Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

Draft Restoration Plan and NEPA Evaluation for the YFD-70 Dry Dock

December 6, 2022

https://farallones.noaa.gov/ and https://montereybay.noaa.gov/

Office of National Marine Sanctuaries
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Cover photo: Starboard side of the YFD-70 Dry Dock. Photo: Marine Surveyors & Safety Consultants, Trip in Tow Suitability Survey, Seattle WA. Dated August 2, 2016.

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Glossary of Acronyms

EFH	Essential Fish Habitat
GFNMS	Greater Farallones National Marine Sanctuary
MBARI	Monterey Bay Aquarium and Research Institute
MBNMS	Monterey Bay National Marine Sanctuary
NEPA	National Environmental Policy Act
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resource Damage Assessment
ONMS	Office of National Marine Sanctuaries
PEIS	Programmatic Environmental Impact Statement
RC	Restoration Center
ROV	Remotely Operated Vehicle

Executive Summary

The National Oceanic and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries (ONMS) follows the Natural Resource Damage Assessment (NRDA) process to assess the impacts of incidents such as oil spills, hazardous waste discharges, object discharge and other vessel incidents affecting sanctuary resources within national marine sanctuaries. As part of the NRDA process, ONMS, as the natural resource trustee, identifies the extent of damages to sanctuary resources, the best methods for restoring them, and the type and amount of restoration required, and presents ONMS's determination to the public in a draft restoration plan for review and comment.

The purpose of this restoration plan is to identify the restoration actions selected by ONMS to compensate for injuries resulting from the deposition of the YFD-70 Dry Dock ("YFD-70") into Monterey Bay National Marine Sanctuary (MBNMS). This plan has been developed in compliance with the National Marine Sanctuaries Act (NMSA; 16 U.S.C. §§ 1431, et seq.) and the National Environmental Policy Act (NEPA; 42 U.S.C. §§ 4321, et seq.).

On October 26, 2016, tug *Ocean Ranger* was towing a dry dock, identified as the YFD-70 from a shipyard in Puget Sound, in Washington state, to a recycling facility in Ensenada, Mexico when the YFD-70 sank within the MBNMS within an area known as Pioneer Canyon. The YFD-70 was located on the seafloor in approximately 3,970 feet water depth (1,210 m). The deposition of the YFD-70 resulted in substantial, persistent, and ongoing impacts to MBNMS seafloor and biota. The presence of the vessel on the seafloor has resulted in the permanent loss of habitat and ecosystem functions within the injury footprint.

In a consent decree for this incident, ONMS settled claims under the NMSA (16 U.S.C. §§ 1431, et seq.) against certain responsible parties arising from the sinking of the YFD-70. Pursuant to the settlement, ONMS recovered approximately $8,700,000 for restoration actions.

Primary restoration actions in this case (e.g., removal of the YFD-70) are not feasible due to the significant technical challenges posed by deep-water salvage, safety concerns, and funding constraints. There is no anticipated recovery time for the habitat and biota crushed within the footprint of the YFD-70 (e.g., the area of seafloor covered by the YFD-70). Therefore, ONMS focused on compensatory restoration projects to be undertaken within the regional ecosystem of the impacted area as the preferred restoration alternative.

ONMS has selected two restoration projects (collectively, the "preferred alternative") that are appropriate, feasible, have a high likelihood of success, and that, collectively, will restore important benthic habitats within the sanctuary that were injured or lost as a result of the deposition of the YFD-70.

Project 1: Target Removal involves removing "targets" selected by ONMS that are impacting the sanctuary seafloor, thereby allowing for subsequent passive restoration of sanctuary seafloor habitat (meaning unassisted recovery and natural succession that occurs in an ecosystem after removal of objects; Meli et al., 2017). Targets include objects/vessels/vehicles of all sizes that can be derelict, abandoned, grounded, or sunken and discarded objects such as shipping containers or crab pots. For Project 1, ONMS anticipates spending approximately $6M over 10

years to remove targets from areas of the seafloor within MBNMS and the adjacent Greater Farallones National Marine Sanctuary (GFNMS), two contiguous national marine sanctuaries that provide similar ecosystem services within the California Current System.

Project 2: Restoring Coral Communities with Outplants involves restoring corals within sanctuary habitat areas. The regional area of focus for the preferred alternative is between Point Arena in Mendocino County and Point Sur in Monterey County, within MBNMS and GFNMS. For Project 2, ONMS anticipates spending approximately $2.5M restoring coral communities through outplanting, a process that takes corals from healthy colonies and transplants them to a new location. ONMS plans to outplant up to 300 corals at 2-5 locations within MBNMS and GFNMS carefully chosen by experts within ONMS. The outplanted corals will immediately serve as habitat and provide regional propagules to grow additional corals within the sanctuaries.

The preferred alternative will restore habitat, biota, and ecological services that have been, and will continue to be, impacted by the deposition of the YFD-70.

Chapter 1: Introduction

Background of Site / Incident

On October 26, 2016, the tug *Ocean Ranger* was towing a dry dock, identified as the YFD-70 Dry Dock ("YFD-70") from a shipyard in Puget Sound, in Washington state, to a recycling facility in Ensenada, Mexico when the YFD-70 sank. The YFD-70 was 528 feet long, 118 feet wide, and 26 feet high (Figure 1). At the time of the sinking, the tug *Ocean Ranger* reported a location of 37° 21.097' N, 123° 06.642' W, approximately 1 nautical mile (nm) east of the outer/western boundary of Monterey Bay National Marine Sanctuary (MBNMS) north of the San Mateo County line, 31 nm SW of Point Montara, San Mateo County, California, which was over Pioneer Canyon, a deep canyon on the continental shelf.

