, which can result in reduced local air quality.

MBNMS-led vessel operations would occur infrequently (up to 90 days at sea on three vessels up to 65 feet in length). Relative to the scale of existing vessel traffic in this region, including ambient acoustics and background noise and seafloor anchoring, the additional impacts of vessels used to support sanctuary management is expected to be minor. All ONMS vessels must comply with the operational protocols and procedures in the NOAA Small Boats Policy (NAO 209-125) and ONMS best management practices as detailed in **Appendix C**. These best management practices include a requirement to limit vessel anchoring to sandy-bottom substrates to avoid damage to seagrasses and coral habitat. Further, existing state, federal, and sanctuary regulations prohibit most intentional discharges, therefore direct impacts to water quality from vessel operations are expected to be highly unlikely because they would only occur from accidental discharge.

Operating vessels requires routine vessel maintenance. Vessel maintenance could result in decreased water quality if contaminants used to maintain boats (e.g., oil and cleaning chemicals) inadvertently enter sanctuary waters. For ONMS vessels used by MBNMS staff, this routine maintenance is generally conducted by trained NOAA personnel or contractors in Monterey Harbor. Heavy maintenance is typically accomplished on land in self-contained contractor facilities which are highly regulated for industrial safety and environmental compliance by local, state, and federal entities. Where possible, bio-based lubricants and fluids (and in some cases bio-based fuels) are used, further reducing the threat to water quality resources in the unlikely event of a spill. Because most vessel maintenance activities are conducted outside MBNMS and by highly-trained staff, the risk of contaminants entering sanctuary waters is extremely low.

Overall, the **adverse** impacts of vessel operations and maintenance on air quality, water quality, seafloor substrate, and the acoustic setting within MBNMS would be **less than significant** because of the low intensity and frequency of vessel operations and maintenance within MBNMS, and adherence to regulations and best management practices that would minimize seafloor disturbance and leaks from vessels.

Scuba and Snorkel Operations

Normal scuba and snorkel operations can have adverse effects on physical resources during dives due to disturbance of seafloor sediments and temporary increases in turbidity. Scuba and snorkel operations do not involve discharge therefore there is no further risk to water quality beyond increased turbidity. Overuse of specific locations may result in larger or longer-term disturbance of sediments.

NOAA conducts up to 250 dives per year to support habitat, species and oceanographic studies, natural resource damage assessments, and locating and characterizing cultural and maritime heritage resources. During these activities, dive site location often varies by project, and therefore prevents overuse of any specific location. Further, MBNMS divers and snorkelers are highly trained and avoid harming or disturbing physical resources. Compared to the effects of natural water motion and seafloor disturbances from currents, waves, and storms, the infrequent NOAA scuba and snorkel activities are minor. Overall, scuba and snorkel operations are expected to result in minor **adverse** effects on water quality and geological resources within MBNMS that are **less than significant** because of the low intensity and frequency of scuba and snorkel operations within MBNMS.

Deployment of Equipment on the Seafloor

Deployment of equipment on the seafloor can cause minor adverse impacts to physical resources in MBNMS through temporary or long-term disturbance of sediments and physical habitat. NOAA deploys buoy-based scientific equipment for research and monitoring, mooring buoys for marking zone boundaries for motorized personal watercraft use, hydrophones, and oil spill response booms. All of these require deployment of mooring hardware on the seafloor, which can range from weighted moorings systems to screw anchors that go below the marine substrate. When conducting such deployments, MBNMS staff implement ONMS best management practices to mitigate damage to the seafloor that include: deploying instruments onto sandy substrate whenever possible; deploying instruments slowly and under constant supervision; and conducting a visual survey of the seafloor prior to deployment of equipment to avoid sensitive areas. Compared to the entire seafloor area of the sanctuary, the areas impacted by research equipment and MBNMS buoys on the seafloor is miniscule. Moreover, the equipment is retrieved, when possible, to download data and because these instruments are often expensive. In general, **adverse** impacts to the seafloor from these deployments would be **less than significant** because the activities are periodic, spread out in space and time, and care is taken when placing equipment to avoid sensitive areas of the seafloor.

Deployment of Autonomous Underwater Vehicles, Remotely Operated Vehicles, Gliders, and Drifters

Deployment of autonomous underwater vehicles, remotely operated vehicles, gliders, or drifters can cause adverse impacts to physical resources through unintentional collision with the seafloor or accidental groundings, and temporary disturbance of the acoustic environment due to minor engine noise and use of operational altimeters. The operations of such equipment within MBNMS would be periodic and low intensity (i.e., up to 40 ROV deployments per year¹¹), and would usually support response to vessel casualties and associated assessments of resource damage, characterizing seafloor habitats and ecologically significant areas, and visual reconnaissance surveys associated with historic documentation on last reported positions of ship and aircraft wreck sites. If a vehicle were to accidentally or intentionally collide with the seafloor, the impacts would likely be the same as those described above for vessel anchoring or deployment of equipment on the seafloor. Due to the low intensity of anticipated operations of these types of vehicles, the low likelihood of a collision or grounding, and best management practices to mitigate seafloor impacts, the **adverse** impacts to the physical setting would be **negligible**.

Operations of Non-Motorized Craft

Routine operations of non-motorized craft would have **no adverse effect** on the physical setting in MBNMS. Sanctuary staff and volunteers use kayaks to conduct on the water outreach to recreational and commercial operators in the sanctuary. Kayaks are small, lightweight, slow, and maneuverable, and therefore are generally not capable of inflicting damage on geological features, sediment, or altering oceanographic features. In addition, non-motorized craft do not discharge any substance or produce air emissions or engine noise, and therefore are expected to have **no adverse effect** on water quality, air quality, seafloor substrate, or the acoustic environment.

Onshore Fieldwork

Onshore fieldwork can have adverse effects on physical resources through disturbance of sediments and physical habitat in the intertidal zone and coastal watersheds, changes in water quality from accidental leaks or marine debris, and noise impacts from human activities or operation of machinery. NOAA staff and volunteers conduct onshore field work to support educational activities and citizen science efforts. These activities encourage visitation to beaches, intertidal zones, and coastal streams and can cause transient disturbance of physical habitat by increasing human presence in these areas. In addition, MBNMS-led research or response teams operate in the intertidal zone when conducting emergency removal or salvage of sunken or grounded vessels, aircraft, vehicles, and other discharged matter. Salvage or recovery activities can disturb physical habitats when debris is introduced onshore or if it is dragged along the shore or if heavy equipment is required to remove debris. For example, helicopters can occasionally be required to airlift removal of debris in steep coastal areas of the sanctuary. If

¹¹ Some deployments would require a permit or Letter of Authorization from the sanctuary superintendent. Generally, the environmental impacts of those deployments would be evaluated at the time of the permit application.

grounded vessels contain hazardous materials (e.g., fuel), salvage and recovery can rarely result in spills that compromise water quality or cause damage to onshore habitat.

MBNMS-contracted salvors must follow best practices, which includes removal of all fuel and removal of large vessel parts such as engine, tanks, and hull. These best practices reduce the risk of accidental spills or dispersal of debris into the intertidal zone or waters of the sanctuary during emergency response activities. Moreover, NOAA staff and participants in MBNMS-led stewardship, emergency response, education, and research programs are instructed on ways to minimize their impacts on physical habitats, water quality, and the seafloor when conducting onshore fieldwork activities. The **adverse** effects of onshore fieldwork activities on the physical setting would be **less than significant** because the disturbance of physical habitat, sediments, changes in water quality, and noise impacts would be temporary, conducted by small groups of well-trained people, and would occur widely distributed in space and time.

Aircraft Operations

Routine aircraft operations can have adverse effects on physical resources within MBNMS, particularly water quality, the acoustic setting, and sediment disturbance. NOAA would conduct monitoring flights using drones or other unmanned aerial systems to support compliance with sanctuary regulations, characterization of habitats and species, and to aid in creation of education and outreach materials. Normal operations of these equipment can disturb the acoustic setting because of movement through the air and the operation of propulsion machinery. Very rarely, accidents can result in sinkings or groundings that cause disturbance of the seafloor, coastal beaches, and physical habitat, and risk negative impacts on water quality through leaks of hazardous substances (e.g., batteries) or dispersal of marine debris into the marine environment.

In general, projects that rely on aircraft operations in MBNMS are very limited in scope and time frame (up to 40 flight hours per year). In the unlikely event an unmanned aerial system requires an unintentional or emergency landing, care would be taken to ensure minimal impact to the geological environment in MBNMS. Impacts to water quality would be minimal because the systems are sealed and very unlikely to leak fluid or break apart in the case of an emergency landing on water. Similarly, impacts to air quality would be negligible because most unmanned aerial systems are battery operated and do not emit air pollutants.

To avoid the risk of emergency landings, all remote aerial system operators are highly trained and licensed to operate systems prior to use within MBNMS in compliance with Federal Aviation Administration (FAA) regulations and NOAA standing orders. Additionally, there are regulatory overflight zones in MBNMS where flights below 1,000 feet are prohibited. To avoid adverse impacts to the acoustic environment and sensitive habitats and species, NOAA would conduct aircraft operations outside of NOAA-regulated overflight zones¹² and would avoid bird and mammal rookeries.

¹² If the use of a low overflight zone for remote sensing surveying were required, this activity would be individually permitted by MBNMS after individual environmental review and consultation, as necessary, as described in Sections 1.5.3 and 1.5.4.

In sum, aircraft operations would have **negligible adverse** impacts on physical habitat, water quality, and the acoustic environment due to their small size, the infrequency of these operations, the scale of the impacts in relation to the existing soundscape in MBNMS, and compliance with training requirements, overflight zones, and standing orders by aircraft systems operators.

Regulations

Under Alternative A, NOAA would forgo the opportunity to update the sanctuary regulations to address coastal erosion issues and reduce negative impacts of deep-water buoy deployments on the seafloor. **Adverse** impacts of this would include: continued erosion of shoreline habitat and beaches resulting from shoreline construction activities, coastal armoring, sea level rise, and storm activity; and mooring failures of MBNMS buoys that create marine debris and drag along the seafloor causing disturbance of substrates and habitat. These forgone benefits would be **less than significant** in the context of the entire sanctuary because of the relatively small scale of adverse impacts currently occurring in these areas due to coastal erosion and mooring failures.

5.2.2 Impacts on the Biological Setting (No Action Alternative)

This section describes the impacts on the biological setting from implementing routine field activities, the 2008 sanctuary management plan, and existing sanctuary regulations. The components of the no action alternative are described in detail in Sections **3.2.1**, **3.3.1**, and **3.4**. An overview of the sanctuary's biological setting is provided in **Section 4.2**. Impacts on protected species and habitats are described in detail in **Section 5.5**.

5.2.2.1 Beneficial Impacts on the Biological Setting (No Action Alternative)

Existing sanctuary regulations would continue to limit discharges into the sanctuary that could compromise water quality and restrict prohibited activities that might adversely affect biological resources in MBNMS. Implementing these regulations would further the protection of important habitat and living marine resources in MBNMS.

As part of implementing the current sanctuary management plan through routine field activities, research and monitoring programs provide sanctuary managers with information to inform decisions related to protection of habitat for marine species. In addition, education and outreach activities further the public's understanding of the importance of ocean stewardship and protection of the sanctuary's biological resources. For example, interpretive programming like the Team OCEAN program educates kayakers on becoming better stewards of ocean and coastal ecosystems which beneficially influences long-term efforts to protect biological resources, particularly marine mammals, by minimizing disturbance of protected species. These actions could result in changes in behavior and decision-making of individuals, communities, organizations, and agencies in ways that could indirectly benefit biological resources within the sanctuary. Further, implementing resource protection and emergency response activities would remove hazards from the waters of MBNMS, thus avoiding disturbance of important habitats, risk of collisions with turtles or marine mammals, or hazardous spills that could result in adverse impacts to living marine species in the sanctuary. Monitoring of potentially polluting shipwrecks would result in early notification of potential hazardous leaks. Implementation of

mitigation helps to avoid potential adverse impacts to water quality that could harm living marine species that could not easily find alternative suitable habitat.

The **beneficial** impacts to the biological setting from the no action alternative would be **less than significant** because the scope and intensity of sanctuary management activities are not large enough to result in significant, permanent changes to the sanctuary's biological resources.

5.2.2.2 Adverse Impacts on the Biological Setting (No Action Alternative)

Under the no action alternative, some minor adverse impacts on the biological setting would occur from conducting routine field activities and other management activities. Adverse impacts from these activities are described below.

Research, Monitoring, Resource Protection, and Stewardship Activities

Wildlife research, monitoring, and resource protection actions can have adverse impacts on biological resources, particularly biota in the water column, and benthic, intertidal, or subtidal habitats. Actions that could have adverse impacts would typically involve sampling, collection of organisms, or tagging to support collecting data on species, community, and population status, health, and trends. In some cases, actions taken to study biota or habitat, or to respond to emergencies occurring in the sanctuary, can disturb species in the water or intertidal zone and rarely result in injury or death.

MBNMS-led research and monitoring projects may have short-term impacts, such as disturbing habitats and biota while walking in intertidal areas to collect data, or disturbing wildlife while using small boats to ferry scuba divers to study sites. In addition, methods to address introduced species, such as detection, rapid response, monitoring, eradication, and restoration, can have adverse impacts on native species during removal of introduced species or modification of native habitat.

MBNMS personnel are highly-trained to avoid disturbing or otherwise damaging habitat or biota when conducting research, monitoring, and resource protection activities. They implement various best management practices when operating in the water or onshore to minimize impacts to living species and habitats, such as: using trained lookouts during vessel operations to avoid collisions with marine mammals and sea turtles, maintaining safe distances from large whales, limiting anchoring and instrument deployments to sandy substrates, and constantly supervising deployed instruments to minimize risk of collision or entanglement with marine species. Any tagging of marine mammals is conducted under a Marine Mammal Protection Act (MMPA) permit issued by the National Marine Fisheries Service (NMFS).

Due to the implementation of these best management practices by highly trained staff, and the low intensity of these types of activities, **adverse** impacts on the habitats and biota in MBNMS would be **less than significant**.

Operating and Maintaining ONMS Vessels

Routine vessel operations can have adverse effects on biological resources within MBNMS, particularly through compromised water quality, collision risk, or temporary disturbance of species and habitat. The risk of collision with a vessel is higher for sea turtles and large marine mammals because these species move at slower speeds and may not be able to adjust course to

avoid a vessel. Very rarely, vessel accidents can result in sinkings or groundings that can cause larger disturbance of benthic habitat and coastal beaches or injure marine species. These accidents can also reduce water quality through accidental leaks of hazardous substances (e.g., fuel, lubricant, sewage, and garbage) that can cause marine species to abandon habitat in these areas. In addition, noise emitted from vessels during routine operations can distract an organism from its current path or alter behavior paths in a manner that reduces access to food sources. Any such impact is expected to be short-term and would not cause harm to the individual.

MBNMS-led vessel operations would occur infrequently (up to 90 days per year on three ONMS vessels up to 65-feet in length). In addition, ONMS vessels must comply with the operational protocols and procedures in the NOAA Small Boats Policy (NAO 209-125), ONMS best management practices (**Appendix C**), and voluntary sanctuary standing orders. Specifically:

- maintaining dedicated lookouts for marine mammals and sea turtles;
- reducing vessel speeds to a maximum of 10 knots when marine mammals and sea turtles are visible within one nautical mile of the vessels;
- maintaining distance from large whales and sea turtles; and
- implementing additional mitigation measures if nighttime operations are required.

These mitigation measures are designed primarily to minimize impacts on large whales, sea turtles, and sea otters. Further, existing state, federal, and sanctuary regulations prohibit most intentional discharges from vessels in MBNMS, therefore direct impacts to water quality from vessel operations are expected to be highly unlikely because they would only occur from accidental discharge. As such, indirect adverse impacts on biological resources through compromised water quality as a result of accidental discharges are highly unlikely.

Operating vessels requires routine maintenance. Vessel maintenance could result in decreased water quality if contaminants (e.g., oil and cleaning chemicals) inadvertently enter sanctuary waters. Decreases in water quality can reduce available habitat for marine species if the level of contamination is high. For ONMS vessels used in MBNMS, routine maintenance is generally conducted by trained NOAA personnel or contractors in Monterey Harbor. Heavy maintenance is typically accomplished on land in self-contained contractor facilities which are highly regulated for industrial safety and environmental compliance by local, state, and federal entities. Where possible, bio-based lubricants and fluids (and in some cases bio-based fuels) are used, reducing the threat to water quality in the unlikely event of a spill. Because most vessel maintenance activities are conducted outside MBNMS and by highly-trained staff, the risk of contaminants entering sanctuary waters is extremely low. Therefore, it is highly unlikely that routine vessel maintenance would have any detectable effect on marine species and habitats in MBNMS.

Overall, the combination of a limited number of days at sea and small number of vessels decreases the likelihood of **adverse** impacts to biological resources in the sanctuary. The impacts of vessel operations and maintenance on habitats and biota found in MBNMS are expected to be **less than significant** because of the low intensity and frequency of vessel operations and maintenance within MBNMS and adherence to regulations, best management

practices, and standing orders that would minimize risk of interactions with marine species and habitats.

Scuba and Snorkel Operations

Scuba and snorkel operations can have **adverse** effects on biological resources during dives due to temporary disturbance of benthic habitat and species present in the activity area. Scuba and snorkel operations do not involve discharge, therefore there is no risk to marine species through changes in water quality. However, overuse of specific locations can result in larger or longer-term disturbance of benthic habitat and species at these sites. NOAA divers can conduct up to 250 dives per year. Staff conducting scuba and snorkel operations may temporarily affect the behavior of marine mammals and fishes, but this impact is likely short-term and minor (Rhoades et al., 2018). The presence of people in the water attracts some animals and repels others. Minor disturbance of habitat and biota can occur when transiting through the intertidal zone with scuba or snorkel equipment, but this impact is also likely to be short-term and minor.

During these activities, dive site location varies according to different projects throughout MBNMS, therefore preventing overuse of any specific location. In addition, NOAA divers and snorkelers are highly trained and would employ ONMS best management practices to avoid harm or disturbance to biological resources. For example, NOAA personnel maintain a safe distance between themselves and any marine mammals, sea turtles, or other species present. Therefore, the impacts of scuba and snorkel operations on habitats and biota found in MBNMS are **less than significant** because of the low intensity and frequency of scuba and snorkel activities.

Deployment of Equipment on the Seafloor

Deployment of equipment on the seafloor can have minor adverse impacts on biological resources due to temporary or long-term disturbance of benthic habitat and living organisms. NOAA deploys buoy-based scientific equipment for research and monitoring, mooring buoys for marking zone boundaries for motorized personal watercraft use, hydrophones, and oil spill response booms. All of these require deployment of mooring hardware on the seafloor, which can range from weighted moorings systems to screw anchors that go below the marine substrate.

Because virtually all seafloor substrates in the sanctuary host some living organisms, disturbing the seafloor can have minor adverse effects on invertebrate species that may not quickly move away from human activity. The deployment of mooring hardware and scientific instruments can also present a risk of collision or entanglement for marine species. To minimize and mitigate damage to benthic habitat and any biota present, staff implement ONMS best management practices during instrument or mooring hardware deployments, which include:

- maintaining a safe distance between equipment and any marine mammals, sea turtles, or other protected species present;
- deploying instruments onto sandy substrate whenever possible;
- deploying instruments slowly and under constant supervision; and
- conducting a visual survey of the seafloor prior to deployment of equipment to avoid biologically sensitive areas and biota, particularly protected species.

Compared to the entire seafloor area of the sanctuary, the areas impacted by research equipment and buoys is miniscule. Moreover, equipment is retrieved, when possible, to download data and because these instruments are often expensive. In general, **adverse** impacts to the seafloor and biota present in the area from these deployments would be **less than significant** because the activities are periodic, spread out in space and time, and care is taken when placing equipment to avoid biologically sensitive areas of the seafloor.

Deployment of Autonomous Underwater Vehicles, Remotely Operated Vehicles, Gliders, and Drifters

Deployment of autonomous underwater vehicles, remotely operated vehicles, gliders, or drifters can damage benthic habitat and species on the seafloor due to unintentional striking, groundings, and dropping ballast weights on the seafloor. In addition, tethers attached to ROVs can pose an entanglement risk for marine mammals and sea turtles. The operations of such equipment within MBNMS would be periodic and low intensity (i.e., up to 40 ROV deployments per year¹³), and would usually support response to vessel casualties and associated assessments of resource damage, characterizing seafloor habitats and ecologically significant areas, and visual surveys associated with historic documentation on last reported positions of ship and aircraft wreck sites.

Likelihood of entanglement is low because the duration of operations is very limited and all deployed lines would be attended by trained staff keeping lookout for species in the area. If an animal were observed in the vicinity, the deployed vehicle could be quickly retrieved to minimize the risk of a collision or entanglement. If a vehicle were to accidentally or intentionally collide with the seafloor, the impacts to benthic habitat and species on the seafloor would be the same as those described above for vessel anchoring or deployment of equipment on the seafloor. Because of the low intensity of anticipated operations of these types of vehicles, the low likelihood of an accidental collision or grounding, and best management practices to maintain a safe distance between equipment and any marine mammals, sea turtles, or other species present, the **adverse** impacts to the biological setting would be **less than significant**.