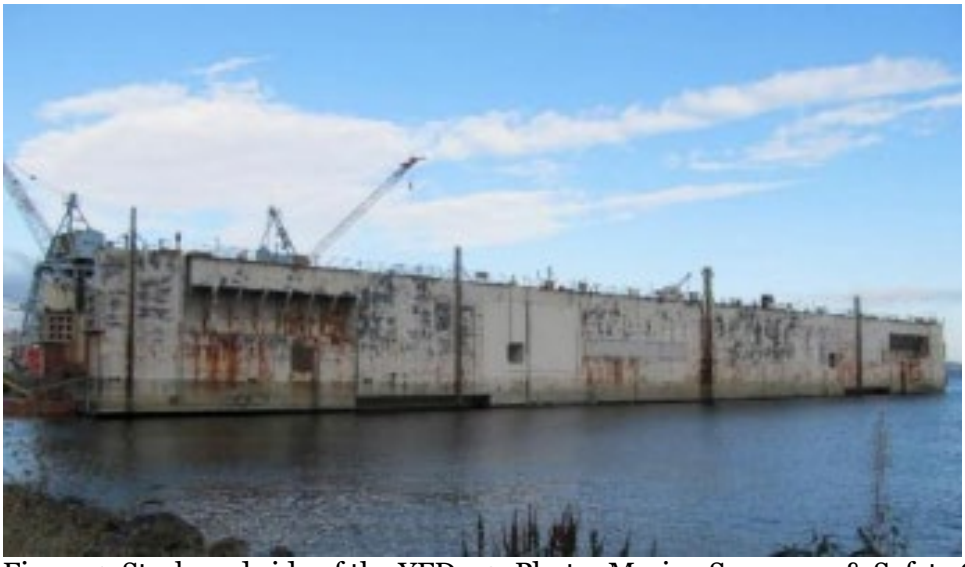

Figure 1. Starboard side of the YFD-70. Photo: Marine Surveyors & Safety Consultants, Trip in Tow Suitability Survey, Seattle WA. Dated August 2, 2016.

Pioneer Canyon has steep-sided gorges on the seafloor of the continental slope, west of San Mateo County, California. Pioneer Canyon is approximately 26 nm long, and at its widest point is 2 nm wide. The eastern half of the canyon, including the head of the canyon, is within MBNMS. The head of Pioneer Canyon is approximately 21 nm west of Half Moon Bay, 13 nm wide, and ranges in depth from 490 feet (82 fathoms) to deeper than 6,500 feet (183 fathoms). In 2016, the high-definition camera on the remotely operated vehicle ("ROV") *Hercules* showed many bamboo coral forests and rocky features with complex and diverse corals, sponges, sea pens, sea whips, other invertebrates, and associated fish throughout its exploration of Pioneer Canyon. This expedition also produced multibeam and backscatter data from the Exploration Vessel (E/V) *Nautilus*, using the Kongsberg EM 302 Multibeam Echosounder. United States Geological Survey performed predicted substrate modeling, using multibeam and backscatter data collected in 2016, which included the western portion of Pioneer Canyon. Subsequent multibeam and backscatter data was collected in 2017, from E/V *Nautilus*, using the Kongsberg EM 302 Multibeam Echosounder. The eastern portion of Pioneer Canyon was included in these surveys, thus completing mapping/data collection for Pioneer Canyon.

Greater Farallones National Marine Sanctuary (GFNMS) has administrative and management responsibilities of the area extending from the San Mateo/Santa Cruz County line northward to the existing boundary between MBNMS and GFNMS, though the existing legal sanctuary boundaries remain the same (NOAA, 2008).

Beginning on July 20, 2018, ONMS conducted surveys using a ROV, over three days, to determine the exact location of the YFD-70 (Figure 2), assess the extent of the impacts to the seafloor and biota such as corals and sponges, and determine the severity and extent of the injury to sanctuary resources. The YFD-70 was located in approximately 3,970 feet of water (1,210 m).

The visual data collected during the 2018 surveys found that there are substantial, persistent, and ongoing impacts to MBNMS seafloor and biota from the deposition of the YFD-70. There is no anticipated recovery time for the habitat and biota crushed within the footprint of the YFD-70 (e.g., the area of seafloor covered by the YFD-70) because removal of the large vessel at that depth would be complex, dangerous, and cost prohibitive. Recovery for the impacted invertebrate species within the larger impacted area (which includes the area where scattered material was cast in the vicinity of the YFD-70) will be long-term, based on the age estimates of multiple species of sea pens estimated to be up to 28 years old (Murillo et al., 2018) and 44 years old (Wilson et al., 2002). The presence of the YFD-70 on the seafloor has resulted in permanent loss of ecosystem functions within the injury footprint.