Operations of Non-Motorized Craft

Sanctuary staff and volunteers use kayaks to conduct on the water outreach to recreational and commercial operators in the sanctuary. Kayaks can cause temporary disturbance to sea turtles, sea otters, and other marine mammals in the marine environment, which may result in temporary displacement or behavior change. NOAA staff and volunteers use kayaks at sea up to 50 days per year and take steps to minimize this risk by maintaining a safe distance between the craft and any marine mammals or other protected species present. Kayaks are small, lightweight, slow, and maneuverable, and therefore are generally not capable of inflicting damage on any species or habitat beyond temporary disturbance. Kayaks can be quickly maneuvered in order to avoid a direct impact with an organism in the marine environment. Due

¹³ Some deployments would require a permit or Letter of Authorization from the sanctuary superintendent. Generally, the environmental impacts of those deployments would be evaluated at the time of the permit application.

to the nature of this activity, and that kayaks are operated by trained staff and volunteers, the **adverse** impacts to the biological environment would be **negligible**.

Onshore Fieldwork

Onshore fieldwork can have minor **adverse** effects on biological resources through temporary disturbance of plants, invertebrates, algae, fish, and habitats in the intertidal zone and coastal watersheds, changes in water quality from accidental leaks or marine debris, and noise impacts from human activities or operation of machinery.

NOAA staff and volunteers conduct onshore fieldwork to support educational and citizen science efforts. These activities encourage visitation to beaches, intertidal zones, and coastal streams, and can cause transient disturbance of biota and habitat by increasing human presence in these areas. Volunteer beach and water quality surveys occur up to 1200 person days per year. In addition, MBNMS-led research or response teams operate in the intertidal zone when conducting emergency removal or salvage of sunken or grounded vessels, aircraft, vehicles, and other discharged matter. The location of these activities generally changes based on where an accident or emergency occurs, or where monitoring of the intertidal zone is required. Onshore fieldwork related to response to vessel grounding incidents can occur up to 60 person days per year.

Salvage or recovery activities can disturb biota and habitats when debris is introduced onshore or if it is dragged along the shore or if heavy equipment is required to remove debris. For example, contracted helicopters can occasionally be required for airlift removal of debris in steep coastal areas of the sanctuary. Helicopters operating at very low altitudes can cause temporary, localized disturbance of wildlife. These projects are very limited in scope and time frame. If grounded vessels contain hazardous materials (e.g., fuel), salvage and recovery can rarely result in spills that compromise water quality or cause damage to onshore or nearshore habitat for intertidal species. Impacts to wildlife in these areas from onshore activities is generally a short-term physical or sound disturbance or small-scale trampling of sessile organisms.

NOAA-contracted salvors must follow best practices, which includes removal of all fuel, and removal of large vessel parts such as engine, tanks, and hull. These best practices reduce the risk of accidental spills or dispersal of debris into the intertidal zone or waters of the sanctuary during emergency response activities. These best practices also avoid or minimize the risk of disturbing habitat or crushing biota present in the intertidal zone during salvage. Moreover, NOAA staff and participants in stewardship, emergency response, education, and research programs are instructed on ways to minimize their impacts on intertidal habitats, living organisms, and water quality when conducting onshore fieldwork activities in order to avoid any permanent damage. For example, during the annual Snapshot Day event each spring, volunteers are trained to properly clean their shoes or boots before leaving sites where there are concerns of potentially transporting invasive species between monitoring locations in different watersheds.

Overall, the impacts of onshore fieldwork activities on habitats and biota would be **less than significant** because any disturbance or changes in water quality would be temporary, and activities would be short in duration, occur widely distributed in space and time, and would be conducted by small groups of well-trained staff and volunteers.

Aircraft Operations

Routine aircraft operations can have adverse effects on biological resources within MBNMS through temporary behavioral disturbance from aircraft noise. NOAA would conduct monitoring flights using drones or other unmanned aerial systems to support compliance with sanctuary regulations, characterization of habitats and species, and to aid in creation of education and outreach materials. Very rarely, accidents can result in sinkings or groundings that cause disturbance of seafloor habitat and coastal beaches, or reduce habitat availability through leaks of hazardous substances (e.g., batteries) or dispersal of marine debris into the marine environment.

In general, projects that rely on aircraft operations in MBNMS are very limited in scope and time frame (up to 40 flight hours per year). In the unlikely event an unmanned aerial system requires an unintentional or emergency landing, care would be taken to ensure minimal impact to habitat and living marine resources. Impacts on water quality would be minimal because the systems are sealed and very unlikely to leak fluid or break apart in the case of an emergency landing on water. Similarly, impacts to air quality would be **negligible** because most unmanned aerial systems are battery operated and do not emit air pollutants.

To avoid the risk of emergency landings, all remote aerial system operators are highly trained and licensed to operate systems prior to use within MBNMS in compliance with FAA regulations and NOAA standing orders. Aircraft operations do not generally occur below 200 feet in elevation and generally operate at elevations of 500 feet or more, thereby minimizing potential interaction with birds and other biological resources. Additionally, there are regulatory overflight zones in MBNMS where flights below 1,000 feet are prohibited. To avoid adverse impacts to the acoustic environment and sensitive habitats and species, NOAA would:

- conduct aircraft operations outside of MBNMS-regulated overflight zones¹⁴;
- avoid bird and mammal rookeries; and
- maintain a safe distance between the aircraft and any marine mammals or other protected species present.

In sum, aircraft operations would have **less than significant adverse** impacts to biological resources in MBNMS due to their small size, the infrequency of these operations, the scale of the impacts in relation to existing acoustic disturbances in MBNMS, and compliance with training requirements, overflight zones, and standing orders by aircraft systems operators. Impacts on protected species and habitats are described in detail in **Section 5.5**.

Regulations

Under Alternative A, NOAA would forgo the opportunity to update the sanctuary regulations to address coastal erosion issues and reduce negative impacts of deep-water buoy deployments on seafloor benthic habitat. **Adverse** impacts of this would include: continued erosion of shoreline habitat and beaches resulting from shoreline construction activities, coastal armoring, sea level rise, and storm activity; and mooring failures of NOAA buoys that create marine debris and drag

¹⁴ If the use of a low overflight zone for remote sensing surveying were required, this activity would be individually permitted by MBNMS after individual environmental review and consultation, as necessary, as described in Sections 1.5.3 and 1.5.4.

along the seafloor causing disturbance of substrates and habitat. These forgone benefits would be **less than significant** in the context of the entire sanctuary because of the relatively small scale of adverse impacts currently occurring in these areas due to coastal erosion and mooring failures.

5.2.3 Impacts on the Human and Socioeconomic Setting (No Action Alternative)

This section describes the impacts on the socioeconomic setting and human uses of MBNMS from implementing routine field activities, the 2008 sanctuary management plan, and existing sanctuary regulations. The components of the no action alternative are described in detail in **Sections 3.2.1, 3.3.1, and 3.4**. An overview of the sanctuary's human and socioeconomic setting is provided in **Section 4.4**.

5.2.3.1 Beneficial Impacts on the Human and Socioeconomic Setting (No Action Alternative)

Existing sanctuary regulations limit discharges into the sanctuary that could compromise water quality and restrict prohibited activities that might adversely affect resources in MBNMS. Implementing these regulations would further the protection of important habitat and living marine resources in MBNMS. These resources provide important benefits to recreational, tourism, and commercial users of the sanctuary and the local region. For example, recreational and commercial fishing rely on healthy marine ecosystems for their success. Additionally, existing sanctuary regulations provide for use of motorized personal watercraft by recreational users in five zones. These zones allow motorized personal watercraft to access surf zones and provide safety support to surfers in the sanctuary.

Further, as part of implementing the current sanctuary management plan through routine field activities, conducting resource protection and emergency response activities would remove hazards from the waters and coastlines of MBNMS. This would remove debris and minimize risk of hazardous spills occurring on coastal beaches, which could limit public access and recreational use of the sanctuary.

Education programs delivered through sanctuary visitor centers are designed to enhance public awareness and understanding of the sanctuary and its resources, and build stewards to help take on the responsibility of protecting these special underwater treasures. MBNMS education strategies aim to raise the public's awareness and understanding of the local and regional marine environment, while creating engagement opportunities for protecting sanctuary resources. NOAA utilizes education as a resource management tool to address specific priority ecosystem protection issues, and both complements and promotes other sanctuary programs such as research, maritime heritage, and enforcement through multiple outreach and communication strategies.

These continued **beneficial** impacts to the socioeconomic setting and human uses in MBNMS from the no action alternative would be **less than significant** because the scope and intensity of current sanctuary management activities are not large enough to result in significant, permanent changes to these resources.

5.2.3.2 Adverse Impacts on the Human and Socioeconomic Setting (No Action Alternative)

Under the no action alternative, some minor adverse impacts to the socioeconomic setting and human uses of the sanctuary would result from conducting routine field activities and other management activities. Adverse impacts from these activities are described below.

Routine Resource Protection and Stewardship Activities

Occasionally the removal of a sunken or grounded vessel from a beach requires a section of the beach to be closed for a short period of time, while salvage activities take place. Temporary beach closures could mean that the public loses access to recreation areas in the sanctuary temporarily. The closures are usually not more than a few hours and occur close to the site of the salvage operation. Generally, salvage and emergency response activities are episodic and only require short-term activity along beaches. These activities aim to remove potentially dangerous or hazardous materials to ensure public safety and access to beaches. Due to the low frequency of emergency response and salvage activities, the **adverse** impacts to public access to beaches and recreation from these activities would be temporary and **less than significant**.

Field Operations

Conducting routine field activities can have minor adverse effects on human uses of the sanctuary through temporary operational interference with commercial, research, or recreational activities in the sanctuary. Generally, any interference between NOAA and other users of the sanctuary would be temporary and would not result in any significant effect on the operations of recreational, research, or commercial users. The current use of the sanctuary waters by MBNMS staff and other recreational, research, and commercial users has not resulted in any conflict. MBNMS staff routinely collaborate with these other users on research and outreach activities. Therefore, any **adverse** impact from field operations on human uses in the sanctuary would be **negligible**.

Regulations

Under Alternative A, NOAA would forgo the opportunity to update the sanctuary regulations to address coastal erosion issues and reduce negative impacts of deep-water buoy deployments. **Adverse** impacts of this to other users of the sanctuary would include: continued erosion of shoreline beaches that would reduce opportunities for public access to the coastline and recreation; and mooring failures of MBNMS buoys that create navigational and public safety hazards, and adverse aesthetic impacts. These forgone benefits would be **less than significant** in the context of the entire sanctuary because of the relatively small scale of adverse impacts currently occurring in these areas due to coastal erosion and mooring failures.

5.2.4 Impacts on the Historical and Cultural Setting (No Action Alternative)

This section describes the impacts on the historical and cultural setting within MBNMS from implementing routine field activities, the 2008 sanctuary management plan, and existing sanctuary regulations. The components of the no action alternative are described in detail in

Sections 3.2.1, 3.3.1, and 3.4. An overview of the sanctuary's historical and cultural setting is provided in **Section 4.5.**

5.2.4.1 Beneficial Impacts on the Historical and Cultural Setting (No Action Alternative)

Existing sanctuary regulations limit discharges into the sanctuary that could compromise water quality and restrict prohibited activities. Continuing to implement these regulations would further protect the important historical and cultural resources present in MBNMS.

As part of implementing the current sanctuary management plan through routine field activities, research and monitoring programs provide sanctuary managers with information to inform decisions related to resource protection. Continued research and monitoring of historical and cultural resources in MBNMS provide opportunities for improved management of these resources and increased stewardship among users of sanctuary waters. In addition, resource protection activities mitigate potential direct adverse impacts to cultural and historical resources by avoiding damage from hazardous waste leaks, groundings or strandings, and other accidental disturbance of cultural or historical resources. Education and outreach activities focused on these cultural and historical resources further the public's understanding of the importance of stewardship and protection of the region's history and culture. This could result in changes in behavior and decision-making of individuals, communities, organizations, and agencies in ways that could indirectly benefit historical and cultural resources within the sanctuary.

These **beneficial** impacts to the historical and cultural setting from the no action alternative would be **less than significant** because the scope and intensity of current sanctuary management activities are not large enough to result in significant, permanent changes to the protection of historical and cultural resources in MBNMS.

5.2.4.2 Adverse Impacts on the Historical and Cultural Setting (No Action Alternative)

Under the no action alternative, some minor adverse impacts to the historical and cultural resources within the sanctuary would result from conducting routine field activities and other management activities. Adverse impacts from these activities are described below.

Operating MBNMS Vessels Within the Sanctuary

Routine vessel operations can have less than significant adverse effects on the seafloor and water quality in MBNMS through anchoring, unintentional sinkings or groundings, or accidental leaks of hazardous substances. These potential adverse impacts are described in more detail in **Section 5.2.1.2.** If such disturbance of the seafloor were to occur, any historical shipwrecks or cultural sites present in the impacted area could be damaged by collision with a sunken or grounded vessel. Similarly, accidental leaks of hazardous substances could compromise the integrity of cultural sites or shipwrecks.

MBNMS-led vessel operations would occur infrequently (up to 90 days at sea on three ONMS vessels up to 65 feet in length), therefore making the risk of accidental leaks or groundings very low. In addition, all ONMS vessels must comply with the operational protocols and procedures in the NOAA Small Boats Policy (NAO 209-125) and ONMS best management practices as

detailed in **Appendix C** to avoid harm or disturbance to cultural and historical resources. Existing state, federal, and sanctuary regulations prohibit most intentional discharges, therefore direct impacts to water quality from vessel operations are expected to be highly unlikely because they would only occur from accidental discharge.

If NOAA were to conduct or authorize activities involving systematic, planned physical disturbance to the terrestrial or marine substrate, these activities would require a sanctuary permit and would be evaluated in advance for proximity to locations of properties listed on the National Register of Historic Places, and would not be conducted in the immediate vicinity of documented historical or cultural resources. If an undocumented resource is identified or suspected, sanctuary staff would cease operations and consult with the ONMS West Coast Regional Maritime Heritage Coordinator, State Historic Preservation Officer, and Tribal Historic Preservation Officer before additional disturbance would be allowed.

Operating vessels requires routine vessel maintenance. Maintenance could result in decreased water quality if contaminants used to maintain boats (e.g., oil and cleaning chemicals) inadvertently enter sanctuary waters. For ONMS vessels used by MBNMS staff, this routine maintenance is generally conducted by trained NOAA personnel or contractors in Monterey Harbor. Heavy maintenance is typically accomplished on land in self-contained contractor facilities which are highly regulated for industrial safety and environmental compliance by local, state, and federal entities. Where possible, bio-based lubricants and fluids (and in some cases bio-based fuels) are used further reducing the threat to water quality resources in the unlikely event of a spill. Because most vessel maintenance activities are conducted outside MBNMS and by highly-trained staff, the risk of contaminants entering sanctuary waters is extremely low. Therefore, it is highly unlikely that routine vessel maintenance would have any detectable effect on historical and cultural resources present in MBNMS.

Overall, the **adverse** impacts of vessel operations and maintenance on cultural and historical resources within MBNMS would be **less than significant** because of the low intensity and frequency of vessel operations and maintenance within MBNMS, and adherence to regulations and best management practices that would minimize seafloor disturbance and leaks from vessels that might pose a risk to historical and cultural resources.

Scuba and Snorkel Operations

Normal scuba and snorkel operations can cause minor **adverse** effects on historical and cultural resources during dives due to disturbance of seafloor sediments at sites where these resources might be located. Scuba and snorkel operations do not involve discharge, therefore there is no further risk to water quality beyond temporary increases in turbidity. Overuse of specific locations may result in larger or longer-term disturbance of sediments at these sites.

NOAA may conduct up to 250 dives per year to support habitat, species, and oceanographic studies, natural resource damage assessments, and locating and characterizing cultural and maritime heritage resources. During these activities, dive site location often varies by project, and therefore prevents overuse of any specific location. Generally, cultural and historical resources are very rarely encountered at typical diving depths. Compared to the effects of natural water motion and seafloor disturbances at these sites from currents, waves, and storms, the infrequent scuba and snorkel activities are minor.

If NOAA were to conduct or authorize activities involving systematic, planned physical disturbance to the terrestrial or marine substrate, these activities would require a sanctuary permit and would be evaluated in advance for proximity to locations of properties listed on the National Register of Historic Places, and would not be conducted in the immediate vicinity of documented historical or cultural resources. If an undocumented resource is identified or suspected, sanctuary staff would cease operations and consult with the ONMS West Coast Regional Maritime Heritage Coordinator, State Historic Preservation Officer, and Tribal Historic Preservation Officer before additional disturbance would be allowed. Furthermore, MBNMS divers and snorkelers are highly trained, and would employ ONMS best management practices to avoid harm or disturbance to cultural and historical resources.

The impacts of scuba and snorkel operations on cultural and historical resources within MBNMS would be **less than significant** due to the low intensity and frequency of scuba and snorkel operations, and adherence to regulations and best management practices that would minimize seafloor disturbance that might pose a risk to historical and cultural resources.

Deployment of Equipment on the Seafloor

Deployment of equipment on the seafloor can have minor adverse impacts on cultural and historical resources in MBNMS through temporary or long-term disturbance of sediments. NOAA deploys buoy-based scientific equipment for research and monitoring, mooring buoys for marking zone boundaries for motorized personal watercraft use, hydrophones, and oil spill response booms. All of these require deployment of mooring hardware on the seafloor, which can range from weighted moorings systems to screw anchors that go below the marine substrate. Deployment of any equipment on the seafloor below the substrate can impact and damage historical and cultural resources that are fragile and non-renewable resources. Compared to the entire seafloor area of the sanctuary, the areas impacted by research equipment and MBNMS buoys on the seafloor is miniscule. Moreover, the equipment is retrieved when possible to download data and because these instruments are often expensive. When conducting such deployments, staff implement the following ONMS best management practices to mitigate damage to the seafloor and any cultural or historical resources present:

1. First, determine if there are known or recorded archaeological sites at the site, and
2. Second, conduct a visual survey of the seafloor prior to deployment of equipment onto the seafloor.

If NOAA were to conduct or authorize activities involving systematic, planned physical disturbance to the terrestrial or marine substrate, these activities would require a sanctuary permit and would be evaluated in advance for proximity to locations of properties listed on the National Register of Historic Places, and would not be conducted in the immediate vicinity of documented historical or cultural resources. If an undocumented resource is identified or suspected, sanctuary staff would cease operations and consult with the ONMS West Coast Regional Maritime Heritage Coordinator, State Historic Preservation Officer, and Tribal Historic Preservation Officer before additional disturbance would be allowed. In general, adverse impacts to cultural and historical resources from these deployments would be less than significant because the activities are periodic, spread out in space and time, and care is taken

when placing equipment to avoid sensitive areas of the seafloor or any disturbance of important sites.

Deployment of Autonomous Underwater Vehicles, Remotely Operated Vehicles, Gliders, and Drifters

Deployment of autonomous underwater vehicles, remotely operated vehicles, gliders, or drifters can cause adverse impacts to cultural and historical resources through unintentional collision with the seafloor or accidental groundings where these resources are located. The operations of such equipment within MBNMS would be periodic and low intensity (i.e., up to 40 ROV deployments per year), and would support response to vessel casualties and associated assessments of resource damage, characterizing seafloor habitats and ecologically significant areas, and visual reconnaissance surveys associated with historic documentation on last reported positions of ship and aircraft wreck sites. Shipwreck reconnaissance surveys focus on individual sites that are considered “potentially eligible” to determine if they are in fact “eligible” for inclusion for the National Register of Historic Places. Surveys frequently employed at this level of investigation include visual surveys with no excavation or physical contact with historical artifacts. If a vehicle were to accidentally or intentionally collide with the seafloor, the impacts would be the same as those described above for vessel anchoring or deployment of equipment on the seafloor. Additionally, there is a slight risk that studying and identifying historic and culturally-significant sites may lead to looters removing important historical or cultural resources from these sites. As such, NOAA takes precautions to keep location information confidential, as appropriate.

If NOAA were to conduct or authorize activities involving systematic, planned physical disturbance to the terrestrial or marine substrate, these activities would require a sanctuary permit and would be evaluated in advance for proximity to locations of properties listed on the National Register of Historic Places, and would not be conducted in the immediate vicinity of documented historical or cultural resources. If an undocumented resource is identified or suspected, sanctuary staff would cease operations and consult with the ONMS West Coast Regional Maritime Heritage Coordinator, State Historic Preservation Officer, and Tribal Historic Preservation Officer before additional disturbance would be allowed.

Overall, the **adverse** impacts of these vehicles on cultural and historical resources within MBNMS would be **less than significant** because of the low intensity and frequency of operations, and adherence to regulations and best management practices that would minimize seafloor disturbance that might pose a risk to historical and cultural resources.

Operations of Non-Motorized Craft

Routine operations of non-motorized craft would have **no adverse effect** on the cultural and historical resources in MBNMS. Sanctuary staff and volunteers use kayaks to conduct on the water outreach to recreational and commercial operators in the sanctuary. Kayaks are small, lightweight, slow, and maneuverable, and therefore are generally not capable of inflicting consequential damage on geological features or sediment. In addition, non-motorized craft do not discharge any substance in the water, and therefore are expected to have **no adverse effect** on the historical and cultural resources present in MBNMS.

Onshore Fieldwork

Onshore fieldwork can have adverse effects on cultural and historical resources through disturbance of sediments in the intertidal zone, and changes in water quality from accidental leaks or marine debris. NOAA staff and volunteers conduct onshore field work to support educational and citizen science efforts. These activities encourage visitation to intertidal zones and can cause transient disturbance of resources by increasing human presence in these areas. In addition, MBNMS-led research or response teams operate in the intertidal zone when conducting emergency removal or salvage of sunken or grounded vessels, aircraft, vehicles, and other discharged matter. Salvage or recovery activities can cause disturbance when debris is introduced onshore or if it is dragged along the shore or if heavy equipment is required to remove debris. If grounded vessels contain hazardous materials (e.g., fuel), salvage and recovery can rarely result in spills that compromise water quality and cause damage to historical and cultural sites.

All research activities and incident responses onshore are designed and conducted in order to not interfere with historical artifacts that may be found in the area. NOAA-contracted salvors must follow best practices, which includes removal of all fuel and removal of large vessel parts such as engine, tanks, and hull. These best practices reduce the risk of accidental spills or dispersal of debris into the intertidal zone or waters of the sanctuary during emergency response activities. Moreover, NOAA staff and participants in MBNMS-led stewardship, emergency response, education, and research programs are highly trained and instructed on ways to minimize their impacts on sensitive areas when conducting onshore activities. Adherence to regulations and best management practices further minimize seafloor disturbance or hazardous leaks that might pose a risk to historical and cultural resources.

If NOAA were to conduct or authorize activities involving systematic, planned physical disturbance to the terrestrial or marine substrate, these activities would require a sanctuary permit and would be evaluated in advance for proximity to locations of properties listed on the National Register of Historic Places, and would not be conducted in the immediate vicinity of documented historical or cultural resources. If an undocumented resource is identified or suspected, sanctuary staff would cease operations and consult with the ONMS West Coast Regional Maritime Heritage Coordinator, State Historic Preservation Officer, and Tribal Historic Preservation Officer before additional disturbance would be allowed.

Overall, the **adverse** impacts of onshore fieldwork on cultural and historical resources within MBNMS would be **less than significant** because any disturbance of sediments and changes in water quality would be temporary, and activities would be conducted by small groups of well-trained people and would occur widely distributed in space and time. Additionally, there is a low likelihood of onshore fieldwork occurring at sites where historical and cultural resources are present because of the widely scattered nature of these resources.

Regulations

Under Alternative A, NOAA would forgo the opportunity to update the sanctuary regulations to address coastal erosion issues and reduce negative impacts of deep-water buoy deployments on the seafloor. **Adverse** impacts of this would include: continued erosion of shoreline habitat and beaches resulting from shoreline construction activities, coastal armoring, sea level rise, and

storm activity; and mooring failures of MBNMS buoys that create marine debris and drag along the seafloor causing potential disturbance of cultural sites and historical shipwrecks on the seafloor. These forgone benefits would be **less than significant** in the context of the entire sanctuary because of the relatively small scale of adverse impacts currently occurring in these areas due to coastal erosion and mooring failures and the widely scattered nature of cultural and historical sites in MBNMS.

5.3 Impacts of Alternative B

This section describes the impacts on the resource areas and human uses in and around the sanctuary that would occur under Alternative B. Under Alternative B, NOAA would continue to conduct field activities and implement existing sanctuary regulations to protect and manage sanctuary resources, and revise the sanctuary management plan to respond to current threats to sanctuary resources and increase public involvement and outreach.

Generally, the impacts of Alternative B are of the same type and intensity of the impacts described under the no action alternative in **Section 5.2**. However, there are some additional impacts from revisions to the sanctuary management plan. These additional impacts are described in **Sections 5.3.1 to 5.3.4** below.

5.3.1 Impacts on the Physical Setting (Alternative B)

This section describes the impacts on the physical setting from implementing routine field activities, existing sanctuary regulations, and a revised sanctuary management plan. The components of Alternative B are described in detail in **Sections 3.2.2, 3.3.2, and 3.4**. An overview of the sanctuary's physical setting is provided in **Section 4.1**.

5.3.1.1 Beneficial Impacts on the Physical Setting (Alternative B)

Implementing the revised sanctuary management plan proposed would focus on addressing emergent environmental concerns in the sanctuary (e.g., climate change, coastal erosion, and marine debris) as well as expanding work in ongoing priority areas (e.g., ocean noise, outreach and education programs, and management of invasive species).

The activities proposed in the revised sanctuary management plan would provide NOAA with increased information to inform resource protection decisions and promote ocean literacy and stewardship. These activities would improve the understanding, management, and protection of sanctuary resources and therefore provide direct beneficial impacts to water quality, the acoustic environment, and geology, oceanography, and soils in MBNMS. These impacts would go beyond the scope of the impacts described under the no action alternative because the new sanctuary management plan addresses new environmental concerns and priorities related to resource protection and public involvement.

By expanding research, outreach, and education activities, NOAA has the potential to expand the knowledge base and promote ocean stewardship principles with partners, local communities, and the general public. This creates an opportunity to influence the behavior and decision-making of individuals, communities, organizations, and agencies in ways that could indirectly benefit physical resources within the sanctuary.

For example, as part of implementing the Water Quality and Marine Debris action plans, NOAA would lead and support citizen science projects. These projects can involve collecting marine debris from beaches and other coastal areas, and monitoring water quality and microplastic presence in streams or coastal areas. Microplastic monitoring within the Salinas Valley would quantify the types, amounts, and sources of plastic being transferred from agriculture fields that may ultimately end up in MBNMS. Implementing these actions would help to ameliorate the adverse impacts of marine debris and water contamination by removing debris from these zones and improving understanding of the persistence of debris and plastics in the marine environment. This knowledge would lead to outreach to growers and other users of the coastal region to encourage better decision-making related to plastic product purchasing, use, disposal, and recyclability. This can help to inform behavior and policy change that would reduce the introduction of contaminants into the physical environment in the future. These actions would also educate people on becoming better stewards of ocean and coastal ecosystems which beneficially influences long-term efforts to protect physical resources. Removing marine debris and monitoring water quality encourages removal of contamination, has a beneficial effect on water quality, and reduces risks of habitat damage from marine debris in the physical environment.

In sum, implementing new and revised action plans as part of a revised sanctuary management plan would have direct and indirect benefits to the physical resources within MBNMS. While the impacts of these management plan activities would be **beneficial**, their effects would be **less than significant** because the scope and intensity of current sanctuary management activities would be small relative to the size of the sanctuary. Therefore, the proposed action would not result in significant, permanent changes to the physical setting of MBNMS over the five to 10-year implementation period for the revised sanctuary management plan.

5.3.1.2 Adverse Impacts on the Physical Setting (Alternative B)

The implementation of the revised sanctuary management plan is not expected to result in any additional interaction between sanctuary management activities and the physical setting of the sanctuary beyond those described under Alternative A (no action alternative). Therefore, the **adverse** impacts of Alternative B on the physical setting in MBNMS would be the same as Alternative A, as described in **Section 5.2.1.2**, which were all **less than significant**.

5.3.2 Impacts on the Biological Setting (Alternative B)

This section describes the impacts on the biological setting from implementing routine field activities, existing sanctuary regulations and a revised sanctuary management plan. The components of Alternative B are described in detail in Sections **3.2.2**, **3.3.2**, and **3.4**. An overview of the sanctuary's biological setting is provided in **Section 4.2**.

5.3.2.1 Beneficial Impacts on the Biological Setting (Alternative B)

Implementing the revised sanctuary management plan proposed would focus on addressing emergent environmental concerns in the sanctuary (e.g., marine debris, impacts to and management of Sanctuary Ecologically Significant Areas, and use of motorized personal watercraft) as well as expanding work in ongoing priority areas (e.g., wildlife entanglement and

ocean noise, outreach and education programs, management of invasive species, and expanding research and monitoring at Davidson Seamount and Sur Ridge).

The activities proposed in the revised sanctuary management plan would provide NOAA with increased information to inform resource protection decisions, as well as promote ocean literacy and stewardship. These activities would improve the understanding, management, and protection of sanctuary resources and therefore provide direct beneficial impacts to the living marine resources and habitats in MBNMS. These impacts would go beyond the scope of the impacts described under the no action alternative because the new sanctuary management plan addresses new environmental concerns and priorities related to resource protection and public involvement.

Research and monitoring projects supported or conducted by sanctuary staff are designed to increase understanding of the structure, function, resilience, and status of the resources MBNMS manages. An increased knowledge of the processes, dynamics, and responses of these systems to both human-induced and natural changes improve management of these resources. In addition, detection, rapid response, monitoring, eradication, and restoration programs related to introduced species are designed to increase our understanding of the nature and the impact of introduced species on native biodiversity. An increased knowledge of ecological interactions between introduced and native species can improve our management of these resources and restore impacted habitats and communities. These research and monitoring projects would have an indirect, beneficial impact on habitats and biota within MBNMS through improved knowledge and subsequent management of these biological resources.

By expanding research, outreach, and education activities, NOAA has the potential to expand the knowledge base and promote ocean stewardship principles with partners, local communities, and the general public. This creates an opportunity to influence the behavior and decision-making of individuals, communities, organizations, and agencies in ways that could indirectly benefit species that reside in or transit through the sanctuary. For example, as part of the Water Quality and Marine Debris action plans, MBNMS would lead and support citizen science projects that collect marine debris from intertidal areas or conduct phytoplankton, water quality, or microplastic monitoring. These projects would have direct beneficial effects on biological resources in coastal areas of the sanctuary by removing potential contaminants that may harm living marine species or make habitat inhabitable. Additionally, expanding outreach programs to produce more informative presentations, signage, media, and print materials would indirectly further decrease human disturbance of living marine resources by increasing the public knowledge of sensitive habitats and species in MBNMS.

In sum, implementing new and revised action plans as part of a revised sanctuary management plan would have direct and indirect benefits to the biological resources within MBNMS. While the impacts of these management plan activities would be **beneficial**, their effects would be **less than significant** because the scope and intensity of current sanctuary management activities would be small relative to the size of the sanctuary. Therefore, the proposed action would not result in significant, permanent changes to the biological setting of MBNMS over the five to 10-year implementation period for the draft revised sanctuary management plan.

5.3.2.2 Adverse Impacts on the Biological Setting (Alternative B)

The implementation of the revised sanctuary management plan is not expected to result in any additional interaction between sanctuary management activities and the biological setting of the sanctuary beyond those described under Alternative A (no action alternative). Therefore, the **adverse** impacts of Alternative B on the biological setting in MBNMS would be the same as Alternative A, as described in **Section 5.2.2.2**, which were all **less than significant**.

5.3.3 Impacts on the Human and Socioeconomic Setting (Alternative B)

This section describes the impacts on the socioeconomic setting and human uses of MBNMS from implementing routine field activities, existing sanctuary regulations, and a revised sanctuary management plan. The components of Alternative B are described in detail in **Sections 3.2.2, 3.3.2, and 3.4**. An overview of the sanctuary's human and socioeconomic setting is provided in **Section 4.4**.

5.3.3.1 Beneficial Impacts on the Human and Socioeconomic Setting (Alternative B)

Implementing the revised sanctuary management plan proposed would focus on addressing emergent environmental concerns in the sanctuary (e.g., coastal erosion, evaluating offshore wind energy and artificial reefs, and use of motorized personal watercraft) as well as expanding work in ongoing priority areas (e.g., implementing new programs at visitor centers, wildlife entanglement and ocean noise, expanding outreach and education programs, and management of invasive species).

The activities proposed in the revised sanctuary management plan would provide NOAA with increased information to inform resource protection decisions, as well as promote ocean literacy and stewardship. These activities would improve the understanding, management, and protection of sanctuary resources and therefore provide direct beneficial impacts to the living marine resources and habitats in MBNMS. These resources provide important benefits to recreational, tourism, and commercial users of the sanctuary and the local region. For example, recreational and commercial fishing rely on healthy marine ecosystems for their success. These impacts would go beyond the scope of the impacts described under the no action alternative because the new sanctuary management plan addresses new environmental concerns and priorities related to resource protection, recreation, human uses, and public involvement.

Implementing a revised sanctuary management plan would advance regional ocean governance through improved coordination and collaboration, support long-term research and monitoring efforts, improve opportunities for recreation and public use of the sanctuary, and increase the value of the sanctuary for educational and research activities. These activities would result in indirect, beneficial impacts to the human and socioeconomic setting within or adjacent to MBNMS. For example, improving interpretive signage in the field at strategic shoreline locations would help to increase awareness and build knowledge of MBNMS to thousands of shoreline visitors each year. This increases the exposure of sanctuary messages to wide-ranging public audiences on resource protection issues (e.g., reducing wildlife disturbance) and research

and monitoring activities, as well as maritime heritage in MBNMS. Expanding outreach to kayak and whale watch businesses and collaboration on the development of best practices related to marine mammal and seabird viewing under a revised sanctuary management plan would also lead to better protection and interaction for the wildlife these businesses depend upon.

In addition, several proposed strategies and actions described in the revised sanctuary management plan coordinate fishery education, management, research, or resource protection programs that may directly or indirectly affect commercial fisheries. These proposed strategies and actions are not mandatory for the fishing community, instead the activities focus on coordinating and collaborating with fishery managers and fishermen on issues of concern or to characterize and monitor benthic habitats. Enhanced coordination and collaborations among fishery managers, fishermen, and MBNMS staff are expected to increase efficiencies in data collection, analysis, and communication, which are indirectly beneficial for the sanctuary ecosystem and habitats that healthy commercial fisheries depend on. Similarly, the proposed strategies and actions in the Water Quality Protection Program Action Plan describe activities that coordinate and collaborate with state and local programs and stakeholders to improve water quality in the watersheds of the sanctuary through research and monitoring, data sharing, and training. Enhanced water quality of the sanctuary is beneficial for onshore and Monterey Harbor abalone aquaculture operations to grow healthy abalone for market and for all marine fisheries.¹⁵

In sum, implementing new and revised action plans as part of a revised sanctuary management plan would have direct and indirect benefits to the socioeconomic setting and human uses within MBNMS. While the impacts of these management plan activities would be **beneficial**, their effects would be **less than significant** because the scope and intensity of current sanctuary management activities would be small relative to the size of the sanctuary. Therefore, the proposed action would not result in significant, permanent changes to the socioeconomic setting and human uses of MBNMS over the five- to 10-year implementation period for the draft revised sanctuary management plan.

5.3.3.2 Adverse Impacts on the Human and Socioeconomic Setting (Alternative B)

The implementation of the revised sanctuary management plan is not expected to result in any additional interaction between sanctuary management activities and other human uses of the sanctuary beyond those described under Alternative A (no action alternative). Therefore, the **adverse** impacts of Alternative B on the human and socioeconomic setting in MBNMS would be the same as Alternative A, as described in **Section 5.2.3.2**, which were all **less than significant**.

¹⁵ The criteria used to determine the significance of impacts on commercial fisheries are based on social and economic factors and fisheries population dynamics. Impacts are considered to be significant if proposed actions would result in the following: reduced the number of fishing vessels allowed to fish in the area; reduced the size of the allowable catch of a fishery; resulted in a substantial positive or negative population trend in one or more of the harvested species; resulted in significant economic gain or loss to commercial fisheries; or conflicted with the policies and regulations established by the Magnuson-Stevens Act. ONMS concluded that the potential impacts on commercial fishing activity in MBNMS from the proposed action do not meet these criteria for significance.

5.3.4 Impacts on the Historical and Cultural Setting (Alternative B)

This section describes the impacts on the historical and cultural setting within MBNMS from implementing routine field activities, existing sanctuary regulations, and a revised sanctuary management plan. The components of Alternative B are described in detail in **Sections 3.2.2, 3.3.2, and 3.4**. An overview of the sanctuary's historical and cultural setting is provided in **Section 4.5**.

5.3.4.1 Beneficial Impacts on the Historical and Cultural Setting (Alternative B)

Implementing the revised sanctuary management plan would focus on addressing emergent environmental concerns in the sanctuary (e.g., coastal erosion, marine debris, and use of motorized personal watercraft) as well as expanding work in ongoing priority areas (e.g., ocean noise, outreach and education programs, and management of invasive species).

The activities proposed in the revised sanctuary management plan would promote ocean and cultural resource literacy, improve understanding and protection of heritage resources, and improved ocean stewardship. These activities would increase opportunities for research and monitoring to better understand, manage, and protect historical and cultural resources in MBNMS. In addition, expanding research, education and outreach activities as part of the revised Maritime Heritage action plan would further the public's understanding of the importance of stewardship and protection of the region's history and culture.

In sum, implementing new and revised action plans as part of a revised sanctuary management plan would have direct and indirect benefits to the historical and cultural resources within MBNMS. While the impacts of these management plan activities would be **beneficial**, their effects would be **less than significant** because the scope and intensity of current sanctuary management activities would be small relative to the size of the sanctuary. Therefore, the proposed action would not result in significant, permanent changes to the historical and cultural setting of MBNMS over the five- to 10-year implementation period for the revised sanctuary management plan.

5.3.4.2 Adverse Impacts on the Historical and Cultural Setting (Alternative B)

The implementation of the revised sanctuary management plan is not expected to create any additional risk of impact to historical and cultural resources beyond those anticipated impacts described under Alternative A (no action alternative). Therefore, the **adverse** impacts from Alternative B on the historical and cultural setting in MBNMS would be the same as Alternative A, as described in **Section 5.2.4.2**, which were all **less than significant**.

5.4 Impacts of Alternative C

This section describes the impacts on the resource areas and human uses in and around the sanctuary that would occur under Alternative C. Under Alternative C, NOAA would continue to conduct field activities to protect and manage sanctuary resources; revise the sanctuary management plan to respond to current threats to sanctuary resources and increase public

involvement and outreach; and revise sanctuary regulations to further protect sanctuary resources.

Generally, the impacts of Alternative C would be of the same type and intensity of the impacts described under the no action alternative in **Section 5.2**, plus those additional impacts from Alternative B, described in **Section 5.3**. However, there are some additional impacts from revisions to sanctuary regulations. These impacts are described below in **Sections 5.4.1 to 5.4.4**.

5.4.1 Impacts on the Physical Setting (Alternative C)

This section describes the impacts on the physical setting from implementing routine field activities, a revised sanctuary management plan, and revised sanctuary regulations. The components of the regulatory changes proposed in Alternative C are described in detail in **Sections 3.2.3, 3.3.3, and 3.4**. An overview of the physical setting is provided in **Section 4.1**.

5.4.1.1 Beneficial Impacts on the Physical Setting (Alternative C)

Under Alternative C, some additional beneficial impacts on the physical setting would result from proposed revisions to sanctuary regulations. Beneficial impacts from these regulatory changes are described below.

“Beneficial Use of Dredged Material” Definition (New)

Under Alternative C, NOAA would add a definition for the phrase “beneficial use of dredged material” to the MBNMS regulations. This regulatory action would allow the permitted placement of suitable dredged material within the sanctuary for habitat protection or restoration purposes. This proposed action serves to clarify the regulations but does not authorize any individual projects, which would undergo future individual project-level environmental reviews.

Portions of the coastline adjacent to MBNMS have been permanently altered over time, resulting in the disruption of natural sediment transport patterns (California Resources Agency, 2001). A typical example of this is a harbor with a dual jetty system extending into the ocean to protect its entrance from direct wave action. Normally, sediment entering the ocean from rivers and upland erosion is transported by longshore currents down the coast through nearshore waters, where it feeds a series of beach areas. When such sediment reaches a jetty or fixed structure perpendicular to the shoreline, it often becomes trapped on the upcoast side of the structure or gets washed into the harbor entrance channel where it settles out. If not for the artificial jetty structure, that sediment would continue downcoast, feeding beaches with regular fresh sediment supplies. The result is that the entrance channel begins to fill in, becoming shallower and threatening safe navigation. Meanwhile, the beaches immediately down coast of the harbor jetties can slowly erode due to interrupted resupply of the sediment now washing into the harbor. If the sediment artificially trapped in the harbor channel is removed and placed on an eroded beach immediately adjacent to the harbor, subsequent wave and tidal action will sort and redistribute the sediment to rebuild the beach as if the sediment had been placed there by natural ocean processes. In essence, this engineering solution attempts to compensate for the impact of the jetties to natural sediment transport processes. As long as the sediment dredged from the harbor is suitable, beach nourishment programs can be effective in restoring natural equilibrium of adjacent beaches impacted by the harbor’s presence. These extracted sediments

would not constitute dredge waste material, but instead would be employed to restore lost ecological services. In essence, the sediments would be transferred from the harbor to the beach to continue the destined ecological function that was interrupted by artificial shoreline structures.