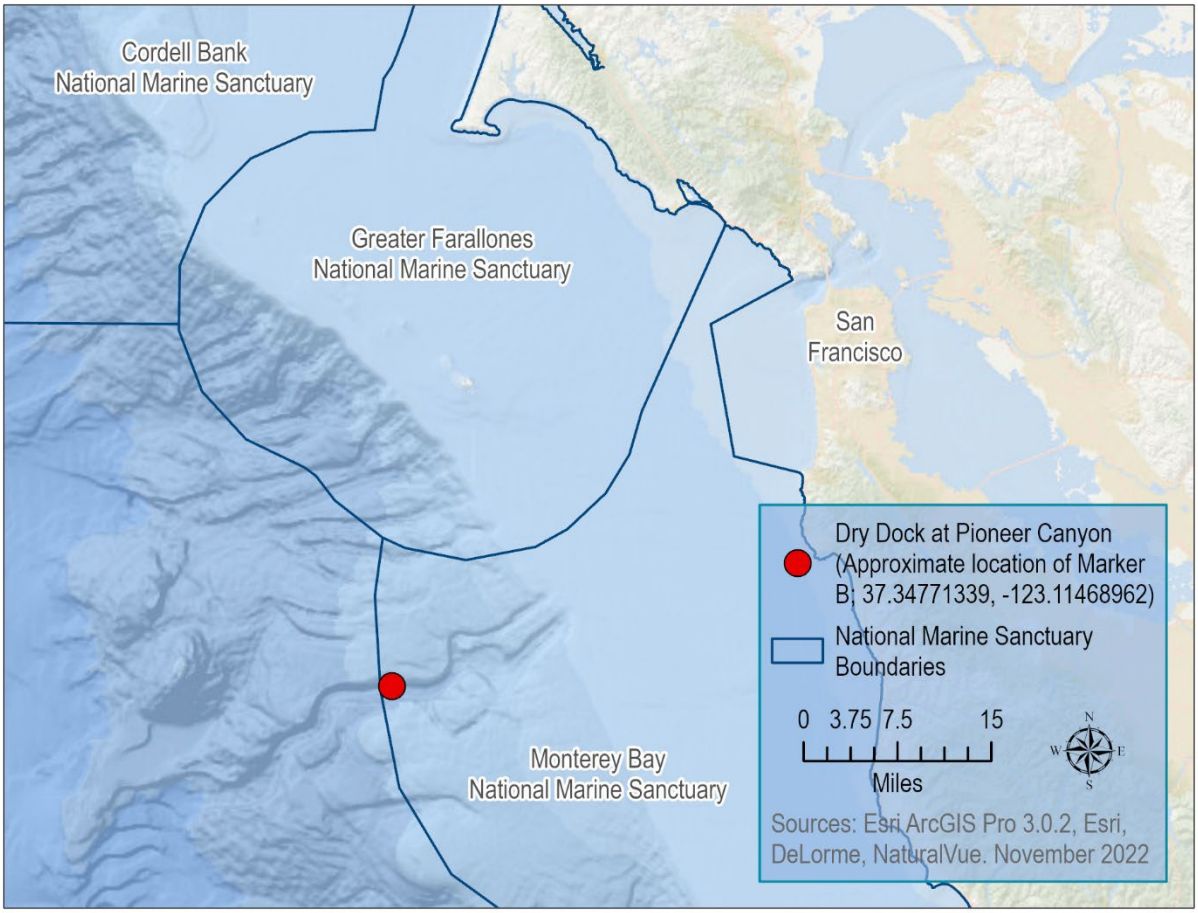

Figure 2. Location of the YFD-70 at Pioneer Canyon. The coordinates for the location were set at "Marker B", placed on the observed southwest corner of the YFD-70 during the surveys in July 2018.

Purpose and Need

ONMS has developed this Draft Restoration Plan and National Environmental Policy Act (NEPA) Evaluation for the YFD-70 Dry Dock (hereafter referred to as Draft Restoration Plan and NEPA Evaluation) that presents the "preferred alternative" for restoring natural resources and ecological services that have been injured, lost, or destroyed as a result of the deposition of the YFD-70 into MBNMS.

Summary of the Settlement Including Funds Available for Restoration

A settlement resolved claims against certain responsible parties under the National Marine Sanctuaries Act (NMSA; 16 U.S.C. §§ 1431, et seq.) for the October 2016 sinking of the YFD-70 inside MBNMS. The consent decree directed defendants to pay damages in the amount of $9,135,134.80.

Authorities and Regulations

National Marine Sanctuaries Act

The NMSA, 16 U.S.C. §§ 1431-1445c, authorizes the Secretary of Commerce to designate and manage areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational, or esthetic qualities as national marine sanctuaries. ONMS has authority to comprehensively manage uses of the National Marine Sanctuary System, and protect its resources through regulations, permitting, enforcement, research, monitoring, education, and outreach.

NMSA section 312 (16 U.S.C. § 1443) establishes liability for destroying, causing the loss of, or injuring sanctuary resources. The NMSA directs ONMS to "restore, replace or acquire the equivalent" of injured resources.

National Environmental Policy Act Compliance

NEPA, 42 U.S.C. § 4321, et seq., and the regulations guiding its implementation at 40 CFR Parts 1500 through 1517, apply to restoration actions that federal natural resource trustees plan to implement under NMSA and other federal laws. NEPA and its implementing regulations outline the responsibilities of federal agencies and provide specific procedures for preparing the environmental documentation necessary to demonstrate compliance. For the proposed restoration actions described in this Draft Restoration Plan for the YFD-70, ONMS is the lead federal agency for compliance with NEPA.

ONMS is integrating the NEPA process in this Draft Restoration Plan and NEPA Evaluation. This integrated process allows ONMS to facilitate public involvement. This integrated process is recommended under 40 CFR § 1500.2(c), which provides that federal agencies should "integrate the requirements of NEPA with other planning and environmental review procedures required by law or by agency practice so that all such procedures run concurrently rather than consecutively." Thus, this document serves, in part, as ONMS's compliance with NEPA.

This document complies with NEPA by: 1) describing the purpose and need for restoration; 2) addressing public participation for this process; 3) identifying alternative actions; 4) summarizing the current environmental setting; and 5) analyzing environmental consequences.

In this case, ONMS proposes to satisfy its NEPA obligations by applying the impacts analysis and conclusions drawn in another, previously published programmatic NEPA document—the NOAA Restoration Center's Programmatic Environmental Impact Statement for habitat restoration activities implemented throughout the coastal United States (RC PEIS). This is discussed further in Chapter 4.

Chapter 2: Injury Assessment

Overview of the Sanctuary

MBNMS is a federally protected marine area offshore California's central coast. Stretching from Marin County to Cambria, MBNMS encompasses a shoreline length of 276 miles and 6,094 square miles of ocean. Supporting one of the world's most diverse marine ecosystems, MBNMS is home to numerous marine mammals, seabirds, fishes, invertebrates, and plants in a remarkably productive coastal environment. MBNMS includes one of our nation's largest expanses of kelp forest, extensive rocky shores, large underwater canyons including Pioneer Canyon, an offshore seamount, and the closest-to-shore deep ocean environment in the continental United States.