The proposed regulatory action would clarify NOAA's authority to permit beneficial use projects within the sanctuary (i.e., below the mean high water line) to meet the purposes of habitat protection or restoration. NOAA considers "habitat restoration" to mean the placement of sediment for the purpose of re-establishing natural habitats that have been negatively impacted by erosion processes (natural or human-caused), including but not limited to wetlands, sandy beaches, and coastal dune habitats. NOAA considers "habitat protection" to mean the placement of sediment at sites in the sanctuary to protect against habitat degradation and reduce the need for future habitat restoration. This would allow for using suitable dredged sediments for beach nourishment within MBNMS on a case-by-case basis, with strict government oversight in compliance with all federal, state, and local laws.

MBNMS has accommodated requests for beneficial use of sediment for beach nourishment in locations where the bathymetry and topography allow space for beach nourishment above the mean high water line. Beach replenishment projects are currently conducted by the city of Monterey at Del Monte Beach, Moss Landing Harbor District at Salinas River and Moss Landing State beaches, and the city of Santa Cruz at Twin Lakes State Beach, as described in **Section 4.1.2.3**. Any new approved beach nourishment programs would most likely occur near urban areas where the greatest volume of engineered shoreline alterations is found. The four major urban coastal communities adjacent to MBNMS are Half Moon Bay, the Santa Cruz area, Moss Landing, and the Monterey peninsula. These areas have already been significantly altered from their original natural conditions.

Beach nourishment activities are generally expected to have long-term beneficial impacts on physical habitats by restoring beach habitat, as well as preserving public access and use of coastal beaches. Restabilizing beach sediment budgets in areas that were disrupted by engineered coastal infrastructure would help restore impaired ecological services, as well as coastal access for use and enjoyment by the public. NOAA expects this proposed regulatory change action would have beneficial effects on the physical setting by restoring natural sediment to habitats impaired by engineered coastal infrastructure and by protecting against habitat degradation to mitigate the need for future restoration. For any given project, NOAA would measure the short-term and long-term effectiveness of beneficial use habitat protection and restoration projects. NOAA expects that these **beneficial** impacts would be **negligible or less than significant**. However, NOAA would complete a detailed analysis of the potential environmental impacts of any future projects requiring a sanctuary permit or authorization. At that time the scope of the action would be better defined for any given beach nourishment project. NOAA would follow the steps outlined in **Section 1.5.4** to determine what level of environmental review and consultation would be required at that time.

Before issuance of any sanctuary permit or authorization for use of dredged material for a beneficial use habitat protection or restoration project, completion of a project-specific environmental review under NEPA would be required, as well as permitting and review by other

federal, state, and local agencies, as appropriate. Any proposals for beneficial use would be closely evaluated to ensure suitability of the sediment. Impacts of any proposed project on physical resources—particularly water quality, intertidal habitat, the soundscape, geology, and soils—would be evaluated in detail when specific projects are proposed.

Motorized Personal Watercraft Zone Boundary Changes

Under Alternative C, NOAA would modify the boundaries of four year-round motorized personal watercraft zones. The proposed modifications would reduce the total number of deployed boundary buoys from 15 to nine and reduce the risk of associated mooring failures that create marine debris, seafloor impacts, and excessive maintenance effort. The four zones are located at Monterey, Santa Cruz, Half Moon Bay, and Moss Landing. See **Section 3.4.3.3** for maps depicting the boundaries of each current zone and the proposed new boundaries.

Current zone boundary buoys stationed off rocky points have experienced repeated mooring failures due to heavy wave diffraction/reflection, abrasive and mobile rocky substrate impacts on mooring tackle, and lack of soft sediments for secure anchor set. Deeper moorings have repeatedly failed due to suspected interactions with vessels and commercial fishing gear. Failed moorings cause deposition and dragging of chain and anchors on the seafloor. Reconfiguration of zones would achieve a 40% reduction in the overall number of deployed zone boundary buoys from a total of 15 to nine. It would eliminate six previous buoy mooring stations entirely; replace four previous mooring stations with four new shallower mooring stations; and leave five previous mooring stations unchanged. This would result in the permanent removal of anchors and chain from the seafloor at 10 sites and installation of anchors and chain at four new sites – a 40% net reduction of ongoing seafloor impacts from zone boundary buoy moorings.

The four new mooring stations would be in much shallower water than their predecessors and would be deliberately sited in mud or sand substrate to avoid rocky reef habitat and other sensitive areas of the seafloor – a measurable reduction of negative environmental impacts associated with seafloor disturbance. This would reduce the scale of potential impacts to the seafloor substrate from mooring buoy maintenance associated with implementing the motorized personal watercraft zones. It would also reduce the spatial area for potential negative impacts to habitat resulting from motorized personal watercraft casualties, such as sinking or groundings. NOAA does not expect zone reconfiguration to affect use levels in any of the zones.

Buoys and moorings would be removed and installed using a small vessel and would involve deployment of recoverable equipment on the seafloor. The general impacts to the physical environment from the routine field activities that would be necessary to implement this proposed regulatory change are evaluated in **Section 5.2.1.2**.

In sum, this proposed regulatory change would result in beneficial impacts to the physical setting by reducing the impacts to the seafloor from mooring buoy deployment and mooring station failures. Acoustic impacts would be minimal because the size and location of the modified zones are similar to the current zones and motorized personal watercraft use levels in these zones are not expected to change. These **beneficial** impacts would be **less than significant** because of the small footprint of mooring buoys, and the small total number of buoys deployed.

5.4.1.2 Adverse Impacts on the Physical Setting (Alternative C)

Under Alternative C, some additional adverse impacts on the physical setting would result from proposed revisions to sanctuary regulations. Adverse impacts from these regulatory changes are described below.

“Beneficial Use of Dredged Material” Definition (New)

Temporary disturbance of the physical setting could occur during the implementation of any specific beneficial use habitat protection or restoration project. Specific adverse effects on the physical setting associated with beneficial use habitat protection or restoration activities would likely include short-term impacts to water quality (e.g., increased turbidity during and immediately after placement of material in the intertidal zone); alteration of the seafloor; and increased physical activity and noise during the placement operation. NOAA expects that these **adverse** impacts would be **negligible** or **less than significant**, even with the removal of the word ‘clean’ from the definition, as the review to ensure suitability of sediment would assess the sediment quality and water quality as well as compatibility of physical properties of the sediment. This review would further the same purposes and objectives as the originally proposed “clean” standard without resulting in a prohibitively strict threshold for consideration of beneficial use habitat or restoration projects. Moreover, any future habitat protection or restoration project proposal would be subject to sanctuary permit and/or authorization requirements, including consideration of whether the activity would be conducted in a manner compatible with the primary objective of protection of sanctuary resources and qualities and a detailed analysis of the potential environmental impacts and the scope of those impacts.

NOAA would follow the steps outlined in **Section 1.5.4** to determine the level of environmental review and consultation required. Before issuing a sanctuary permit or authorization for the beneficial use of dredged material for habitat protection or restoration purposes, completion of a project-specific environmental review under NEPA would be required, as well as permitting and review by other federal, state, and local agencies, as appropriate. Any proposals for beneficial use of dredged materials would be carefully evaluated to ensure suitability of the sediment. Impacts of the proposed project on physical resources—particularly water quality, intertidal habitat, the acoustic environment, geology and soils—would be evaluated in detail at that time.

A proposed project involving the use of dredged material would only be eligible for approval by NOAA if the project demonstrates a sanctuary habitat protection or restoration purpose under the new proposed definition of “beneficial use of dredged material” at 15 CFR 922.131. The director would assess the suitability of the sediment using water quality and sediment quality criteria that are established and updated by the sanctuary to ensure that it matches the physical properties of native sediments at any planned receiving site (e.g., grain size, sediment type) and meets sanctuary water quality objectives.

The ONMS director has broad authority in applying permit review criteria to ensure any proposed project would be conducted in a manner that is compatible with the primary objective of protecting sanctuary resources and qualities, to consider other permit review factors deemed appropriate, and to include any permit terms or conditions deemed appropriate (15 C.F.R. 922.133). The ONMS director also has broad authority in applying authorization reviews to

include any terms or conditions deemed reasonably necessary to protect sanctuary resources and qualities (15 C.F.R. 922.49(a)(4), 922.132(e)).

5.4.2 Impacts on the Biological Setting (Alternative C)

This section describes the impacts on the biological setting from implementing routine field activities, a revised sanctuary management plan, and revised sanctuary regulations. The components of the regulatory changes proposed in Alternative C are described in detail in **Sections 3.2.3, 3.3.3, and 3.4**. An overview of the sanctuary's biological setting is provided in **Section 4.2**. Impacts on protected species and habitats are described in detail in **Section 5.5**.

5.4.2.1 Beneficial Impacts on the Biological Setting (Alternative C)

Under Alternative C, some additional beneficial impacts on the biological setting would result from proposed revisions to sanctuary regulations. Beneficial impacts from these regulatory changes are described below.

Motorized Personal Watercraft Zone Boundary Changes

Under Alternative C, NOAA would modify the boundaries of four year-round motorized personal watercraft zones. The proposed modifications would reduce the total number of deployed boundary buoys to from 15 to nine and reduce the risk of associated mooring failures that create marine debris and seafloor impacts that could affect living organisms. The four zones are located at Monterey, Santa Cruz, Half Moon Bay, and Moss Landing. See **Section 3.4.3.3** for maps depicting the boundaries of each current zone and the proposed new boundaries. In addition, **Section 5.4.1.1** describes the beneficial impacts of reducing the number of buoys deployed on seafloor substrate and benthic habitat (the physical setting).

Reconfiguration of the four year-round zones would achieve a 40% reduction in the overall number of deployed special mark buoys from a total of 15 to nine. Reducing the number of buoys deployed would have a beneficial impact on benthic and intertidal organisms by shrinking the footprint of impacted areas of the seafloor and reducing potential injuries from mooring failures that may result in the dragging of steel chain across the seafloor by drifting buoys. In addition, an approximately 60% reduction in total aerial coverage of generally smaller reconfigured zones would equally reduce the area subject to potential interactions between motorized personal watercraft and marine wildlife, such as whales, dolphins, sea lions, and sea otters. NOAA does not expect zone reconfiguration to affect use levels in any of the zones.

All four zones are adjacent to urbanized shorelines with historically elevated levels of human activity. Nevertheless, distribution, abundance, and sensitivity of local biological resources were expressly considered in reconfiguring each zone in order to minimize wildlife disturbance and human/wildlife interactions as much as practicable. New zone boundaries were selected that omit and avoid close proximity to kelp forest habitat, as well as state and local marine protected areas. Zone corner points were carefully sited at mud/sand locations to provide an effective, resilient anchor set for zone demarcation buoys and to specifically avoid negative impacts to rocky reef habitat, flora, and fauna.

For example, a portion of the reconfigured Santa Cruz zone would extend closer to shore between Seabright State Beach and Soquel Point, but the proposed boundaries were carefully

selected to remain a considerable distance from kelp forest habitat to avoid disturbance of marine wildlife that concentrate within the kelp canopy and below. The reconfigured Half Moon Bay zone would extend due south from the Pillar Point Harbor entrance. The southern edge of the zone would encompass an isolated kelp bed overlying Southeast Reef, centered approximately 1.65 miles southeast of the harbor entrance and extending between U.S. Coast Guard red bell buoy “2” and U.S. Coast Guard green gong buoy “1S.” This kelp bed would lie at the far end of the zone, is not regularly frequented by marine species, and is not part of a large contiguous kelp tract. Its position at the most distant edge of the zone would likely result in infrequent approach by motorized personal watercraft, which rarely explore the zone. Additionally, since kelp can jam water jet impellers, causing mechanical damage/failure, motorized personal watercraft operators generally avoid maneuvering within kelp canopies.

Buoys and moorings would be removed and installed using a small vessel and would involve deployment of recoverable equipment on the seafloor. The general impacts to the biological environment from the routine field activities that would be necessary to implement this proposed regulatory change are evaluated in **Section 5.2.2.2**. Because the revised zones would generally be smaller and mostly within the bounds of their original footprints, and because NOAA does not expect zone modifications to change the use levels in any zone, the impacts on biological communities in these areas are expected to be similar to the status quo.

In sum, this proposed regulatory change would result in beneficial impacts to the biological setting by reducing the extent of seafloor habitat and biota potentially impacted by mooring buoy deployment and chain drag incidental to drifting buoys. These **beneficial** impacts would be **less than significant** because the number of zones and general zone locations would remain unchanged; the scope of impact of each individual mooring would remain unchanged; the use levels of motorized personal watercraft in these zones is expected to remain unchanged; and the total number of buoys deployed remains small.

5.4.2.2 Adverse Impacts on the Biological Setting (Alternative C)

Under Alternative C, some additional adverse impacts on the biological setting would result from proposed revisions to sanctuary regulations. Adverse impacts from these regulatory changes are described below.

“Beneficial Use of Dredged Material” Definition (New)

Temporary disturbance of the biological setting could potentially occur during the implementation of any specific beach nourishment project. Specific adverse effects on the biological setting associated with beneficial use habitat protection or restoration activities would likely include: short-term impacts to water quality (e.g., increased turbidity during and immediately after placement of sediment in the intertidal zone); alteration of the seafloor causing disturbance of seafloor habitat and biota; and increased physical and acoustic disturbance of coastal and marine species during the placement operation. Habitat and associated living organisms on the seafloor and in the intertidal zone would likely be temporarily disturbed and potentially injured by human activity supporting beneficial use habitat protection or restoration projects. NOAA expects that these **adverse** impacts would be **negligible** or **less than significant**. However, any future beneficial use habitat protection or restoration project proposal would be subject to sanctuary permit and/or authorization

requirements, including a detailed analysis of potential environmental impacts and the scope of those impacts. NOAA would follow the steps outlined in **Section 1.5.4** to determine the level of environmental review and consultation required. Before issuing a sanctuary permit and/or authorization for the beneficial use of dredged material for habitat protection or restoration projects, completion of a project-specific environmental review under NEPA would be required, as well as permitting and review by other federal, state, and local agencies, as appropriate.

Any proposals for beneficial use of dredged materials would be carefully evaluated to ensure suitability of the sediment. NOAA would conduct a detailed evaluation of impacts of any proposed project on biological resources – particularly water quality and intertidal habitat critical to living marine resources and any protected species and habitats. The review to ensure suitability of sediment would assess the sediment quality and water quality as well as compatibility of physical properties of the sediment. This review would further the same purposes and objectives as the originally proposed “clean” standard without resulting in a prohibitively strict threshold for consideration of beneficial use projects. Moreover, any future beneficial use habitat protection or restoration proposal would be subject to sanctuary permit requirements, including consideration of whether the activity would be conducted in a manner compatible with the primary objective of protection of sanctuary resources and qualities and a detailed analysis of the potential environmental impacts and the scope of those impacts.

A proposed project involving the use of dredged material would only be eligible for approval by NOAA if the project demonstrates a sanctuary habitat protection or restoration purpose under the new proposed definition of “beneficial use of dredged material” at 15 CFR 922.131. The director would assess the suitability of the sediment using water quality and sediment quality criteria that are established and updated by the sanctuary to ensure that it matches the physical properties of native sediments at any planned receiving site (e.g., grain size, sediment type) and meets sanctuary water quality objectives.

The ONMS director has broad authority in applying permit review criteria to ensure any proposed project would be conducted in a manner that is compatible with the primary objective of protecting sanctuary resources and qualities, to consider other permit review factors deemed appropriate, and to include any permit terms or conditions deemed appropriate (15 C.F.R. 922.133). The ONMS director also has broad authority in applying authorization reviews to include any terms or conditions deemed reasonably necessary to protect sanctuary resources and qualities (15 C.F.R. 922.49(a)(4)).

Access to Motorized Personal Watercraft Zone at Mavericks Surf Break (Proposed Update)

Under Alternative C, NOAA would amend sanctuary regulations to change the current High Surf Warning requirement for motorized personal watercraft access to Mavericks (Zone 5) to a less stringent High Surf Advisory requirement. High Surf Advisory conditions are predicted breaking waves at the shoreline of 15 feet or greater. Allowing motorized personal watercraft access to Mavericks during High Surf Advisory conditions would allow their presence at the surf break three to five more days a year to provide safety assistance to surfers operating in a highly energized surf zone.

Since 2008, the Greater Farallones National Marine Sanctuary Beach Watch program has conducted visual marine wildlife surveys along the San Mateo County coastline. Zone 5 is directly adjacent to a Beach Watch survey site at Pillar Point/Mavericks Beach. Several important marine species have been observed in the area. Because of this, access to Mavericks by motorized personal watercraft is only permitted during the winter months (December to February) when marine mammal presence in the area is low. Beach Watch observation data collected from 2008 to present reveal that harbor seals were three times more likely to be observed in the area during non-winter months than during winter months. As shown in **Figure 11(a)**, in the winter months, harbor seals were observed in the area at an average monthly rate of five per kilometer, compared to 16 per kilometer in the non-winter months. Similarly, observation data for pinnipeds (California and Steller sea lions and unidentifiable species of otariid, phocid, and pinniped) demonstrate that these species are also infrequently observed in the area during winter months. As shown in **Figure 11(b)**, in the winter months, pinnipeds were observed in the area at an average monthly rate of seven per kilometer, compared to 23 per kilometer in the non-winter months.

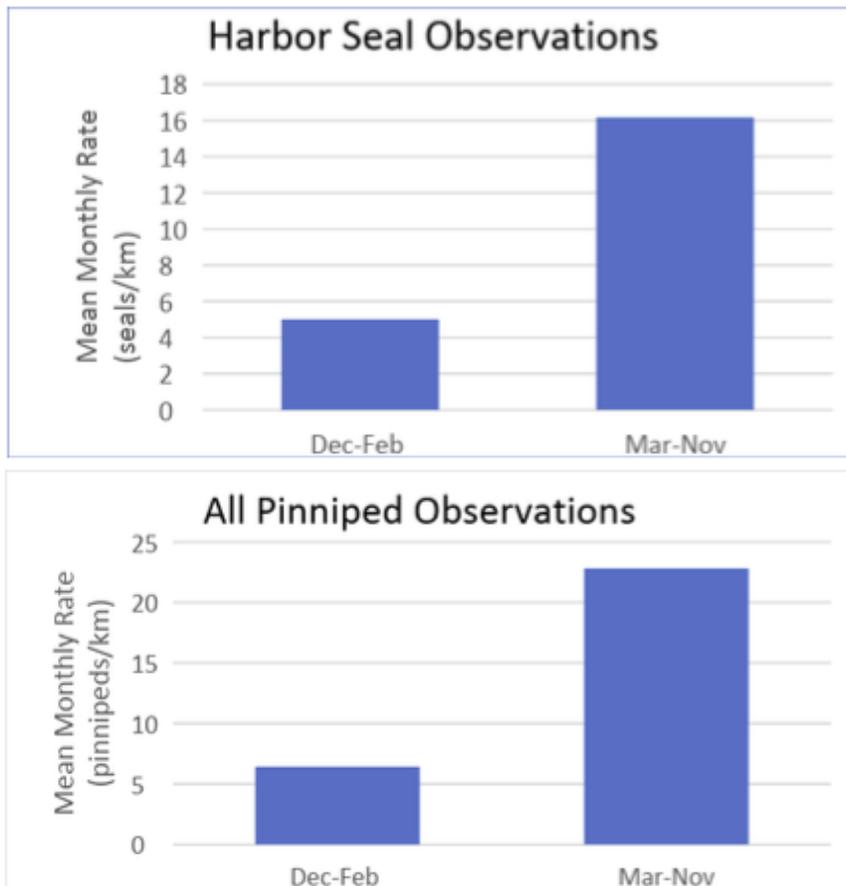


Figure 11. (a) Harbor seal mean monthly rates (harbor seals per kilometer observed in the vicinity of Zone 5 during the open months of Dec-Feb and closed months of Mar-Nov); (b) Pinniped mean monthly rates (all pinnipeds per kilometer observed in the vicinity of Zone 5 during the open months of Dec-Feb and closed months of Mar-Nov).

Southern sea otters have also been observed in this area. Over the past four years, the U.S. Geological Survey recorded four reports of stranded sea otters between Point San Pedro and Martin's Beach during summer months (three strandings from shark bites and one from domoic acid poisoning). Beach Watch data includes one observation of a sea otter in the vicinity of Zone 5. U.S. Geological Survey and Beach Watch data do not have any documented disturbances or injuries to sea otters in this area from motorized personal watercraft. While seabirds are observed in this area year-round, they are not likely to be present in the vicinity of Zone 5 when surf conditions are large and when motorized personal watercraft would be present (e.g., during a High Surf Advisory or High Surf Warning). Because of the low expected abundance of marine species in Zone 5 during winter months and when motorized personal watercraft might be present (high surf conditions), impacts to these species from the proposed regulatory change are expected to be similar to the status quo or **negligible**.

Since motorized personal watercraft are already authorized to access Mavericks under High Surf Warning conditions, allowing access to the break under less stringent High Surf Advisory conditions would not increase the inherent risk of sinking/grounding and subsequent impacts to biological resources. These craft have operating characteristics unlike any traditional vessel. They are specifically designed to survive capsizing and even immersion, while maintaining full operational capability, and their speed and high maneuverability enable an experienced rider to effectively operate in ocean conditions that would immediately imperil a traditional vessel. The regulatory change would allow a modest increase of motorized personal watercraft presence at Mavericks. However, the potential for a motorized personal watercraft casualty and resulting environmental harm in lesser sea conditions than a High Surf Warning for no more than three to five additional days per winter presents a **negligible** additional risk of impacts to biological resources.