Injury Assessment Procedures

Data for the injury assessment was collected though visual surveys conducted over three days in July 2018. Video and photos were collected during the survey and visual observations confirmed location of the YFD-70 within Pioneer Canyon, associated scattered debris on the seafloor, and the presence of corals and bioturbation[1].

Using density calculations (determining the number of organisms in an area) developed according to standard procedures followed by NOAA's National Centers for Coastal Ocean Science of the surrounding area, species accumulation curves (examining the observed species as a function of sampling effort), and heterogeneity analyses (determining the variation in samples) from 35 transects conducted around the wreck in 2018, the following injuries were calculated by the National Centers for Coastal Ocean Science based on a review of the transect data:

- Permanent loss of seafloor habitat and biota from the YFD-70 footprint, which is approximately 69,777.80 square feet (6,482.57 meters squared).
- Long-term and persistent loss of seafloor habitat and biota within the observed scattered debris area from the YFD-70, which is at least 340,765.38 square feet (31,658.14 meters squared).
- A minimum of 1,713-3,672 organisms (fish and invertebrates) were estimated to occur in the footprint of the YFD-70, and were either displaced or crushed and killed by the YFD-70.
- 646-1,305 octocorals were estimated to have been crushed and killed.[2]

[1] Bioturbation, the disturbance of sedimentary deposits by living organisms, is created by large burrowing infauna such as fish, brittle stars, and other invertebrates. Bioturbating activities are known to have a profound effect on the environment and are thought to be a primary driver of biodiversity (Widdicombe et al., 2000). Bioturbators can significantly affect the seafloor habitat building and irrigating their burrows by mixing oxygen into the soft sediment, thus greatly enhancing the exchange of solutes between the sediment and water column (Laverock et al., 2011).

[2] Literature (Wilson et al., 2002; Roark et al., 2005; Murillo et al., 2018) indicates that the types of corals found in the surrounding habitat could be as old as 14-40 years old.

- 539-1,089 fish were either displaced or killed.
- 502-1,209 crustaceans were displaced or killed.

Summary of Impacts

The sinking of the YFD-70 resulted in direct injury to the habitat of Pioneer Canyon and its resident species including corals, sponges, sea pens, and sea whips, which provide structure-forming living seafloor habitat. Specifically, there was damage to the seafloor within the footprint of the YFD-70 and the associated scattered debris area. The habitat and organisms under the YFD-70 are permanently lost and unavailable. The habitat and organisms in the area of scattered debris may have been injured or displaced.

The presence of the YFD-70 and known scattered debris continues to destroy, cause the loss of, and injure sanctuary habitats. The majority of the substrate surrounding the YFD-70 is soft sediment, with numerous holes (e.g., bioturbation), sand waves, cobble lag (e.g., mixed) substrate, and scarps (slumping of soft sediment from hard substrate) with a veneer of sediment covering the hard substrate. Bioturbation holes appear to be produced and used by large burrowing infauna, including fish and invertebrates.

The primary structure-forming living habitat observed in the impact area surrounding the YFD-70 are sea pens, which provide habitat for fish and other organisms to shelter and live. Sea pens are a type of coral that live in soft sediments (Williams, 2011). Even in soft bottom habitats, such as mud or other soft sediment, coral colonies including sea pens, are long-lived and slow-growing with age estimates up to 44 years old (Wilson et al., 2002), which indicates that coral colonies could take decades to recover after injury.

There are many functions that coral and sponge communities provide to the ocean ecosystem (Stone et al., 2005; Taylor et al., 2014; and King et al., 2021). Corals and sponges provide habitat and food for many species of fish and invertebrates throughout the ocean ecosystem at different depths of the continental shelf, slope, deep sea, and in canyons, such as Pioneer Canyon. Corals and sponges provide shelter for larval to adult fish and invertebrates, and areas for breeding and brooding (Stone et al., 2005 and Taylor et al. 2014). Corals also provide habitat for many other animals (Roletto et al., 2017 and King et al., 2021), creating habitat complexity by adding structure for other organisms to shelter in and position themselves higher into the water column for suspension feeding (Stone et al., 2005; Hixon and Tissot 2007; and Taylor et al., 2014). Many invertebrates, including brittle stars, basket stars, crinoids, polychaetes, crustaceans, and gastropods live on coral and sponges. Small crustaceans that live among the corals in this seascape are prey for fish (Rooper et al., 2007). Because many corals are long-lived and record past environmental conditions in their skeletal structures, they provide another service by providing a sort of living record, helping scientists understand how these communities may have been affected by past climate fluctuations and other events (Hill et al., 2011 and Roark et al., 2005).

The health of the substrate on which corals grow is important for the health of coral and the surrounding ecosystem (Hixon and Tissot, 2007). Seafloor disturbance contributes to the loss of possible carbon storage. In recent years, studies have shown that seafloor sediments can store carbon for long periods of time, as long as the sediment is not disturbed. In other words, soft

seafloor sediment serves as a carbon "sink" sequestering carbon and reducing the advancement of climate change (Cartapanis et al., 2016 and Smeaton et al., 2021) in our oceans. Given the deposition of the YFD-70 on the seafloor, it is reasonable to assume that additional storage of carbon in the sediments under the YFD-70 is lost in perpetuity. ONMS cannot estimate the amount of carbon that has been released; however, no additional carbon can be sequestered under the YFD-70.

Chapter 3: Restoration Alternatives Considered and the Preferred Alternative

Evaluation and Selection of Restoration Alternatives

The objective of the restoration planning process is to identify alternatives to restore, rehabilitate, replace, or acquire the equivalent of sanctuary resources and their services that were injured or lost. The restoration planning process may involve two components: primary restoration and compensatory restoration.

Evaluation Criteria

All potential restoration projects were evaluated by ONMS using the following criteria:

- Extent to which alternatives met ONMS' goals and objectives in compensating for the injured sanctuary resources and services;
- The expected costs versus the expected benefits from restoration;
- Technical feasibility of implementing the project;
- The project is not otherwise required to be implemented;
- Compliance with federal, state, and local laws;
- The extent to which the alternatives can be scaled according to the amount of services lost and injuries sustained; and
- Likelihood of project success within the specified timeframe.

Range of Restoration Alternatives

ONMS considered several restoration alternatives to compensate the public for injuries to sanctuary resources, including a "no action" alternative.

The "no action" alternative would be to not conduct restoration to compensate for injuries resulting from the deposition of the YFD-70 into MBNMS. The no action alternative was rejected because it would not result in restoring or compensating for injured resources and services.

Primary restoration actions are actions designed to assist or accelerate the return of resources and services to their pre-injury or baseline levels, generally at the location of the injury. In

contrast, compensatory restoration actions are actions taken to compensate for interim losses of sanctuary resources and services that occur from the date of the incident until recovery.

Due to the difficulty, safety concerns, and funding constraints related to primary restoration actions in this case (e.g., removal of the YFD-70), ONMS only considered compensatory restoration projects for this incident.

The projects in this plan were selected in an effort to compensate directly, to the extent possible, for sanctuary ecosystem services that were lost as a result of the deposition of the YFD-70 into MBNMS. The projects are designed to restore resources similar to those injured by the impact and long-term presence of the YFD-70. ONMS identified and evaluated several compensatory restoration projects and rejected some as not optimal for purposes of providing services similar to those lost as a result of this incident, including bull kelp restoration in Sonoma County. ONMS also rejected some projects because the restoration activities were not scalable to the injuries caused from the sinking of the YFD-70.

ONMS selected two compensatory restoration projects to be implemented as the preferred alternative to compensate for losses of sanctuary resources and services resulting from the deposition of the YFD-70. The preferred compensatory restoration actions will restore seafloor habitat and replace biogenic habitat through: 1) removing objects and vessels impacting the sanctuary seafloor within GFNMS and MBNMS; and 2) planting coral at two to five locations within GFNMS and MBNMS as compensatory habitat for regeneration. These projects are appropriate, feasible, have a high likelihood of success, and collectively, will restore important benthic habitats within the sanctuary that were injured or lost as a result of the deposition of the YFD-70.

“Project 1” involves removing objects and vessels impacting the sanctuary seafloor, thereby allowing for subsequent passive restoration of sanctuary seafloor habitat (meaning unassisted recovery and natural succession that occurs in an ecosystem after removal of objects; Meli et al., 2017). For Project 1, ONMS anticipates spending approximately $6M to remove objects and vessels impacting the sanctuary seafloor and allowing for subsequent passive restoration of sanctuary seafloor habitat. Project 1 would involve the removal of targets that include objects/vessels/vehicles of all sizes that can be derelict, abandoned, grounded, or sunken, and discarded objects such as shipping containers or crab pots within MBNMS and the adjacent GFNMS over a period of 10 years.

“Project 2” involves restoring corals within sanctuary habitat areas. The regional area of focus for the preferred alternative is between Point Arena in Mendocino County and Point Sur in Monterey County, within MBNMS and GFNMS, two contiguous national marine sanctuaries that provide similar ecosystem services within the California Current System. For Project 2, ONMS anticipates spending approximately $2.5M restoring coral communities through outplanting, a process that takes corals from healthy colonies and transplants them to a new location. ONMS plans to outplant up to 300 corals over a period of 10 years at two to five locations within MBNMS and GFNMS that will be carefully chosen by experts within ONMS. The outplanted corals will immediately serve as habitat, colonize and grow over the next 7 years, and provide regional propagules to grow additional corals within the sanctuaries.

Summary of Preferred Restoration Alternative

This restoration plan proposes to use restoration funds for two projects that aim to restore important benthic habitats within GFNMS and MBNMS. Project 1 is the preferred restoration alternative that compensates for injured seafloor habitat and Project 2 is the preferred restoration alternative that compensates for injured biota and will provide important living structure that serves as vertical habitat for associated species. Together, both projects will help restore the habitat, biota, living structure, and ecological services that were injured or lost as a result of the sinking of the YFD-70.

Project 1: Target Removal

Project 1, target removal, will occur at depths from the coastal zone to 150 feet below sea level. Offshore salvage at depths greater than 150 feet is difficult and not feasible for several reasons, including the frequent need to determine precise location of vessel/object at depth, the high cost of locating and removing a vessel/object at depth, the remoteness of offshore waters, and the potential dangers involved with vessel salvage at depth given the size of the machinery needed for this type of operation.

This project compensates for seafloor habitat injured from the YFD-70.

Scope: Remove targets from MBNMS and GFNMS, ranging in locations from southern Mendocino County to Point Sur in Monterey County from the shoreline to seafloor depths no greater than 150 feet. ONMS will remove these targets from multiple habitat types including rocky reefs, sandy beaches, eelgrass beds, and hard, mixed, and soft sediments from the seafloor to achieve a range of ecosystem service benefits that were lost by the deposition of the YFD-70. The project will prevent long-term impacts to the seafloor and allow for subsequent passive restoration of seafloor habitat through the removal of targets that would otherwise continue to harm MBNMS and GFNMS resources.

Timeframe: 10 years of target removal.

Total Cost: Approximately $6M.