Given the lower presence of wildlife observed in the Pillar Point area during winter months and the lack of reported wildlife disturbances in the vicinity of Zone 5, reducing the restriction for motorized personal watercraft access to Mavericks (from High Surf Warning to High Surf Advisory) would not likely result in an increased risk of wildlife disturbance. Beach Watch observational data showing increased presence of marine wildlife in the area during non-winter months supports keeping the "seasonal" restriction in place for Zone 5 to avoid disturbing seal, sea lion, and sea otter populations during these times. Therefore, NOAA determined that allowing motorized personal watercraft access to Mavericks during a High Surf Advisory (predicted breaking waves at the shoreline of 15 feet or greater) would benefit surfer safety, while posing a **negligible** additional risk of disturbance to wildlife and habitat in the area due to the low likelihood of marine wildlife (particularly seals, sea lions, and sea otters) presence in Zone 5 during winter extreme high-surf events.

5.4.3 Impacts on the Human and Socioeconomic Setting (Alternative C)

This section describes the impacts on the socioeconomic setting and human uses of MBNMS from implementing routine field activities, a revised sanctuary management plan, and revised sanctuary regulations. The components of the regulatory changes proposed in Alternative C are

described in detail in **Sections 3.2.3, 3.3.3, and 3.4**. An overview of the sanctuary’s human and socioeconomic setting is provided in **Section 4.4**.

5.4.3.1 Beneficial Impacts on the Human and Socioeconomic Setting (Alternative C)

Under Alternative C, some additional beneficial impacts on the socioeconomic resources and human uses of MBNMS would result from proposed revisions to sanctuary regulations. Beneficial impacts from these regulatory changes are described below.

“Beneficial Use of Dredged Material” Definition (New)

Under Alternative C, NOAA would add a definition for the phrase “beneficial use of dredged material” to the MBNMS regulations. Generally, beach nourishment can benefit recreation, public access to beaches, and coastal areas by widening beaches for the purposes of recreation, reducing threats to onshore infrastructure, and mitigating against future coastal erosion and sea level rise that could harm local communities, residents, and businesses. Overall, this regulatory change would not pose additional burdens to the public, but rather, would increase the availability of projects that may be permitted to help address coastal erosion and beach nourishment in the sanctuary. NOAA expects that these **beneficial** impacts would be **negligible** or **less than significant**. However, any future proposal for beneficial use of dredged material for habitat protection or restoration purposes would be subject to sanctuary permit or authorization requirements, including a detailed analysis of potential environmental impacts and the scope of those impacts.

NOAA would follow the steps outlined in **Section 1.5.4** to determine the level of environmental review and consultation required. Before issuing a sanctuary permit or authorization for the beneficial use of dredged material for habitat protection or restoration purposes, completion of a project-specific environmental review under NEPA would be required, as well as permitting and review by other federal, state, and local agencies, as appropriate. Impacts of the proposed project on human uses and the socioeconomic setting—particularly recreation, residential and business uses, and public shoreline access—would be evaluated in detail at that time.

Access to Motorized Personal Watercraft Zone at Mavericks Surf Break (Proposed Update)

Under Alternative C, NOAA would amend the sanctuary regulations to change the current High Surf Warning requirement for motorized personal watercraft access to Mavericks (Zone 5) to a less stringent High Surf Advisory requirement. High Surf Advisory conditions are predicted breaking waves at the shoreline of 15 feet or greater. Allowing motorized personal watercraft access to Mavericks during High Surf Advisory conditions would allow their presence at the surf break three to five more days per year to provide safety assistance to surfers operating in a highly energized surf zone.

From 1993 to 2009, MBNMS regulations prohibited motorized personal watercraft from operating at the Mavericks surf break and elsewhere to protect marine wildlife from high-speed vessel operations. During this time, the MBNMS definition for motorized personal watercraft pertained only to small, 1-2 person capacity motorized personal watercraft. During this same period, surfers began using 3-4 person motorized personal watercraft to tow into waves at

Mavericks without restriction, since these larger craft did not, by definition, qualify as motorized personal watercraft. In 2006, NOAA formally proposed a regulatory change to the MBNMS motorized personal watercraft definition that would include 3-4 person motorized personal watercraft. NOAA determined that, since marine wildlife activity in the area decreases to minimal annual levels during winter months, and especially during winter high surf events, allowing motorized personal watercraft access to Mavericks under such conditions would likely pose no additional threat to sanctuary resources. Based on input from a NOAA-hosted working group representing many interested parties (including paddle and tow surfers), NOAA incorporated a High Surf Warning (20 feet or higher) requirement into its regulation for access to Zone 5. These regulations for the revised motorized personal watercraft definition and establishment of a seasonal-conditional zone for Mavericks (Zone 5) took effect in March 2009.

As tow surfers accessed waves previously considered out of reach, paddle surfers developed techniques for paddling into such waves, and some tow surfers began to join them. Consequently, paddle surfers began routinely surfing 20+ foot waves at Mavericks. Unique bathymetric features at Mavericks can amplify waves to 20 feet well before a High Surf Warning is for San Mateo County shorelines – a regulatory prerequisite for motorized personal watercraft operation at the break. Since Mavericks wave heights can easily reach 20 feet, while waves elsewhere in the county are breaking at only 15 feet, some big-wave surfers requested that NOAA allow motorized personal watercraft at Mavericks during winter High Surf Advisory conditions to provide a measure of safety for paddle surfers now operating in more extreme surf conditions. In February 2017, an MBNMS Advisory Council subcommittee recommended lowering the current conditional threshold for motorized personal watercraft access to Mavericks from a High Surf Warning to a High Surf Advisory during winter months. The MBNMS Advisory Council voted unanimously to support the subcommittee recommendation on February 17, 2017. NOAA subsequently determined that allowing motorized personal watercraft access to Mavericks during a High Surf Advisory would benefit surfer safety, while posing no added threat to protected wildlife due to minimal wildlife activity in the area during extreme winter high-surf events.

Allowing motorized personal watercraft access to Mavericks during a High Surf Advisory (predicted breaking waves at the shoreline of 15 feet or greater) would allow motorized personal watercraft presence at the surf break approximately three to five more days per year to provide additional safety assistance to surfers operating in a highly energized surf zone. Implementing the proposed regulatory change would provide a modest expansion of recreational activity at Mavericks without negatively impacting other recreational pursuits in the area. It would improve public safety by allowing private motorized personal watercraft to be immediately present during high surf conditions to render aid to surfers as needed. During extreme wave conditions associated with a High Surf Advisory, small craft are advised not to go to sea, therefore no negative interactions between motorized personal watercraft and marine traffic are likely. By the same token, any visual or audible esthetic concerns would be negated by harsh weather and/or sea conditions that would likely limit public access to the shoreline and mask any sound emissions from motorized personal watercraft. Therefore, the proposed regulatory change would allow a modest increase of motorized personal watercraft presence at Mavericks, resulting in **less than significant, beneficial** effects on the socioeconomic setting and human uses in MBNMS.

Motorized Personal Watercraft Zone Boundary Changes

Under Alternative C, NOAA would modify the boundaries of four year-round motorized personal watercraft zones. The modification would reduce the total number of deployed boundary buoys from 15 to nine and reduce associated navigational hazards, aesthetic impacts, and mooring failures that create public safety hazards, marine debris, seafloor impacts, and excessive maintenance effort. The four zones are located at Monterey, Santa Cruz, Half Moon Bay, and Moss Landing. See **Section 3.4.3.3** for maps depicting the boundaries of each current zone and the proposed new boundaries. In addition, **Sections 5.4.1.1** and **5.4.2.1** describe the beneficial impacts to habitat and biota of reducing the number of deployed buoys.

Current zone boundary buoys stationed off rocky points have experienced repeated mooring failures due to heavy wave diffraction/reflection, abrasive and mobile rocky substrate impacts on mooring tackle, and lack of soft sediments for secure anchor set. Deeper moorings have repeatedly failed due to suspected interactions with vessels and commercial fishing gear. Failed moorings cause deposition of chain and anchors on the seafloor and pose a hazard to mariners and the public from drifting buoys. Even when buoys hold station, they can present navigation obstacles and affect visual aesthetics. Therefore, reducing the number of boundary buoys from 15 to nine by reconfiguring zones to use less regulatory buoys and more existing marks and features (e.g., U.S. Coast Guard navigational buoys and points of land) would reduce mooring failures, navigational and public hazards, marine debris, and esthetic impacts. In addition, reconfiguring zones to be smaller and closer to shore (within shallower mooring depths) would improve resilience, inspection and maintenance of remaining regulatory buoys and would aid zone enforcement and zone use surveys. This, in turn, would reduce navigational hazards to boaters, as well as obstructions to the natural seascape viewed by the general public.

The proposed modification would reduce the overall area available for motorized personal watercraft recreation within MBNMS. However, current information indicates that current use of these zones is infrequent and of very low volume (on average, less than 10 trips per-year, per-zone). Therefore, the number of individuals affected by the change would be low, while the number of individuals benefiting (boaters and the general public) from the removal of navigational hazards (zone marker buoys) and the resulting esthetic improvements to the natural seascape would be high. Also, the removal of zone marker buoys at deeper stations would reduce the potential for negative interactions between the moored buoys and commercial fishery operations and other marine traffic.

Specifically, the proposed zone reconfigurations would shorten the length of the motorized personal watercraft access corridors to the Santa Cruz and Monterey zones by 66% and 23% respectively, allowing operators easier and quicker access to both riding areas. In addition, the reconfigured zone boundaries at Santa Cruz would shift the zone closer to shore, improving safety for operators should they need emergency assistance. These specific zone modifications at Santa Cruz have been requested by users in the past. Since the prescribed 100-yard wide transit corridor for accessing the Santa Cruz zone from the small craft harbor would be two-thirds shorter, users would be in the transit corridor for less time, resulting in a shorter period of restricted maneuverability and lower potential for negative interaction with marine traffic approaching or departing the harbor entrance. These same benefits would apply to the shortened transit corridor at Monterey.

Optimizing the use of U.S. Coast Guard navigational aids as zone markers can substantially improve on-water visual (and even audible) identification of zone boundaries. Standard U.S. Coast Guard navigational buoys extend 12 feet above the waterline compared to the 4-foot high standard zone marker buoys deployed by MBNMS. Therefore, the U.S. Coast Guard buoys are much easier to see from the vantage point of a motorized personal watercraft operator, providing greater situational awareness. In addition, U.S. Coast Guard buoys are equipped with lights and/or bells/gongs for enhanced detection during low-visibility conditions. Buoys and moorings would be removed and installed using a small vessel and would involve deployment of recoverable equipment on the seafloor. The general impacts to the socioeconomic setting from the routine field activities that would be necessary to implement this proposed regulatory change are evaluated in **Section 5.2.3.2**.

In sum, this proposed regulatory change would result in beneficial impacts to the human and socioeconomic setting by reducing the number of buoys deployed and the associated risk of navigational hazards and interactions with ongoing human uses in or adjacent to the zones. These **beneficial** impacts would be **less than significant** because of the small footprint of mooring buoys used in MBNMS and the small total number of buoys deployed.

5.4.3.2 Adverse Impacts on the Human and Socioeconomic Setting (Alternative C)

The regulatory changes proposed under Alternative C would not result in adverse impacts to the socioeconomic setting or human uses of MBNMS. These proposed regulatory changes are designed to improve opportunities for safe use of motorized personal watercraft in the sanctuary and allow for restoration of beaches and other coastal areas to provide benefits to coastal residents and businesses.

5.4.4 Impacts on the Historical and Cultural Setting (Alternative C)

This section describes the impacts on the historical and cultural setting within MBNMS from implementing routine field activities, a revised sanctuary management plan, and revised sanctuary regulations. The components of the regulatory changes proposed in Alternative C are described in detail in **Sections 3.2.3, 3.3.3, and 3.4**. An overview of the sanctuary's historical and cultural setting is provided in **Section 4.5**.

5.4.4.1 Beneficial Impacts on the Historical and Cultural Setting (Alternative C)

Under Alternative C, some additional beneficial impacts on the historical and cultural setting would result from proposed revisions to sanctuary regulations. Beneficial impacts from these regulatory changes are described below.

Motorized Personal Watercraft Zone Boundary Changes

Under Alternative C, NOAA proposes to modify the boundaries of four year-round motorized personal watercraft zones. The proposed modifications would reduce the total number of deployed boundary buoys to from 15 to nine and reduce the risk of associated mooring failures that create marine debris, and seafloor impacts that could cause damage to cultural sites and historical shipwrecks on the seafloor. The four zones are located at Monterey, Santa Cruz, Half

Moon Bay, and Moss Landing. See **Section 3.4.3.3** for maps depicting the boundaries of each current zone and the proposed new boundaries.

Current zone boundary buoys stationed off rocky points have experienced repeated mooring failures due to heavy wave diffraction/reflection, abrasive and mobile rocky substrate impacts on mooring tackle, and lack of soft sediments for secure anchor set. Deeper moorings have repeatedly failed due to suspected interactions with vessels and commercial fishing gear. Failed moorings cause deposition and dragging of chain and anchors on the seafloor. Reconfiguration of zones would achieve a 40% reduction in the overall number of deployed zone boundary buoys from a total of 15 to nine. It would eliminate six previous buoy mooring stations entirely; replace four previous mooring stations with four new shallower mooring stations; and leave five previous mooring stations unchanged. This would result in the permanent removal of anchors and chain from the seafloor at 10 sites and installation of anchors and chain at four new sites - a 40% net reduction of ongoing seafloor impacts from zone boundary buoy moorings, thereby reducing potential harm to cultural sites and historical shipwrecks. The four new mooring stations would be in much shallower water than their predecessors and would be deliberately sited in mud or sand substrate, away from known cultural sites and historical shipwrecks.

Buoys and moorings would be removed and installed using a small vessel and would involve deployment of recoverable equipment on the seafloor. The general impacts to the historical and cultural environment from the routine field activities that would be necessary to implement this proposed regulatory change are evaluated in **Section 5.2.4.2**.

In sum, this proposed regulatory change would result in beneficial impacts to the historical and cultural setting by reducing the volume and severity of impacts to the seafloor from mooring buoy deployment and incidental damage from mooring station failures. These **beneficial** impacts would be **less than significant** because of the small footprint of mooring buoys used in MBNMS and the small total number of buoys deployed.

5.4.4.2 Adverse Impacts on the Historical and Cultural Setting (Alternative C)

Under Alternative C, some additional adverse impacts on the historical and cultural setting would result from proposed revisions to sanctuary regulations. Adverse impacts from these regulatory changes are described below.

“Beneficial Use of Dredged Material” Definition (New)

Temporary disturbance of the seafloor could potentially occur during the implementation of any specific beneficial use habitat protection or restoration project. This seafloor disturbance could create the potential for damage to important cultural and historic sites in those areas during the sediment placement operation. NOAA expects that these **adverse** impacts would be **negligible** or **less than significant**. However, any future beneficial use habitat protection or restoration proposal would be subject to sanctuary permit and/or authorization requirements, including a detailed analysis of potential environmental impacts and the scope of those impacts. NOAA would follow the steps outlined in **Section 1.5.4** to determine the level of environmental review and consultation required.

Before issuing a sanctuary permit for beneficial use of dredged material for habitat protection or restoration purposes, completion of a project-specific environmental review under NEPA would be required, as well as permitting and review by other federal and state agencies, as appropriate.

NOAA would evaluate the impacts of any proposed project on historical and cultural resources in detail upon submission of specific project proposals and would conduct a Section 106 consultation under the National Historic Preservation Act, as needed. Specifically, if NOAA were to conduct or authorize activities involving systematic, planned physical disturbance of the seafloor, these activities would require a sanctuary permit or authorization and would be evaluated in advance for proximity to locations of properties listed on the National Register of Historic Places. MBNMS would not authorize the conduct of activities within the immediate vicinity of documented historical or cultural resources. If an undocumented historical or cultural resource were discovered during authorized activities, sanctuary staff would instruct the project leader to cease operations. MBNMS staff would consult with the ONMS West Coast Regional Maritime Heritage Coordinator, State Historic Preservation Officer, and Tribal Historic Preservation Officer to determine whether project operations could resume and whether additional terms and conditions would be required.

5.5 Impacts on Protected Species and Habitats (Common to All Alternatives)

Managing and operating the sanctuary could impact species and habitats protected under the Endangered Species Act (ESA) and Essential Fish Habitat (EFH) protected under the Magnuson–Stevens Fishery Conservation and Management Act (MSA). NOAA analyzed the potential environmental consequences to protected species and habitats within the regulatory framework of the relevant statute. See **Section 4.3.1** for a description of protected species and habitats most commonly occurring in the action area and designated critical habitat that overlaps with the action area. A complete species list is included in **Appendix D**.

For ESA-listed species, effect determinations include the following:

- **No effect:** When the proposed action will not affect a listed species or designated critical habitat.
- **May affect, but not likely to adversely affect:** When effects on listed species are expected to be discountable, insignificant, or completely beneficial.
 - Beneficial effects: Contemporaneous positive effects without any adverse effects on the species.
 - Insignificant effects: Relate to the size of the impact and should never reach the scale where take occurs.
 - Discountable effects: Those extremely unlikely to occur.
- **May affect, and is likely to adversely affect:** If any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial.

For designated critical habitat, the effect determination must discuss whether the proposed action may result in a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of an ESA-listed species.

5.5.1 Impacts on species Under USFWS Jurisdiction

As described in **Section 4.3.1** and **Appendix D**, NOAA ONMS determined that five ESA-listed species under USFWS jurisdiction may occur within the action area and could be affected by the proposed action: southern sea otter, tidewater goby, California red-legged frog, marbled murrelet, and western snowy plover. ONMS analyzed the potential beneficial and adverse impacts to these species due to human disturbance and habitat loss or degradation as a result of the proposed action.

5.5.1.1 Impacts on Birds

ONMS determined that two species of listed bird may occur within the action area and may be affected by the proposed action: marbled murrelet and western snowy plover. Potential impacts to the listed birds include human disturbances and potential adverse impacts to water quality resulting from sanctuary management activities, including routine field activities. Beneficial impacts would be due to sanctuary management activities, including resource protection and stewardship activities aimed at protecting foraging habitats, and making improvements to water quality in MBNMS.

The action area provides potential foraging and nesting habitat for western snowy plover which forage in the receding surf on sand-dwelling crustaceans. The marbled murrelet occasionally feeds along coastal bluffs and in the surf zone at MBNMS and are most likely to be present during summer months. The California clapper rail is not expected to occur in the action area. Until the 1980s they were observed in Elkhorn Slough, but are now only known to occur in the salt marshes of San Francisco Bay, outside of the MBNMS action area.

Human Disturbances

Intense human disturbance may disrupt nesting or foraging activities of birds and reduce their ability to maintain adequate weights or provide sufficient care to eggs or chicks. Within MBNMS, human disturbance likely to affect listed birds is limited to vessel traffic and noise from recreational activities, removal of marine debris, or vessel and aircraft traffic to support operations of the sanctuary, such as research, monitoring, resource protection, or educational activities. Noise from these activities could disturb or displace listed birds, or cause minor trampling of habitat or invertebrate and fish species that provide food for bird species. However, this noise would be of short duration and limited to small portions of the shoreline adjacent to MBNMS. ONMS does not expect that implementing the proposed action would result in an increase in vessel operations conducted by NOAA in the sanctuary.

As part of the proposed action, MBNMS would operate aerial drones to map habitats and monitor species distribution and abundance. These activities are generally permitted individually by the MBNMS superintendent, and would be conducted to avoid interactions with listed bird species and to avoid known bird rookeries. The western snowy plover may be subject to slightly more disturbance from normal sanctuary management activities such as debris removal from beaches and other onshore fieldwork, as this shorebird species may be more likely

found on coastal beaches and intertidal areas of MBNMS. Noise and other human activity levels during the next five to 10 years are expected to remain similar to current levels. Human activities, including deployment of aerial drones, vessel transit, and onshore fieldwork, that take place in areas where birds are feeding could cause these species to leave or avoid the area causing minor behavioral disturbance. However, this disturbance is not expected to harm or harass listed bird species in the action area. Therefore, because these activities are infrequent and low intensity, ONMS expects the impacts of human disturbance on listed bird species present in MBNMS to be **insignificant**.

Water Quality

As discussed above in **Sections 5.2.1, 5.3.1, and 5.4.1**, NOAA determined that impacts to water quality would be minor and mostly beneficial through management plan activities designed to improve water quality by removing and avoiding deposition of marine debris. Temporary and negligible adverse impacts to sediment and water quality, such as increased turbidity, may occur in implementation of beneficial use habitat protection and restoration projects. However, any future beneficial use project would be subject to sanctuary permit and/or authorization requirements; an assessment by ONMS of the suitability of the sediment to ensure that it matches the physical properties of native sediments at any planned receiving sites and meets sanctuary water quality objectives; a project-specific environmental review; and permitting and review by other federal, state, and local agencies, as appropriate. During vessel operations, MBNMS minimizes potential water quality degradation through implementation of its environmental compliance procedures, best management practices, and spill prevention control and countermeasures plan. ONMS does not expect that implementing the proposed action would result in an increase in vessel operations conducted by MBNMS in the sanctuary. As a result, adverse effects on water quality in the action area resulting from the proposed action are expected to be highly unlikely. Therefore, impacts to listed birds associated with changes in water quality that might affect their foraging habitat would be **discountable**.