Project 2: Restoring Coral Communities with Outplants

Project 2, coral outplanting, a process of taking a live coral colony from one location and planting it at a new location, will occur at depths suitable for successful coral outplanting based on established methodologies (Boch et al., 2020) and within larger areas that have known coral habitats, which is approximately 360-4,400 feet below sea level.

This project compensates for habitat-forming species and biota, in particular corals, injured from the YFD-70.

Scope: Outplant up to 300 corals in two to five previously-disturbed habitat locations within MBNMS and GFNMS that are currently protected from known human

impacts in order to immediately serve as habitat and to provide regional propagules to grow additional corals.

Timeframe: 10 years for outplanting and regeneration. Outplant up to 300 corals on the seafloor during the first three years of the project, which will support the subsequent passive regeneration, and hence restoration, of the coral colonies over the final seven years of the project.

Total Cost: Approximately $2.55M.

Nexus to Injuries

These two restoration actions are intended to compensate for injuries resulting from the deposition of the YFD-70. Project 1 compensates for injured seafloor habitat within the impacted ecosystem. Project 2 compensates for biota and structure-forming living habitat associated with the ecosystem that was permanently lost from the deposition of the YFD-70.

The calculated area impacted by the footprint of the YFD-70 is 69,777.80 square feet (6,482.57 meters squared) of seafloor habitat and a minimum of 1,713-3,672 organisms, including an estimated 646-1,305 octocorals, that were either displaced or crushed and killed by the YFD-70.

ONMS has taken a "seascape approach" consistent with the NOAA Mitigation Policy for Trust Resources[3] to develop compensatory restoration actions to address the injuries to sanctuary resources resulting from the deposition of the YFD-70. In selecting the preferred restoration actions, ONMS evaluated: the range of the affected living marine resources, the size of the injured area, connectivity between the injured area and other areas, the geographic scope of the ecosystem functions and services that were lost, and cumulative effects. The selected restoration actions will be implemented at ecologically- and economically-relevant scales to the injuries in order to help restore ecosystem functions and services. ONMS has designed Project 1 and Project 2 to support the sustainability and improvement of trust resources within MBNMS and GFNMS. The restoration project areas will contribute to or improve the overall ecological functioning of aquatic resources in the seascape. This approach to selecting restoration actions is founded in the best scientific information available, and acknowledges the connections between inland, estuarine, and marine resources.

For the purpose of ensuring a seascape approach, the geographic range of the selected projects include habitats of GFNMS and MBNMS from Point Sur in Monterey County to Point Arena in Mendocino County. This range is part of the California Current Ecosystem which shapes the oceanographic setting in GFNMS and MBNMS through the upwelling process that brings cold, nutrient rich waters up from the deep ocean and drives the productivity of the ecosystems (ONMS, 2021 and ONMS, 2014). Both MBNMS and GFNMS experience strong upwelling influence from Point Arena to Point Sur and similar seasonality in upwelling patterns. The seasonal episodes of productivity support populations of krill, squid, sardines, and other species that are fed upon by larger fishes, seabirds, and marine mammals. Thus, the areas

[3] NOAA Mitigation Policy for Trust Resources: https://www.fisheries.noaa.gov/feature-story/noaa-releases-first-comprehensive-policy-mitigation-conserve-natural-resources

between Point Arena and Point Sur are important for providing the ecosystem functions and services offered by coastal upwelling (MBNMS, 2021; GFNMS, 2015; and Garcia-Reyes and Largier, 2012). GFNMS and MBNMS also share common habitat types, depths, and many species that are relevant to the objectives for the resources under consideration (ONMS, 2021 and ONMS, 2014).

The habitats in both Project 1 and Project 2 support species that occur in both GFNMS and MBNMS between Point Sur and Point Arena, including over 60 species of groundfish (flatfish and rockfish); over 100 estimated species of corals, including: sea pens and sea whips, and sponges; and 36 species of marine mammals during all life stages. For example, groundfish including rockfish and flatfish use estuarine and nearshore habitats during their juvenile stage and then move to the nearshore and offshore as adults. Rockfish can be found in all waters and bottom areas at depths less than 11,000 feet (3,500 meters) below sea level (Pacific Fishery Management Council, 2012). Fish, including rockfish, are also associated with structure-forming living habitat, which they use to hide from predators (Heifetz, 2002; Kreiger et al., 2002; and Stone, 2005). Other species that can benefit from the two restoration actions include harbor seals and sea lions who use mudflats in estuaries and coastal beaches to rest, breed, and raise their pups. These species forage throughout the waters of GFNMS and MBNMS on many of the fish species that are associated with structure-forming living habitat.

Project 1: Target Removal

Goals and Objectives of the Project

The long-term goal of this project is to restore as much seafloor habitat area as possible to compensate for the area of habitat that was permanently lost from the YFD-70 footprint. ONMS plans to remove targets over a 10-year period.

Habitat Injury and Restoration Need

ONMS has determined the removal of the YFD-70 from the sanctuary would present technical challenges due the YFD-70's location in nearly 4,000 feet water depth, exceed available funding, and raise safety concerns, making removal of the vessel too difficult and cost prohibitive. This means that primary restoration of the impacted site is not feasible. However, compensatory restoration of injured sanctuary habitat can be accomplished by removal of other targets within the boundaries of MBNMS and GFNMS at multiple locations, generally at the shoreline, nearshore, and in waters up to 150 feet deep.

Incidents within the sanctuary have caused a variety of permanent and/or chronic impacts to habitat types and wildlife over the years (see below under Section 3 "Current Habitat Injuries" for more specific information). The types of injury that occur vary depending on some or all of the following factors:

- the location of the incident;
- the size and type of material discharged (e.g., vessel, shipping container, vehicle, or other large object);

- whether fuel, other hazmat, fishing gear, or other harmful matter is onboard and discharged;
- the time of year when an incident occurred (and what wildlife may be present at that time); and
- other seasonal and oceanographic factors.