5.5.1.2 Impacts on Marine Mammals and Sea Turtles

ONMS determined that one species of marine mammal (southern sea otters) under USFWS jurisdiction would occur within the action area and may be affected by the proposed action. Potential impacts to southern sea otters include disturbance resulting from human activities, entanglement, vessel strike, and potential adverse impacts to water quality resulting from routine field activities. Beneficial impacts would result from sanctuary management activities, including resource protection and stewardship activities, aimed at protecting foraging habitats and improving water quality in MBNMS.

The southern sea otter is a year-round resident of MBNMS. It is a top carnivore in its coastal range and a keystone species of the nearshore coastal zone, often found foraging and resting in kelp forests. Southern sea otters are commonly found in the nearshore waters of Monterey Bay, along the Big Sur coastline and in Elkhorn Slough. Southern sea otter is listed as threatened under the ESA and is also protected under the MMPA. No listed sea turtle species are known to nest on shorelines adjacent to MBNMS.

Human Disturbances

Within MBNMS, human disturbance likely to affect southern sea otters is limited to routine field activities to support management of the sanctuary that may pose a risk of entanglement, vessel strike, or disturbance. These specific activities are: vessel operations, deployment of AUVs or ROVs, scuba and snorkel operations, non-motorized craft, and other resource protection or sampling activities occurring in the water or onshore.

If any listed species were to be in close proximity of vessels transiting the sanctuary, there is the possibility that the interaction could result in a range of reactions ranging from no reaction to a startled reaction, such as a rapid fleeing from the area. This reaction could also occur in response to divers operating in the sanctuary, and deployment of ROVs or other underwater or surface vehicles or instrumentation in close proximity to listed species. When conducting these types of routine field activities, staff are highly trained to implement NOAA policies and ONMS best management practices, and minimize risks to listed species by maintaining a safe distance between themselves and any marine mammals present. In addition, MBNMS activities are expected to be of low intensity and frequency. ONMS does not expect that implementing the proposed action would result in an increase in field activities conducted by MBNMS staff in the sanctuary. Therefore, ONMS determined the chances of disturbance of southern sea otters resulting from vessel operations or other routine field activities is **discountable**. Additionally, because no species of listed sea turtles are expected to nest or forage on shorelines adjacent to MBNMS, routine onshore fieldwork, including removal of grounded vessels and other marine debris, and onshore water monitoring or sampling are expected to have **no effect** on listed sea turtles.

Vessel anchoring and tethers used by ROVs or other instrumentation can pose an entanglement risk for listed marine mammals. If they occur, entanglements can cause physical damage to an animal through constriction which can partially sever limbs or flippers, create penetrating injuries, and can potentially immobilize an animal (Andersen et al., 2008; Parga, 2012). If an entanglement is severe enough, it may also result in drowning. MBNMS staff follow best management practices for working in the vicinity of marine animals during fieldwork, including maintaining a watch for listed species around the vessel and terminating some operations if animals are spotted. Based on these practices and on the wide range of species distribution and abundance patterns, the chance that an individual from a listed species would come in contact with a vessel or other MBNMS gear is highly unlikely. Therefore, ONMS determined that the likelihood of an entanglement of a listed marine mammal under USFWS jurisdiction would be **discountable**.

Similarly, operations of vessels by MBNMS could result in injury to an individual if the MBNMS vessel collided with a listed marine mammal. To minimize the risk of these potential adverse impacts, MBNMS vessels follow ONMS standing orders within the sanctuary and while transiting between sites or from/to shore, which include keeping a sharp lookout, staying at the helm, and maintaining a cautious distance from protected species. Due to the implementation of these best management practices, the potential for the proposed action to result in vessel strikes of listed marine mammals is **discountable**.

Changes to Water Quality

As discussed above in **Sections 5.2.1, 5.3.1, and 5.4.1**, ONMS determined that impacts to water quality would be minor and mostly beneficial through management plan activities designed to improve water quality by removing and avoiding deposition of marine debris. Temporary and negligible adverse impacts to sediment and water quality, such as increased turbidity, may occur in implementation of beneficial use habitat protection and restoration projects. However, any future beneficial use project would be subject to sanctuary permit and/or authorization requirements; an assessment by ONMS of the suitability of the sediment to ensure that it matches the physical properties of native sediments at any planned receiving sites and meets sanctuary water quality objectives; a project-specific environmental review; and permitting and review by other federal, state, and local agencies, as appropriate. During vessel operations, MBNMS minimizes potential water quality degradation through implementation of its environmental compliance procedures, best management practices, and spill prevention control and countermeasures plan. ONMS does not expect that implementing the proposed action would result in an increase in vessel operations conducted by MBNMS in the sanctuary. As a result, adverse effects on water quality in the action area resulting from the proposed action are expected to be highly unlikely. Therefore, impacts to listed marine mammals associated with changes in water quality that might affect their foraging habitat would be **discountable**.

5.5.1.3 Impacts on Amphibians

ONMS determined that one species of amphibian (California red-legged frog) under USFWS jurisdiction occurs within the action area and could be affected by the proposed action. Potential impacts to California red-legged frogs include disturbance resulting from water sampling activities in streams draining to MBNMS during the annual Snapshot Day water sampling event led by MBNMS. This activity is led by highly-trained staff who guide trained volunteers in collecting water samples at a variety of upstream locations in San Mateo, Monterey, Santa Cruz, and San Luis Obispo counties. California red-legged frogs are occasionally observed in these upstream environments. However, the likelihood of occurrence of the threatened California red-legged frog in the action area during the annual Snapshot Day activities in May each year is low. If the species were to be present, sampling activity in the stream or transiting adjacent habitat could cause disturbance or injury to the species. To avoid such impacts, staff and volunteers would take all possible steps to avoid disturbing any California red-legged frogs if they were observed in the area of activity. In addition, the annual event takes place in May, which is outside the critical breeding season for the California red-legged frog (November through April). Therefore, the proposed action is expected to have **discountable** impacts on California red-legged frogs.

5.5.1.4 Effects Determination for Species Under USFWS Jurisdiction

NOAA ONMS determined that five listed species under the jurisdiction of USFWS may occur within the action area, and found that the proposed action **may affect, but is not likely to adversely affect** those listed species for the following reasons:

1. The updated MBNMS management plan includes routine field activities as described in the 2008 management plan. Because these activities have been implemented for 12 years

resulting in negligible impacts to listed species, we do not expect a change in impacts to the listed species.

2. Noise and disturbance to southern sea otter and marbled murrelets from MBNMS-led vessels would occur infrequently and ONMS staff would implement best management practices, such as a biological monitor on watch and reducing speeds around marine mammals, to minimize potential impacts.
3. The majority of the field activities conducted by NOAA staff would be of limited duration, management activities include measures to reduce disturbance, and implementation of best management practices would minimize potential impacts.
4. Surveys that may result in impacts to California red-legged frogs and its critical habitat, tidewater goby and its critical habitat, and marbled murrelet critical habitat would occur over the course of one day per year and would be completed within four hours. Additionally, these activities would occur in May and would be outside of the breeding season for California red-legged frogs.

The USFWS concurred with this determination based by a letter dated February 26, 2021 (see Appendix D).

5.5.2 Impacts on Critical Habitat Under USFWS Jurisdiction

As described in **Section 4.3.1** and **Appendix D**, NOAA ONMS determined that designated critical habitat for four species under USFWS jurisdiction may occur within the action area (marbled murrelet, western snowy plover, California red-legged frog, and tidewater goby). ONMS analyzed the potential beneficial and adverse impacts to these designated critical habitats due to human disturbance and habitat loss or degradation as a result of the proposed action.

Impacts on Designated Critical Habitat for Marbled Murrelet

The likelihood of the marbled murrelet being present in MBNMS is low, and when they do occur it is in small flocks on coastal waters when diving underwater to feed on fish. Essential features of the designated critical habitat for the ESA-threatened marbled murrelet are forested areas containing characteristics of older growth forests (81 FR 51348). This type of habitat occurs along the shorelines adjacent to the sanctuary. MBNMS does not conduct any activities in forests that contain these essential features, therefore ONMS determined that the proposed action would have **no effect** on the essential features of designated critical habitat for marbled murrelet.

Impacts on Designated Critical Habitat for Western Snowy Plover

The ESA-threatened western snowy plover may be found on shorelines within the action area. Designated critical habitat for the western snowy plover is found along the entire coastline adjacent to the sanctuary. Essential features provided by this critical habitat include: sparsely vegetated areas above daily high tides, such as salt pans, artificial salt ponds, and adjoining levees, for nesting and foraging; sandy beach above and below the high tide line for nesting and foraging; and surf-cast debris to attract small invertebrates (77 FR 36727). Nesting occurs from March to September. Onshore fieldwork activities conducted by staff may occur along coastal beaches that provide nesting and foraging habitat for the western snowy plover. However, ONMS expects that marine debris monitoring and collection, response to vessel groundings, and

citizen science activities would be short in duration, occur infrequently, and cause only minor impacts to the essential features of critical habitat for the western snowy plover. Therefore, the proposed action would have **no effect** on western snowy plover designated critical habitat.

Impacts on Designated Critical Habitat for the California Red-Legged Frog

Snapshot Day water sampling occasionally occurs in streams where designated critical habitat for the California red-legged frog is present. The primary constituent elements for designated critical habitat for the California red-legged frog are aquatic breeding habitat, aquatic non-breeding habitat, upland habitat, and dispersal habitat (75 FR 12816). These essential features are present in the MBNMS action area. However, because the activities that would occur in areas of critical habitat for the California red-legged frog are highly infrequent (one day per year outside of breeding season, less than four hours in duration, and volunteers would not go in the water), ONMS expects that impacts to critical habitat for the California red-legged frog would be temporary and minor. Therefore, the proposed action **is not likely to result in adverse effects** to California red-legged frog designated critical habitat.

Impacts on Designated Critical Habitat for Tidewater Goby

Designated critical habitat for the endangered tidewater goby overlaps with rivers in the action area where MBNMS conducts annual water sampling as part of Snapshot Day. The primary constituent elements for designated critical habitat for tidewater goby are: persistent, shallow, still-to-slow moving lagoons, estuaries, and coastal streams that contain substrates suitable for the construction of burrows for reproduction, submerged and emerged aquatic vegetation that provides protection from predation and high flow events, or presence of a sandbar across the mouth of a lagoon or estuary during the late spring, summer, and fall providing relatively stable water levels and salinity (78 FR 8745). These essential features are present in the portions of the action area where Snapshot Day activities are conducted; however, ONMS does not expect that these activities would have any effect on these essential features. Any sampling conducted by volunteers would be limited in duration and would not impact water quality or quantity or substrate. Furthermore, because the activities that would occur in areas of critical habitat for the tidewater goby are highly infrequent (one day per year, less than four hours in duration, and the volunteers would not enter the water), ONMS expects that impacts to critical habitat for these species would be temporary and minor. Therefore, the proposed action **is not likely to result in adverse effects** to tidewater goby or their designated critical habitat.

5.5.3 Impacts on Species Under NMFS Jurisdiction

As described in **Section 4.3.1** and **Appendix D**, ONMS determined that the following 23 ESA-listed or candidate species under NMFS jurisdiction may occur within the action area and may be affected by the proposed action: black abalone, Sacramento River Winter-Run Chinook salmon, Central Valley Spring-Run Chinook salmon, California Coastal Chinook salmon, Central California Coast coho salmon, Central California Coast steelhead, South Central California Coast steelhead, North American green sturgeon Southern DPS, longfin smelt, eulachon, leatherback sea turtle, green sea turtle, loggerhead sea turtle, olive ridley sea turtle, Guadalupe fur seal, blue whale, humpback whale, fin whale, sperm whale, killer whale, Western North Pacific gray whale, North Pacific right whale, and sei whale. ONMS analyzed the potential beneficial and adverse impacts to these species due to human disturbance, habitat loss, or degradation associated with

the proposed action. The analysis is based on best available scientific and commercial information.

5.5.3.1 Impacts on Marine Mammals and Sea Turtles

ONMS determined that four species of ESA-listed sea turtles and nine species of ESA-listed marine mammals may occur within the action area and may be affected by the proposed action: leatherback sea turtle, green sea turtle, loggerhead sea turtle, olive ridley sea turtle, Guadalupe fur seal, blue whale, humpback whale, fin whale, sperm whale, killer whale, Western North Pacific gray whale, North Pacific right whale, and sei whale. Potential impacts to marine mammals and sea turtles include disturbance resulting from human activities, entanglement, vessel strike, and potential adverse impacts to water quality resulting from routine field activities. Beneficial impacts would result from sanctuary management plan activities, including resource protection and stewardship activities, aimed at protecting foraging habitats, minimizing wildlife disturbance, and improving water quality in MBNMS.

The East Pacific DPS of green sea turtle is listed as threatened under the ESA. They are infrequently observed in the action area, most commonly occurring around San Diego, California and further south to Baja California, Mexico, and other tropical regions. When they do occur in MBNMS, it is during periods of warm water in the offshore pelagic environment or occasionally in nearshore environments. Leatherback and loggerhead sea turtles are listed as endangered under the ESA and are occasionally found in the action area. They are most often associated with the offshore pelagic environment in tropical regions, but can occasionally be found quite close to shore in California. Leatherback sea turtles are most common in MBNMS between July and October, when surface waters are warmer and large jellyfish are abundant offshore. Olive ridley sea turtle is not expected to be found in the action area. They are a highly migratory species and their range in the eastern Pacific Ocean extends from southern California to northern Chile.

Humpback whales are common in MBNMS, occurring in the action area from late April to early December to feed in coastal California waters. The central California humpback whale stock primarily includes whales from the endangered Central American DPS and the threatened Mexico DPS. The ESA-threatened Guadalupe fur seal is not known to regularly haul out or breed in MBNMS, but it is occasionally observed foraging and swimming in the waters of Monterey Bay. They breed along the eastern coast of Guadalupe Island, approximately 200km west of Baja California, Mexico. The ESA-endangered North Pacific right whale and sei whale have been observed very rarely in the action area. Sei whales are typically sighted in offshore waters, generally in deep water habitats along the edge of the continental shelf or in the open ocean, seaward of the western boundary of MBNMS. North Pacific right whale is seasonally migratory and not known to breed or calve in the action area. The ESA-endangered sperm whale rarely occurs in the action area, spending most of its time in deeper offshore waters. The ESA-endangered blue whale, fin whale, and killer whale have a moderate likelihood of occurrence in the action area. Blue whales occur in the action area between June and October, typically near the edges of the submarine canyon and shelf-break edges where high abundance of krill are found. Fin whales are occasionally encountered during the summer and fall in Monterey Bay, but are typically observed farther offshore in deep waters during their migration from Arctic and Antarctic feeding areas in the summer to tropical breeding and calving areas in the winter. Killer

whales are most common in MBNMS during April to June when they feed on northbound migrating gray whales. They are generally a transient species observed throughout coastal California. The Southern Resident DPS occurs mainly in Washington state and southern British Columbia, but occasionally also in coastal waters from Southeast Alaska to California. The Western North Pacific gray whale has a low potential to occur in coastal waters during late fall-winter southward migration and again late winter to early summer during their northward migration.

Human Disturbances

Within MBNMS, human disturbance likely to affect listed marine mammals and sea turtles is limited to field activities to support management of the sanctuary that may pose a risk of entanglement, vessel strike, or disturbance. These specific activities are: vessel operations, aircraft operations, deployment of AUVs or ROVs, scuba and snorkel operations, non-motorized craft, and other resource protection or sampling activities occurring in MBNMS.

If any listed marine mammals or sea turtles were to occur in close proximity to vessels transiting the sanctuary, there is the possibility that the interaction could result in a range of reactions ranging from no reaction to a startled reaction, which could result in a rapid fleeing from the area. This reaction could also occur in response to divers operating in the sanctuary and deployment of ROVs, or other underwater or surface vehicles or instrumentation (e.g., buoys and hydrophones), in close proximity to listed species. When conducting these types of routine field activities, staff are highly trained to implement NOAA policies and ONMS best management practices and standing orders, and minimize risks of disturbance by maintaining a safe distance between themselves and any marine mammals or sea turtles present. In addition, MBNMS field activities are expected to be of low intensity and frequency. ONMS does not expect that implementing the proposed action would result in an increase in field activities conducted by MBNMS. Therefore, ONMS determined the chances of disturbance of marine mammals or sea turtles resulting from vessel operations or other routine field activities is **discountable**.

Vessel anchoring and tethers used by ROVs or other instrumentation can pose an entanglement risk for listed marine mammals and sea turtles. If they occur, entanglements can create physical damage to an animal through constriction which can partially sever limbs or flippers, create penetrating injuries, and can potentially immobilize an animal (Andersen et al., 2008; Parga, 2012). If an entanglement is severe enough, it may also result in drowning. Based on the wide range of species distribution and abundance patterns, adherence to best management practices by staff during fieldwork, including maintaining a watch for listed species around the vessel and termination of some operations if animals are spotted, the chance that an individual from a listed species would come in contact with a vessel or other MBNMS gear would be highly unlikely. Therefore, NOAA determined that the likelihood of an entanglement of a listed marine mammal or sea turtle species under NMFS jurisdiction would be **discountable**.

Similarly, operations of vessels by MBNMS could result in injury to an individual if the vessel collided with a listed marine mammal or sea turtle. Vessel captains operate with sensitivity to avoid disturbance or injury to marine life. Vessel captains are trained to watch for marine mammals and sea turtles and take appropriate steps to avoid disturbance or collision. Best management practices, including maintaining lookouts for protected species, interacting with

other vessel operators, receiving real time survey information on the locations and concentration of marine mammals in particular, reducing speeds, and maintaining safe distances would be exercised. Due to the implementation of these best management practices, the potential for the vessel operations to impact listed marine mammal and sea turtle species is **discountable**.

Occasionally, vessels are deployed to respond to and rescue whales entangled in fishing gear or buoy lines. This requires a rib to be launched and brought proximate to the entangled animal in order to cut and release the lines. This activity is allowed under NMFS Marine Mammal Stranding Network permits for highly trained personnel to approach and disentangle whales, including humpback, blue, fin, and gray whales. In addition, activities conducted by MBNMS that would involve the use of acoustic equipment or aircraft operations would be permitted individually by the MBNMS superintendent and evaluated at that time for potential impacts to listed marine mammals and other protected species.

Additionally, MBNMS proposes to implement regulatory changes that would reconfigure zones for motorized personal watercraft operations as well as management plan activities to minimize wildlife disturbance that would have **beneficial** effects on listed marine mammals and sea turtles.

Changes to Water Quality

As discussed above in **Sections 5.2.1, 5.3.1, and 5.4.1**, NOAA determined that impacts to water quality from the proposed action would be minor and mostly **beneficial** through management plan activities designed to improve water quality by removing and avoiding deposition of marine debris. Temporary and negligible adverse impacts to sediment and water quality, such as increased turbidity, may occur in implementation of beneficial use habitat protection and restoration projects. However, any future beneficial use project would be subject to sanctuary permit and/or authorization requirements; an assessment by ONMS of the suitability of the sediment to ensure that it matches the physical properties of native sediments at any planned receiving sites and meets sanctuary water quality objectives; a project-specific environmental review; and permitting and review by other federal, state, and local agencies, as appropriate. During vessel operations, MBNMS minimizes potential water quality degradation by implementing environmental compliance procedures, best management practices, and spill prevention control and countermeasures plan. ONMS does not expect that implementing the proposed action would result in an increase in vessel operations. As a result, adverse effects on water quality in the action area resulting from the proposed action are expected to be highly unlikely. Therefore, impacts to listed marine mammals or sea turtles associated with changes in water quality that might affect their foraging habitat would be **discountable**.

5.5.3.2 Impacts on Fish

ONMS determined the following ESA-listed or candidate fish species, DPS, or ESU under NMFS jurisdiction may occur within the action area and could be affected by the proposed action: Sacramento River Winter-Run Chinook salmon, Central Valley Spring-Run Chinook salmon, California Coastal Chinook salmon, Central California Coast coho salmon, Central California Coast steelhead, South Central California Coast steelhead, North American green sturgeon Southern DPS, longfin smelt, and eulachon. Potential impacts to listed fish include disturbance

resulting from human activities and potential adverse impacts to water quality resulting from routine field activities. Beneficial impacts would be due to sanctuary management plan and regulatory actions, including resource protection and stewardship actions to protect foraging habitats, minimize wildlife disturbance, and improve water quality in MBNMS.

Three ESUs of Chinook salmon occasionally transit through and forage in the waters of Monterey Bay during migration periods to the Sacramento River. These are the endangered Sacramento River Winter-Run ESU, the threatened Central Valley Spring-Run ESU, and the threatened California Coastal ESU. Chinook salmon typically enter the Sacramento River from November to June and inhabit nearshore coastal waters to central California throughout the year.