These incidents are chronic and ongoing and occur every year within MBNMS and GFNMS. Combined, these two sanctuaries have some of the highest numbers of incidents of any national marine sanctuary on the West Coast, averaging around 15 incidents per year.

In addition, ONMS and other agency partners often lack the funds to remove these objects. In some cases, only a partial salvage is completed due to delays in salvage contracting or because complex incidents in remote locations prevent full removal.

The purpose for this project is to restore resources similar to those injured by the impact and long-term presence of the YFD-70 by removing targets elsewhere in MBNMS and the adjacent GFNMS that would otherwise persist and injure sanctuary habitat and biota.

Current Habitat Injuries

These incidents cause a range of adverse impacts to resources in the sanctuary including:

- Crushing of corals, sponges, and other benthic fauna in offshore environments.
- Smothering of benthic invertebrates in both offshore and nearshore environments.
- Water quality impacts from the discharge of petroleum products, other chemicals and hazardous materials, plastic, and other harmful matter, which can affect marine life through direct exposure and through bioaccumulation in the food chain.
- Permanent loss and/or scarring and damage to rocky reef habitat; damage to rock reef and pinnacles is permanent and reduces the value of substrate to support coral/sponge colonies, algal assemblages, and other encrusting and habitat-forming organisms.
- Entanglement threats to marine mammals, seabirds, and sea turtles from the discharge of fishing nets, traps, pots, or other lines.
- Loss of carbon storage (e.g., sequestered carbon in the seafloor) through the disturbance of sediments.
- Ingestion hazards for wildlife foraging above the mean high tide line, on the ocean surface, or in submerged lands from floating or sunken plastic and other small debris; plastic particles may be ingested by marine organisms that select food by sight, filter feeders, or animals that live in the open water who mistake plastic for food.
- Contamination of food sources, such as plankton and lower trophic species, in the water column (from petroleum and other hazardous materials).

Potential impacts by habitat type are captured in more detail in the table below (Table 1). More information on specific species and habitat types that are susceptible to injury can be found in the analysis conducted for GFNMS and MBNMS management plans (ONMS, 2021 and ONMS, 2014).

Table 1. Potential Habitat Injuries from the Deposition of Debris Over the GFNMS and MBNMS Seascape.

Habitat Type		**Potential Direct Impacts to the Physical Environment**	**Potential Indirect Impacts to the Physical Environment**	**Potential Direct Impacts to the Biological Environment**	**Potential Indirect Impacts to the Biological Environment**
Submerged lands (up to 150 feet below sea level)	Mud	Carbon loss from large debris contact; contaminant loading in sediments; loss of habitat for burrowing organisms	Loss of benthic foraging area	Smothering of benthic organisms (such as worms and clams); exposure to contaminants	Temporary increases in suspended sediment that can smother and bury plants and animals or clog the filter-feeding apparatus of animals like mussels.
	Sand	Contaminants loading in sediments; loss of habitat for flat fish, soft sediment, and interstitial organisms	Loss of benthic foraging area	Smothering of benthic organisms; exposure to contaminants	
	Rock	Permanent loss of rock; scarring, gouging, or scraping of rock; loss of habitat for reef organisms	Lost bare rock area for future use by flora and fauna (e.g. corals)	Smashing of encrusting organisms; removal of habitat-forming algal assemblages (such as coralline algae)	
Coastal Nearshore	Intertidal rocky reef	Permanent loss of rock; scarring, gouging, or	Lost bare rock area for future use by flora and fauna	Smashing of encrusting organisms (such as sea stars,	Loss of feeding opportunities for organisms

		scraping of rock; loss of habitat for reef organisms	(e.g. kelp)	mussels); removal of algal assemblages; loss of marine flora (such as seagrass and kelp)	that feed on marine flora
	Intertidal sandy beach	Contaminants loading in sediments; accumulation of marine debris; loss of habitat for sandy beach and interstitial organisms	Marine debris accumulation in beach wrack	Entanglement of marine mammals and shore birds	Ingestion of plastics/ debris by foraging wildlife as debris breaks down in size
Estuarine	Mudflats	Contaminants loading in sediments; loss of habitat for burrowing organisms	Loss of foraging area	Smothering of organisms; loss of breeding and nursery habitat for organisms (such as herring) which attach their eggs to eelgrass	
	Marsh	Permanent loss of rock, scarring/scrap ing of rock	Loss of bare rock area for future use by organisms/ seagrasses	Smashing of encrusting organisms; loss of breeding and nursery habitat for organisms	Smashing of encrusting organisms

Restoration Project Components

ONMS proposes to remove a number of predefined targets from MBNMS and GFNMS, ranging in locations from southern Mendocino County to Point Sur in Monterey County in order to meet the goal of compensatory restoration of similar seascapes. Targets will be removed from the shoreline to seafloor depths no greater than 150 feet. ONMS will remove these targets from multiple habitat types including rocky reefs, sandy beaches, eelgrass beds, and hard, mixed, and soft sediments from the seafloor to achieve a range of service benefits. The targets will be determined annually and outlined in an annual target report.

For individual target removal projects, ONMS would be responsible for determining and documenting the necessary environmental compliance, such as any applicable reviews, permits, or consultations under NEPA. This environmental compliance would occur for all identified targets and would be documented within the annual target report.

Possible Benefits of the Restoration Project

Leaving targets in place over the next 10 years will result in a significant amount of marine debris, pollution releases into the sanctuary, and both permanent and temporary injuries to a variety of habitat types. Heavier and larger targets have the potential to cause ongoing damage for years as they break up and get washed by waves or pushed by currents throughout an area. In addition, the release of marine debris from onboard these targets (e.g., lines, plastic, and insulation) may pose ingestion or entanglement hazards to wildlife over large areas.