One ESU of coho salmon may occur in the waters adjacent to the action area during annual migration. The endangered Central California Coast ESU rears and feeds in streams and small freshwater tributaries, before spending the remainder of their life cycle foraging in estuarine and marine waters off California. Runs were common in the Pajaro and Salinas rivers, but have not been observed since the 1990s. Two small runs exist in the Carmel and Big Sur rivers.

Two ESUs of steelhead occasionally use the waters of MBNMS and nearby streams or estuarine environments. These are the threatened Central California Coast ESU and the threatened South Central California Coast ESU. The South Central California Coast ESU occupies rivers from the Pajaro River in Santa Cruz County up to, but not including, the Santa Maria River in Santa Barbara County.

The likelihood of occurrence of the threatened Southern DPS of green sturgeon in the action area is moderate. The Southern DPS typically occupies coastal bays and estuaries from Monterey Bay, California to Puget Sound in Washington and occasionally enter coastal estuaries to forage. Subadult and adult green sturgeon use Monterey Bay as a feeding ground.

The likelihood of occurrence of ESA-threatened eulachon and ESA-candidate longfin smelt in the action area is low. Monterey Bay is the southernmost limit of the species distribution for eulachon, which tend to spawn and rear in estuarine river habitat, and then migrate to saltwater where they spend three years. Longfin smelt is an anadromous estuarine species occupying the middle or bottom of the water column. The San Francisco Bay-Delta DPS of longfin smelt is an ESA candidate species. This DPS is considered to be the southernmost population for the species, and they are very rarely observed in the action area.

Impacts of Annual Upstream Water Sampling Activities

MBNMS staff and volunteers conduct water sampling activities in streams draining to MBNMS during the annual Snapshot Day water sampling event. This activity is led by highly-trained staff who guide trained volunteers in collecting water samples at a variety of upstream locations in San Mateo, Monterey, Santa Cruz, and San Luis Obispo counties. Listed fish species are occasionally observed in these upstream environments. However, the likelihood of their occurrence in the action area during the annual Snapshot Day activities in May each year is low. If the species were to be present, sampling activity in streams could cause disturbance or injury to the species and minor disturbance of stream habitat. To avoid such impacts, staff and volunteers would take all possible steps to avoid disturbing listed species observed in the area of

activity. Therefore, the proposed action is expected to have **discountable** impacts on listed fish species.

Human Disturbance

If any listed fish species were to occur in proximity to vessels transiting the sanctuary, or humans conducting sampling or monitoring in the action area, there is the possibility that the interaction could result in a range of reactions ranging from no reaction to a startled reaction, such as a rapid fleeing from the area. This reaction could also occur in response to divers operating in the sanctuary and deployment of ROVs, or other underwater or surface vehicles or instrumentation (e.g., buoys and hydrophones), in close proximity to listed species. When conducting these types of routine field activities, staff are highly trained to implement NOAA policies and ONMS best management practices and standing orders, and minimize risks to listed species. Field activities are expected to be of low intensity and frequency. ONMS does not expect that implementing the proposed action would result in an increase in field activities conducted in the sanctuary. In addition, due to their movements and size, the risk of collision and entanglement for fish is much smaller than it is for marine mammals or sea turtles. Therefore, ONMS determined the impacts of human disturbance on listed fish resulting from vessel operations or other routine field activities would be **discountable**.

Changes to Water Quality

As discussed above in **Sections 5.2.1, 5.3.1, and 5.4.1**, NOAA determined that impacts to water quality from the proposed action would be minor and mostly **beneficial** through updated regulations and management plan activities designed to improve water quality by removing and avoiding deposition of marine debris. Temporary and negligible adverse impacts to sediment and water quality, such as increased turbidity, may occur in implementation of beneficial use habitat protection and restoration projects. However, any future beneficial use project would be subject to sanctuary permit and/or authorization requirements; an assessment by ONMS of the suitability of the sediment to ensure that it matches the physical properties of native sediments at any planned receiving sites and meets sanctuary water quality objectives; a project-specific environmental review; and permitting and review by other federal, state, and local agencies, as appropriate. During vessel operations, ONMS minimizes potential water quality degradation through implementation of environmental compliance procedures, best management practices, and spill prevention control and countermeasures plan. ONMS does not expect that implementing the proposed action would result in an increase in vessel operations. As a result, adverse effects on water quality in the action area resulting from the proposed action are expected to be highly unlikely. Therefore, impacts to listed fish associated with changes in water quality that might affect their foraging habitat would be **discountable**.

5.5.3.3 Impacts on Marine Invertebrates

ONMS determined that one species of marine invertebrate (black abalone) under NMFS jurisdiction occurs within the action area and may be affected by the proposed action. Potential impacts to black abalone from the proposed action include onshore fieldwork or other routine field activities that might disturb rocky substrate or have adverse impacts on water quality. Additionally, management plan activities to restore black abalone habitat may have beneficial effects on the endangered species.

Black abalone could be present on hard substrate areas of the nearshore or intertidal environments in the action area. Bedrock along exposed rocky shores provide deep, protective crevices for shelter for black abalone. Black abalone may be minimally affected by sanctuary management activities, such as onshore field activities in the intertidal zone to respond to vessel groundings, conduct research and monitoring, and citizen science activities, as well as other activities that may temporarily disturb rocky substrate in the coastal environment or affect water quality. Grounded vessel removal may also have a temporary adverse impact on a small area of black abalone because there is the potential for chemical seepage and habitat disturbance during the removal and, if needed, remediation processes, and there could be a slight, temporary localized increase in turbidity. NOAA staff are highly trained to implement BMPs and avoid protected species and sensitive habitat during emergency response and salvage operations. Installation of zone marker buoys proposed as part of the proposed action would occur offshore and therefore outside of black abalone habitat. Additionally, any deployment of equipment on the seafloor may cause localized and temporary increase in water turbidity during the installation process.

Temporary and negligible adverse impacts to sediment and water quality, such as increased turbidity, may occur in implementation of beneficial use habitat protection and restoration projects. However, any future beneficial use project would be subject to sanctuary permit and/or authorization requirements; an assessment by ONMS of the suitability of the sediment to ensure that it matches the physical properties of native sediments at any planned receiving sites and meets sanctuary water quality objectives; a project-specific environmental review; and permitting and review by other federal, state, and local agencies, as appropriate. During vessel operations, ONMS minimizes potential water quality degradation through implementation of environmental compliance procedures, best management practices, and spill prevention control and countermeasures plan. ONMS does not expect that implementing the proposed action would result in an increase in vessel operations conducted in the sanctuary. As a result, adverse effects on water quality resulting from the proposed action are expected to be highly unlikely. Additionally, the impacts on black abalone from field activities in the intertidal zone along coastal beaches of MBNMS are expected to be **discountable** because of the infrequent occurrence of these activities and the implementation of best management practices. Effects on black abalone from onshore field activities are expected to be insignificant and effects on black abalone related to water quality are expected to be discountable.

5.5.3.4 Effects Determination for Species Under NMFS Jurisdiction

NOAA ONMS determined that 22 federally listed species under the jurisdiction of NMFS may occur within the action area and that any impacts on these species from the implementation of a new MBNMS management plan and proposed regulations would be beneficial, insignificant, or discountable for the following reasons:

1. Noise and disturbances from sanctuary operational activity would be of limited duration, management activities would strive to reduce disturbance, and implementation of best management practices would minimize potential impacts.
2. The revisions to the MBNMS management plan and MBNMS regulations would have a beneficial impact on listed species because they would continue to protect important

foraging and breeding grounds within coastal and shoreline habitats and contribute to improvements in water quality.

Based on the above information, ONMS finds that the proposed action **may affect, but is not likely to adversely affect** listed species under NMFS jurisdiction.

Based on this analysis of impacts to ESA-listed species, NOAA ONMS determined the proposed action would not cause the take of any marine mammal protected under the MMPA. Should ONMS conduct, permit, or authorize any future activities that would cause the take of any marine mammal protected under the MMPA, NOAA ONMS would evaluate the environmental impacts from such activities on a case-by-case basis.

5.5.4 Impacts on Critical Habitat Under NMFS Jurisdiction

As described in **Section 4.3.1** and **Appendix D**, ONMS determined that designated critical habitat for four species under NMFS jurisdiction may occur within the action area and may be affected by the proposed action (green sturgeon Southern DPS, three DPS of salmon, and steelhead, black abalone, and leatherback sea turtle). In addition, designated critical habitat for two species of humpback whale distinct population segments (DPS) including the endangered Central America DPS, and the threatened Mexico DPS occur within the action area. Lastly, the proposed revisions to southern resident killer whale critical habitat occurs within the action area. ONMS analyzed the potential beneficial and adverse impacts to these designated critical habitats due to human disturbance and habitat loss or degradation associated with the proposed action.

Impacts on Designated Critical Habitat for Leatherback Sea Turtle

ESA-endangered leatherback turtles are occasionally observed in the MBNMS action area, most commonly between July and October when large jellyfish, the primary prey of the species, are seasonally abundant offshore. Designated critical habitat for the leatherback sea turtle is found along the entire coastline adjacent to MBNMS, extending from Point Arena in the north to Point Arguello in the south. The one primary constituent element essential for the conservation of leatherback in marine waters off the U.S. West Coast is the occurrence of prey species, primarily jellyfish of the order Semaestomeae, of sufficient condition, distribution, diversity, abundance, and density necessary to support individual as well as population growth, reproduction, and development of leatherback (77 FR 4169). This essential feature is present in the action area. However, the activities that MBNMS proposes to conduct (routine field activities and revisions to management plan activities and regulations) would not result in any change in the condition, distribution, diversity, abundance, or density of jellyfish occurring in the action area as prey for leatherbacks. Therefore, the proposed action would have **no effect** on designated critical habitat for leatherback sea turtles.

Impacts on Designated Critical Habitat for Salmon and Steelhead

Designated critical habitat for the endangered California Coastal ESU of coho salmon and threatened Central California Coast and South Central California Coast DPS of steelhead overlaps with rivers in the action area where MBNMS conducts annual water sampling as part of Snapshot Day. Essential habitat types for the ESUs of salmon and steelhead can be generally described to include the following: (1) juvenile rearing areas; (2) juvenile migration corridors;

(3) areas for growth and development to adulthood; (4) adult migration corridors; and (5) spawning areas. Within these areas, essential features of critical habitat include adequate: (1) substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) safe passage conditions (65 FR 7764).

These essential features are present in the portions of the action area where Snapshot Day activities are conducted, however, ONMS does not expect that these activities would have any effect on these essential features. Any sampling conducted by MBNMS volunteers would be limited in duration and would not impact water quality or quantity or substrate. Furthermore, because the activities that would occur in areas of critical habitat for the California Coastal ESU of coho salmon, Central California Coast DPS of steelhead and South Central California Coast DPS of steelhead are highly infrequent (one day per year, less than four hours in duration), ONMS expects that that impacts to critical habitat for these species would be temporary and minor. Therefore, the proposed action would have **insignificant** effects on designated critical habitat for these three DPS of salmon and steelhead.

Impacts on Designated Critical Habitat for Green Sturgeon Southern DPS

Designated critical habitat for the Southern DPS of North American green sturgeon overlaps with the action area, encompassing all marine waters within 60 fathoms depth from Monterey Bay, California. The primary constituent elements essential for the conservation of the Southern DPS in coastal marine areas include: a migratory pathway for the safe and timely passage of fish within marine and between estuarine and marine habitats; coastal marine waters with adequate dissolved oxygen levels and acceptably low levels of contaminants; and abundant prey items for subadults and adults, which may include benthic invertebrates and fish (74 FR 52299). These essential features are present in the MBNMS action area. However, the activities that MBNMS proposes to conduct (routine field activities and revisions to management plan activities and regulations) would not result in any change in these essential features. Therefore, the proposed action would have **no effect** on designated critical habitat for the Southern DPS of North American green sturgeon.

Impacts on Designated Critical Habitat for Black Abalone

Designated critical habitat for black abalone along the California coast includes approximately 360 square km of rocky intertidal and subtidal habitat within five segments of the California coast between the Del Mar Landing Ecological Reserve to the Palos Verdes Peninsula, as well as on the Farallon Islands, Año Nuevo Island, San Miguel Island, Santa Rosa Island, Santa Cruz Island, Anacapa Island, Santa Barbara Island, and Santa Catalina Island. This designation includes rocky intertidal and subtidal habitats from the mean higher high water (MHHW) line to a depth of -6 meters (m) (relative to the mean lower low water (MLLW) line), as well as the coastal marine waters encompassed by these areas (76 FR 66805). This critical habitat encompasses the coastline of MBNMS except for Monterey Bay. The primary constituent elements essential for the conservation of black abalone are: suitable rocky substrate occurring from MHHW to a depth of -6m relative to MLLW; abundant food resources, including bacterial and diatom films, crustose coralline algae, and a source of detrital macroalgae, for growth and survival of all stages of black abalone; juvenile settlement habitat in rocky intertidal and subtidal habitat containing crustose coralline algae and crevices or cryptic biogenic structures (e.g.,

urchins, mussels, chiton holes, conspecifics, and anemones); suitable water quality; and suitable nearshore circulation patterns. These essential features are present in the action area.

These primary constituent elements may be minimally affected by some sanctuary management activities, such as onshore field activities in the intertidal zone to respond to vessel groundings, conduct research and monitoring, and citizen science activities, as well as other activities that may temporarily disturb rocky substrate in the coastal environment or adversely affect water quality. Grounded vessel removal may have a temporary adverse impact on water quality because there is the potential for chemical seepage and habitat disturbance during the removal and, if needed, remediation processes, and there could be a slight, temporary localized increase in turbidity. NOAA staff are highly trained to implement best management practices and avoid protected species and sensitive habitat during emergency response and salvage operations.

ONMS expects that management activities, including marine debris monitoring and collection, response to vessel groundings, and citizen science activities in the intertidal zone contributing to seafloor disturbance or changes in water quality would be short in duration, occurring infrequently, and cause only minor impacts to the essential features of rocky substrate and water quality for the black abalone. Therefore, the proposed action would have **insignificant** effects on designated critical habitat for black abalone.

Impacts on Designated Critical Habitat for the Humpback Whale

NMFS designated critical habitat for the endangered Central America DPS and the threatened Mexico DPS for humpback whales. Critical habitat for these DPSs of highly-migratory species include the waters of MBNMS (84 FR 54354). NMFS identified prey essential habitat features for these DPSs including migratory corridors and ambient soundscape conditions that do not hinder access to prey. Prey availability is specifically defined as primarily euphausiids and small pelagic schooling fishes of sufficient quality, abundance, and accessibility within humpback whale feeding areas to support feeding and population growth. In addition, NMFS identified ocean noise, climate change, direct harvest of the prey by fisheries, and marine pollution as having the potential to negatively impact the essential prey feature and the ability of feeding areas to support the conservation of listed humpback whales in the North Pacific. These essential features are present in the action area. However, the activities that MBNMS proposes to conduct (routine field activities and revisions to management plan activities and regulations) are low in intensity and frequency and would not result in any change in these essential features. Therefore, the proposed action would have **no effect** on proposed designated critical habitat for the humpback whale.

Impacts on Proposed Revisions to Designated Critical Habitat for the Southern Resident Killer Whale

NMFS proposes to revise the critical habitat designation for the southern resident killer whale (*Orcinus orca*) DPS by expanding it to include six new areas along the U.S. West Coast, while maintaining the whales' currently designated critical habitat in inland waters of Washington (84 FR 42914). Specific new areas proposed along the U.S. West Coast include roughly 15,626 square miles of marine waters between the 6.1-meter depth contour and the 200-meter depth contour from the U.S. international border with Canada south to Point Sur, California. NMFS identified essential habitat features as: (1) water quality to support growth and development; (2)

prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth; and (3) passage conditions to allow for migration, resting, and foraging. These essential features are present in the action area. However, the activities that MBNMS proposes to conduct (routine field activities and revisions to management plan activities and regulations) are low in intensity and frequency and would not result in any change in these essential features. Therefore, the proposed action would have **no effect** on proposed designated critical habitat for the southern resident killer whale.

5.5.5 Impacts on Essential Fish Habitat Present in MBNMS

EFH for various life stages of fish species managed under the Pacific Coast Salmon, Pacific Coast Groundfish, Coastal Pelagic Species, and Highly Migratory Species Fishery management plans is located throughout the West Coast, and may be affected by ONMS field activities in MBNMS. More details on the list of EFH present in MBNMS is in **Section 4.3.2**. An adverse effect on EFH is any direct or indirect effect that reduces the quality and/or quantity of habitat. As part of the ONMS Programmatic EA for Field Operations, ONMS prepared an EFH Assessment that analyzed the impacts of routine operational activities on EFH in the national marine sanctuaries on the West Coast. As part of its coordination and consultation with NMFS for the Programmatic EA for Field Operations, ONMS determined that two categories of field operations may adversely affect designated EFH (response to vessel groundings and deployment of equipment on the seafloor). ONMS requested NMFS General Concurrence that these adverse impacts to EFH would be minor because of the relatively small number of days at sea, equipment deployments conducted annually, and the best management practices and training protocols in place for staff and contractors.

By letter dated July 26, 2016, NMFS concurred with ONMS's determination that field operations would have minimal adverse impacts on designated EFH and provided General Concurrence for all field operations, except for removal or relocation of grounded vessels and removal of large marine debris. NMFS agreed that deployment of equipment on the seafloor would meet the criteria for general concurrence under 50 CFR § 600.920(g)(2) provided that the minimization measure of limiting deployment to sandy substrate was followed for all deployments. NMFS stated that the activity of removal or relocation of grounded vessels and removal of large marine debris do not meet the criteria stated in 50 CFR § 600.920(g)(2) and should be consulted on individually as necessary.

This section provides an analysis of the potential impacts of removal of grounded vessels that could occur as part of the proposed action. No other proposed changes to the management plan or regulatory updates would result in activities that would adversely impact EFH. Grounded vessel removal may have a temporary adverse impact on a small area of EFH because there is the potential for chemical seepage and habitat disturbance during the removal and, if needed, remediation processes. Derelict or deserted vessels can release toxic paint, chemicals, and petroleum products among other contaminants from the vessel and matter left aboard the vessel. If disturbed or deteriorating, they can disturb the surrounding benthic habitats, potentially creating plumes of sediment. During vessel removal activities, disturbance to habitat would be minimized, through use of mechanical operations (e.g., boom and skimmer system) so

that plumes would be contained and limited in size and dissipate quickly, therefore not resulting in adverse impacts to EFH. If species associated with EFH were intolerant to the temporary decline in water quality, mobile organisms such as fish could swim to nearby waters that would not be affected by a localized decline in water quality. Any areas with temporarily diminished water quality would likely recover quickly so that nearby habitat and any associated EFH species would not be affected. NOAA would work with the towing and salvage industry to develop a suite of guidelines and best management practices, incorporating relevant U.S. Coast Guard regulations and best management practices (e.g., emergency lightering or subsurface product removal using mechanical operations) and apply the current sanctuary general permit to certain towing and salvage operations.

Therefore, the proposed action would result in minimal adverse effects on designated EFH based on: the temporary increase in turbidity that could occur during removal activities, best management practices developed for certain towing and salvage operations, and the limited number of removal activities occurring annually.

5.6 Cumulative Effects Analysis

The CEQ regulations for implementing the provisions of NEPA define cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 C.F.R. § 1508.7). The regulations further define cumulative impacts as those that can result from individually minor but collectively significant actions that take place over a period of time. The CEQ guidance for considering cumulative effects states that NEPA documents “should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant” (CEQ 1997).

This section presents the methods used to evaluate cumulative impacts, lists projects that may have cumulative effects when combined with the impacts from the proposed action or alternatives discussed in this EA, and describes the potential cumulative impacts of the proposed action.

5.6.1 Cumulative Impact Assessment Methods

CEQ’s cumulative effects guidance sets out several different methods for assessment such as checklists, modeling, forecasting, and economic impact assessment, where changes in employment, income, and population are evaluated (CEQ, 1997). In general, past, present, and future foreseeable projects are assessed by topic area. Cumulative effects may arise from single or multiple actions and may result in additive or interactive effects. Interactive effects may be countervailing, where the adverse cumulative effect is less than the sum of the individual effects, or synergistic, where the net adverse effect is greater than the sum of the individual effects (CEQ, 1997). For the purposes of this analysis, NOAA considered cumulative effects to be significant if they exceed the capacity of a resource (physical, biological, socioeconomic, historic, and/or cultural) to sustain itself and remain productive. The geographic scope and time frame for the cumulative effects analysis are the same as for the management plan review; the existing boundaries of MBNMS and a five to 10 year time frame for implementation. In conducting this

analysis, NOAA used the findings from the 2015 update to the MBNMS Condition Report as a baseline (NOAA ONMS, 2015).

The projects in Table 6 are currently occurring or are anticipated to occur in the reasonably foreseeable future within the study area. NOAA considered the effects of these actions in combination with the impacts of the proposed action to determine the overall cumulative impact on the resources discussed in Chapter 4.

5.6.2 Past, Present, and Reasonably Foreseeable Future Projects

Table 6. Other Federal and Non-Federal Projects with Potential to Contribute to Cumulative Impacts

Project	Project Location	Project Sponsor	Project Description	Completion Date
General NPDES Permits for Discharges with Low Threat to Water Quality	Throughout MBNMS	Regional Water Quality Control Boards	Multiple permits for many types of waste discharges with very low pollutant content and with no likely adverse effect on water quality, including brine from small desalination facilities to marine waters, flow-through seawater systems (such as aquariums and aquaculture operations), and wastewater treatment facilities.	Ongoing
Advanced Cabled Observatory in the Monterey Bay Canyon	Monterey Bay	Monterey Bay Aquarium Research Institute	Installation of a 31.7-mile long submerged cable, extending from the shore at Moss Landing to the northwest, north of the submarine Monterey Canyon, and along the continental margin to the southeastern part of a shelf slope formation known locally as Smooth Ridge.	Ongoing; through 2030
Monterey Bay Aquarium Pipeline Support Retrofit Project	Monterey Bay	Monterey Bay Aquarium	Retrofit and maintain the aquarium's intake pipelines and support structures to provide a more stable, permanent support, and to minimize maintenance and overall footprint on the seafloor. The project involves revisions to the structural system supporting the intake pipelines by two methods: 1) retrofit of existing concrete blocks, and 2) removal of concrete blocks and replacement with socketed pipes and cross-beams.	Estimated 2 year project once construction begins
Seawall and Shore Armoring Projects	Shorelines adjacent to MBNMS	Individuals or Municipalities	Coastal armoring projects may include simple installation or riprap, construction of cribwalls, or large-scale construction to protect erosion-prone areas of the coastline. Permitting agencies are the counties with jurisdiction for the shorelines and the California Coastal Commission.	Various
Implementation of State Highway Plans, County General Plans, and Local Coastal Plans	Monterey, San Mateo, Marin, and San Francisco counties	State of California (CalTRANS), Monterey, San Mateo, Marin, and San Francisco counties	Counties adjacent or near to MBNMS are in various stages of implementing or updating general plans and local coastal programs. These can include elements on land use, road repair and maintenance, recreation, and infrastructure that are relevant to the sanctuary.	Ongoing
Implementation of Management Activities at Greater Farallones and Cordell Bank National Marine Sanctuaries	Waters adjacent and near to MBNMS	NOAA	NOAA implements regulations and management plan activities at Cordell Bank and Greater Farallones national marine sanctuaries to protect natural resources. Management activities include conducting research, enforcing regulations, and monitoring sanctuary resources.	Ongoing

Project	Project Location	Project Sponsor	Project Description	Completion Date
Various Harbor Dredge and Disposal Activities	Moss Landing Harbor, Moss Landing Beach, Santa Cruz Harbor, Twin Lakes State Beach, Monterey Harbor	Local cities, municipalities, harbor districts adjacent to the sanctuary, and U.S. Army Corps of Engineers	Various ongoing dredge disposal activities at designated sites in MBNMS. Specifics of ongoing activities are described in detail in Section 4.1.2.3 and Table 4. Santa Cruz, Monterey, and Moss Landing harbors conduct regular dredging of the bottom of their harbors and dispose of the bulk of their dredge sediments within MBNMS at four designated dredge disposal sites: SF-12 and SF-14 (offshore sites) and Twin Lakes State Beach and Monterey Harbor (onshore sites).	Ongoing
Beach Nourishment Projects	Various locations on beaches adjacent to MBNMS	Individuals, local cities, municipalities, and harbor districts adjacent to the sanctuary	Some dredged sediment is used for beach nourishment along shorelines adjacent to MBNMS. Nourishment projects have been implemented and are proposed in a number of coastal towns, mainly for the purposes of beach restoration, enhancement, and/or maintenance. Beach replenishment projects currently occur at Del Monte Beach in Monterey, Salinas River, and Moss Landing State beaches at Moss Landing, and Twin Lakes State Beach in Santa Cruz. Summaries of these activities are found in Section 4.1.2.3 and Table 4. Placement of clean dredged material on these beaches has helped stabilize beach profiles at these sites.	Ongoing
Placement and Maintenance of Moorings	Monterey Harbor and additional harbors in or adjacent to the sanctuary	Harbor Masters or Yacht Clubs	Local harbors or yacht clubs adjacent to the sanctuary deploy and maintain moorings for boat operators that may result in minimal disturbance of the seafloor within the sanctuary.	Ongoing
Research Activities of Local and Regional Research Institutes and Organizations	Throughout MBNMS and along shorelines adjacent to the sanctuary	Various, including: NOAA Southwest Fisheries Science Center; National Weather Service; Monterey Bay Aquarium Research Institute; U.S. Geological Survey; University of California, Santa Cruz; Scripps Institution of Oceanography; Naval Postgraduate School; California Department of Fish and Wildlife; Moss Landing Marine Laboratories; and Elkhorn Slough National Estuarine Research Reserve	Research and monitoring activities would generally include the following types of projects occurring throughout the sanctuary: vessel operations; deployment of research equipment (ROVs, AUVs, UAS, hydrophones, gliders, subsurface moorings, and weather buoys); active acoustic equipment; collection of seafloor substrate and other specimens; bottom trawl surveys by NMFS fisheries science centers; aerial photographic surveys; and marine debris removal. These types of activities are generally permitted under the sanctuary's permit authorities with specific terms and conditions applied to minimize any impact on animal and plant life and other sanctuary resources.	Ongoing

Project	Project Location	Project Sponsor	Project Description	Completion Date
Breaching and Diversion of Creeks and Rivers Flowing into the Sanctuary	Along shorelines adjacent to the sanctuary	Varies, including: City of Capitola, Monterey County, California State Parks; Santa Cruz County Flood Control and Water Conservation District.	Example, Implementation of the Soquel Creek Lagoon Management & Enhancement Plan to protect marine/creek resources while simultaneously enhancing beach access during the summer months at Capitola Beach.	Ongoing
Search and Rescue Training Activities	Throughout MBNMS	Local municipalities and departments of parks and recreation	Operation of motorized personal watercraft (as defined at 15 CFR 922.131) outside of established sanctuary MPWC operating zones for the purposes of emergency response proficiency training, area familiarization, and agency-mandated standby (safety patrols) at scheduled aquatic events.	Ongoing

Table 6 lists the other federal and non-federal actions that could contribute to cumulative impacts. This list was compiled based on the active and pending permits issued by MBNMS, and NOAA staff knowledge of other existing activities occurring in and around the sanctuary. The projects listed in **Table 6** are generally similar in scope and type to the proposed action. These other federal and non-federal actions relate to management and research activities in coastal and offshore environments. The projects expected to contribute to cumulative impacts are likely to have similar types of impacts on the resources within the study area, would affect similar resources to those that are affected by the proposed action, or are large enough to have far-reaching effects on a resource.

As the proposed action for MBNMS is related to management of the sanctuary rather than a specific coastal or offshore development action, the cumulative effects described are related primarily to local and regional management of the environment and resources in and adjacent to the sanctuary. For the purposes of this cumulative effects analysis, NOAA assumed that any of the actions in **Table 6** that have not already been implemented would be approved and implemented within the time period for this analysis.

As described in more detail in the subsections below, NOAA found that the combination of implementation of the alternatives with the actions in **Table 6** would result in cumulative beneficial impacts to the physical, biological, historical and cultural, and socioeconomic settings, as well as to existing human uses of the sanctuary. The proposed action's contribution to any adverse cumulative impacts would be minor.

5.6.3 Cumulative Impacts on the Physical and Biological Setting

The proposed action would not contribute to any significant adverse impacts on habitats, wildlife, protected species, climate, air, or water. NOAA implementation of the proposed action is not expected to result in increased levels of activity occurring within the sanctuary. Other federal and non-federal activities that could contribute to cumulative impacts include commercial shipping, climate change, the increase in invasive species, and other activities described in **Table 6**. Several thousand large commercial vessels (e.g., container vessels, tankers, dry bulk vessels, car carriers, and cruise ships) pass through MBNMS each year en route to California ports. Vessels larger than 300 gross tons typically transit through the sanctuary within one of four recommended tracks established by the International Maritime Organization (IMO) in 2000. The transit of large commercial vessels through the sanctuary creates a risk of injury for marine species through vessel collisions, potential declines in water quality through accidental leaks or discharges, and introduces vessel noise into the marine environment which could disturb marine species. Compared to the large-scale, chronic effects of commercial shipping, the incremental impacts from the proposed action (including sanctuary-led vessel operations) on the biological and physical setting would be negligible. Climate change and the rise in invasive species could also impact biological and physical resources within the sanctuary due to changes in sea level, ocean acidification, and changes in the population for certain species that either increase or decrease depending on changes to their habitat, prey, or other conditions.

Several other organizations, including federal, state, and local government entities, are involved in the protection of marine resources in MBNMS and the entire Pacific Ocean and coastal

region. These organizations, including USFWS and NMFS, conduct research activities aimed at resource protection and regulate activities occurring in this region. For example, NMFS designates Habitat Areas of Particular Concern overlapping with MBNMS boundaries and prohibits certain types of activities in these areas. MBNMS participated in a collaborative process with NMFS to inform modifications to Essential Fish Habitat in this region that were finalized in November 2019. Existing regulation and future management efforts in the region, such as fisheries management plans and associated regulations implemented by the Pacific Fishery Management Council, NMFS, and the California Department of Fish and Game would continue to benefit and protect biological resources in the sanctuary. Similarly, implementation of regulations and management plans at Greater Farallones and Cordell Bank national marine sanctuaries provide additional protection to biological resources in MBNMS. Given that these marine resource protection activities are intended to improve the health of species and ecosystems through improved understanding and knowledge, and that these activities are conducted in a precautionary manner by highly trained professionals, it is highly unlikely that the cumulative effect of these activities would be adverse.

5.6.4 Cumulative Impacts on the Human and Socioeconomic Setting

Table 6 includes several projects that are designed to further research and monitoring in the sanctuary, encourage tourism and recreational opportunities in the region, and support sustainable management of coastal and offshore resources, including fisheries. These projects, in conjunction with the proposed action, would have overlapping beneficial impacts on the tourism industry, commercial fishing and aquaculture, and the research community in the coastal communities adjacent to the sanctuary. Although the actions listed in **Table 6**, in combination with the proposed action, would have positive, beneficial impacts, the incremental impact from the proposed action on human uses or socioeconomic resources in or adjacent to the sanctuary would be less than significant.

5.6.5 Cumulative Impacts on the Historical and Cultural Setting

The proposed action would cause no significant adverse effects on historical and cultural resources. Cumulative effects that could impact historical and cultural resources may include disturbance and physical impacts from research and monitoring activities, including dive or ROV surveys of historic shipwrecks. Ongoing management of the sanctuary and implementation of a revised management plan and regulations would mitigate the intensity of these human use effects through regulatory prohibitions and public outreach, which would lower the risk of damage to the sanctuary's historical and cultural resources. Commercial and recreational fishing in the area may damage cultural and historical resources by entangling fishing gear on a resource. However, as part of implementing the Maritime Heritage Action Plan, the sanctuary would identify resources and share locations with fishers to avoid or minimize the risk of future entanglements.

5.7 Comparison of Alternatives

In this EA, NOAA analyzed the effects on the physical, biological, human/socioeconomic, and historical/cultural settings from three alternatives under consideration. Effects were classified as beneficial or adverse, direct or indirect, and significant or less than significant (as defined in

Section 5.1.2). Additionally, in **Section 5.6**, NOAA analyzed the cumulative effects of the actions proposed under all three alternatives within the context of other federal and non-federal activities occurring in the sanctuary. In all cases, the effects of all three alternatives were found to be less than significant, as summarized in **Table 7** below. This section briefly summarizes the anticipated effects of the actions that would take place under each of the three alternatives on each setting in MBNMS.

Many routine research and monitoring, education and outreach, and resource protection and stewardship activities would continue under all three alternatives. Under alternatives B and C, NOAA would conduct new outreach, education, and collaboration activities with new and existing partners in new topic areas with the goal of addressing new management areas of concern. The scope of proposed activities that would take place under alternatives B and C with the adoption of a revised management plan is summarized in **Section 3.3**.

Alternative A (*Continuing to manage the sanctuary by conducting routine field activities and implementing the 2008 sanctuary management plan and existing sanctuary regulations*) would have overall beneficial effects on the environment as NOAA would gain more information and take actions to better protect resources in MBNMS. In addition, the public would become more informed about the importance of stewardship of sanctuary resources, and damaged resources would be restored, as needed. While there are some adverse effects expected with this alternative, mostly associated with routine field activities, these effects are not expected to be significant and should be short-term or minor in the context of ongoing activities in the sanctuary. Categories of activities identified to have some potential to contribute to cumulative effects include those that could result in seafloor disturbance and noise pollution, as well as vessel operations and routine resource protection activities.

Alternative B (*Continuing to manage the sanctuary by conducting routine field activities, implementing existing sanctuary regulations, and adopting a revised sanctuary management plan*) would have similar types and intensity of beneficial and adverse effects as Alternative A, but would allow NOAA to conduct research, monitoring, and resource protection activities in new focus areas in collaboration with partners and to implement some new types of field operations. The revised management plan would address the absence of climate change considerations in the 2008 sanctuary management plan, outline implementation of coastal erosion and sediment management plans, propose action on marine debris and explore potential needs and impacts related to Sanctuary Ecologically Significant Areas, assessment of motorized personal watercraft zone use, offshore wind energy, and artificial reefs. These new activities would provide additional beneficial impacts not gained under Alternative A to further inform the management and protection of MBNMS resources.

In comparison, **Alternative C** (*Continuing to manage the sanctuary by conducting routine field activities, adopting a revised sanctuary management plan and associated action plans, and revising sanctuary regulations*) would have similar types and intensity of beneficial and adverse effects as Alternative B. In addition, implementing the proposed regulatory changes would provide further benefits to MBNMS resources by strengthening existing regulations to protect physical, biological, and cultural resources from damage associated with zone marker buoy failure and motorized personal watercraft interactions; as well as providing recreational

opportunities and minimizing interactions of these activities with other human uses of MBNMS. Alternative C would also provide additional benefits to users of coastal areas adjacent to the sanctuary by allowing the beneficial use of suitable dredged material from the four adjacent harbors for habitat protection and restoration activities. The placement of suitable dredged material in the sanctuary could result in temporary disturbance to the physical and biological setting during project implementation. These would be short-term effects with long-term benefits, and projects would be evaluated in detail at the time of a permit application.

In summary, the alternatives are sequentially more protective of the resources in MBNMS, while also providing opportunities for improved recreation and public access to the sanctuary and adjacent shorelines. As demonstrated in the analysis of environmental consequences, the continued operation and management of MBNMS (under alternatives A, B, and C), the revision of the sanctuary management plan (under alternatives B and C), and adoption of revised regulations (under Alternative C) would have an overall beneficial effect on resources within the sanctuary. Because the management plan is a broad guidance document, many of these anticipated beneficial effects would be indirect, resulting from MBNMS efforts to 1) improve public understanding of ocean stewardship issues; 2) further scientific understanding of sanctuary ecosystems and cultural and historical resources; 3) implement resource protection and maritime heritage programs; and 4) implement regulations to limit stressors on marine resources. These beneficial effects would be less than significant because they are relatively small in scope and intensity, and therefore are not likely to result in a substantial, measurable improvement in resource health and protection over the five to 10 year life of the proposed management plan.

In addition to these beneficial effects, some actions proposed under all alternatives would have adverse effects on resources. These adverse effects include: disturbance of the seafloor and benthic habitat from marker buoy deployment and sampling activities and disturbance of wildlife through research and monitoring of species. In all cases, adverse effects were found to be less than significant because NOAA conducts these activities on a small scale and in a manner that implements best practices to substantially minimize the risks of impacts to resources.

NOAA also found that the cumulative effects of the actions proposed under all three alternatives would be less than significant because the effects of MBNMS actions (both beneficial and adverse) are small in scale and localized. Thus, the addition of these minor effects to those of other similar activities occurring in the sanctuary would not significantly alter the cumulative effects of these activities overall.

Table 7. Summary of Effects by Setting and Alternative

	Alternative A No action	Alternative B Adopt revised management plan	Alternative C Adopt revised management plan and regulatory changes
<i>Physical Setting</i>	<p>Several categories of management plan activities would have less than significant beneficial impacts (education and outreach, coordination and collaboration, research and monitoring, and resource protection and stewardship).</p> <p>Six categories of field operations would have less than significant adverse impacts (vessel operations, scuba and snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of remote sensing equipment, and deployment of AUVs/ROVs/gliders/drifters).</p> <p>Four activities would have negligible impacts (routine maritime heritage activities, vessel maintenance, operations of non-motorized craft, and aircraft operations).</p>	<p>Same intensity of impacts from field operations and existing management plan activities as Alternative A (no action). Additional beneficial impacts would be gained from activities and action plans in new priority areas adopted as part of the revised management plan to further inform the management and protection of MBNMS resources.</p>	<p>Same intensity of impacts from field activities as alternatives A and B. Same impacts from new management plan activities as Alternative B.</p> <p>One proposed regulatory change would have less than significant beneficial impacts (implementing motorized personal watercraft zone boundary changes).</p> <p>One proposed regulatory change would have both less than significant beneficial impacts and less than significant adverse impacts (adding a definition and regulatory clarification for “beneficial use of dredged material”).</p>

	Alternative A No action	Alternative B Adopt revised management plan	Alternative C Adopt revised management plan and regulatory changes
<i>Biological Setting</i>	<p>Two categories of management plan activities would have less than significant beneficial impacts (education and outreach, and coordination and collaboration).</p> <p>Two additional categories of management plan activities would have both less than significant beneficial and less than significant adverse impacts (research and monitoring, and resource protection and stewardship).</p> <p>Eight categories of field operations would have less than significant adverse impacts (vessel operations, scuba and snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of remote sensing equipment, operations of non-motorized craft, deployment of AUVs/ROVs/gliders/drifters, and aircraft operations).</p> <p>One field operation activity would have negligible impacts (maintenance of MBNMS vessels).</p>	<p>Same impacts from field operations and existing management plan activities as Alternative A (no action). Additional beneficial impacts would be gained from activities and action plans in new priority areas adopted as part of the revised management plan to further inform the management and protection of MBNMS resources.</p>	<p>Same impacts from field activities as alternatives A and B. Same impacts from new management plan activities as Alternative B.</p> <p>One proposed regulatory change would have less than significant beneficial impacts (implementing motorized personal watercraft zone boundary changes). One proposed regulatory change would have less than significant adverse impacts (adding a definition and regulatory clarification for “beneficial use of dredged material”).</p> <p>One proposed regulatory change would have negligible impacts (allowing access to Zone 5 during High Surf Advisories).</p>

	Alternative A No action	Alternative B Adopt revised management plan	Alternative C Adopt revised management plan and regulatory changes
<i>Human and Socioeconomic Setting</i>	<p>Four categories of management plan activities would have less than significant beneficial impacts (education and outreach, coordination and collaboration, research and monitoring, and maritime heritage program activities).</p> <p>One additional category of management plan activities would have both less than significant beneficial and less than significant adverse impacts (resource protection and stewardship).</p> <p>Nine categories of field operations would have negligible impacts (vessel operations, vessel maintenance, scuba and snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of remote sensing equipment, operations of non-motorized craft, deployment of AUVs/ROVs/gliders/drifters, and aircraft operations).</p>	<p>Same impacts from field operations and existing management plan activities as Alternative A (no action). Additional beneficial impacts would be gained from activities and action plans in new priority areas adopted as part of the revised management plan to further inform the management and protection of MBNMS resources.</p>	<p>Same impacts from field activities as alternatives A and B. Same impacts from new management plan activities as Alternative B.</p> <p>Three proposed regulatory changes would have less than significant beneficial impacts (allowing access to Zone 5 during High Surf Advisories, adding a definition and regulatory clarification for “beneficial use of dredged material,” and implementing motorized personal watercraft zone boundary changes).</p>

	Alternative A No action	Alternative B Adopt revised management plan	Alternative C Adopt revised management plan and regulatory changes
<i>Historical and Cultural Setting</i>	<p>Four categories of management plan activities would have less than significant beneficial impacts (education and outreach, research and monitoring, maritime heritage programs, and resource protection and stewardship).</p> <p>Five categories of field operations would have less than significant adverse impacts (vessel operations, scuba and snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of remote sensing equipment, and deployment of AUVs/ROVs/gliders/drifters).</p> <p>Two categories of field operations would have negligible impacts (onshore fieldwork, and maintenance of MBNMS vessels).</p>	<p>Same impacts from field operations and existing management plan activities as Alternative A (no action). Additional beneficial impacts would be gained from activities and action plans in new priority areas adopted as part of the revised management plan to further inform the management and protection of MBNMS resources.</p>	<p>Same impacts from field activities as alternatives A and B. Same impacts from new management plan activities as Alternative B.</p> <p>One proposed regulatory change would have less than significant beneficial impacts (implementing motorized personal watercraft zone boundary changes).</p> <p>One proposed regulatory change would have less than significant adverse impacts (adding a definition and regulatory clarification for “beneficial use of dredged material”).</p>