This project would remove targets from MBNMS and GFNMS, restoring habitat and removing pollution and ancillary debris from onboard targets, thereby limiting the scope and timeframe of injuries.

Products and Outcomes/Metrics

ONMS will produce an annual target report which will identify the targets selected for removal each calendar year, the salvage methods, the identified impacts from each operation, and the costs.

Estimated Cost of Restoration

The total cost to remove targets over a 10-year period between the area of Point Sur and Point Arena at depths ranging from the shoreline to 150 feet below sea level is approximately $6M.

To determine the expected removal costs, scope, and duration for this restoration project, ONMS compiled salvage operations costs for large debris incidents within the GFNMS management area (including grounded vessels, sunken vessels, sunken aircraft, and other large debris occurring between 2012 and 2021). ONMS included salvage operations costs (e.g., money spent by ONMS or other partner agencies to remove a target) and salvage bid estimates (estimated costs for incidents where no removal occurred) to estimate the costs of this restoration project.

Project 2: Restoring Coral Communities with Outplants

Goals and Objectives of the Project

The goal of the proposed coral outplanting project is to create healthy coral communities in two to five locations in areas of MBNMS and GFNMS where they are depauperate (lacking in numbers or variety of species). Through this restoration project, previously-disturbed habitat will be restored by outplanting corals to immediately serve as habitat, and to provide regional propagules that will grow additional corals.

Habitat Injury and Restoration Need

The sinking of the YFD-70 resulted in direct injury to the habitat of Pioneer Canyon and its resident species and structure-forming living seafloor habitat including corals, sponges, sea pens, and sea whips. Specifically, there was damage to the seafloor within the footprint of the YFD-70 and the associated scattered debris area. The habitat and organisms under the YFD-70 are permanently lost and unavailable. The habitat and organisms in the area of scattered debris may have been injured or displaced.

The presence of the YFD-70 and known scattered debris continues to destroy, cause the loss of, and injure sanctuary habitats. Utilizing data collected from the July 2018 ROV surveys, it is estimated that a minimum of 1,713–3,672 organisms (fish and invertebrates) were estimated to occur within the footprint of the YFD-70, and were either displaced or crushed and killed by the YFD-70 (Roletto and Tezak, 2021). Of these, 646–1,305 octocorals were estimated to have been crushed and killed, 539–1,089 fish were either displaced or killed, and 502–1,209 crustaceans were displaced or killed.

The types of corals found in the surrounding habitat could be as old as 44 years old (Wilson et al., 2002 and Murillo et al., 2018). Corals are considered structure-forming living habitat and can take tens to hundreds of years to fully recover, even if young propagules are available to naturally recruit into the disturbed area. A diverse assemblage of invertebrates and fishes lives on and around corals (Baillon et al., 2012; Rooper et al., 2019; and Tissot et al., 2006).

The restoration of corals will replace lost slow-growing species with similar fauna, thus providing structure-forming living habitat for a range of species that exist in both GFNMS and MBNMS. Recently, successful methods for restoring corals were developed regionally by scientists at the Monterey Bay Aquarium Research Institute (MBARI) and MBNMS (Boch et al., 2019 and 2020). These methods will be applied and refined for this coral outplanting project.

Restoration Project Components

ONMS staff and partners who plan and implement coral restoration projects within GFNMS and MBNMS will work together to restore the coral communities. Coral collection, processing, and transplantation methods will follow established and proven techniques (Boch et al., 2019 and 2020), with some improvements for the use of eco-friendly materials (e.g., cardboard and rocks) in place of plastic.

The project will consist of these components:

- Pre-outplanting site selection, coral collection, and processing for outplanting;
- Coral outplanting; and
- Restoration effectiveness monitoring.

The objective is to plant up to 300 corals on the seafloor during the first three years of the project, which will support the subsequent passive regeneration and restoration of the coral colonies over the final 7 years of the project. Recruitment rates of these corals are not documented in scientific literature. However, conservative estimates of potential recruitment rates, in addition to known survivorship rates from outplanted corals (Boch et al., 2019),

indicate the project should result in an increase in the total number of corals restored through passive restoration over time if human-caused disturbances to the restoration areas, such as benthic fishing, do not occur. The following criteria will be used to select the final appropriate locations and subsequent restoration sites:

Areas that were previously disturbed by benthic fishing trawls and groundfish bottom contact gear, but are currently closed to these gear types through a NOAA National Marine Fisheries Service action that designated essential fish habitat (EFH) Conservation Areas and the Non-Trawl Rockfish Conservation Area for the groundfish fishery. Combined, these actions prohibit fishing for the trawl and non-trawl groundfish fishery, which includes the limited entry fixed-gear and open access non-trawl gear fisheries, all of which can impact the seafloor.

Depths that are suitable for outplanting will be identified based on established methodologies (Boch et al., 2020) and within larger areas that have known coral habitats. Corals suitable for outplanting occur at depths between approximately 360-4,400 feet (~60-735 fathoms) below sea level.

For coral outplanting, ONMS staff and partners will target areas of hard substrate where corals are known to historically or currently occur, and in locations that are protected from drilling, dredging, trawling, or seafloor disruption by sanctuary and other regulations such as those promulgated by NMFS. Five potential locations have been identified and will be further evaluated for suitability. See Figure 3 for details.

First, if relevant location imagery is not already available, the precise areas within an identified restoration site will be surveyed using an ROV to verify the suitability of restoration. Environmental conditions will be measured using a conductivity, temperature, and depth ("CTD") sensor on the ROV. Video and still imagery will be captured to verify the substrate type. Also, substrate samples will be collected. Multiple sites within a location may need to be surveyed to find an area of stable hard substrate, and at least two sites will be selected to maximize success and restoration impact.

Next, the ROV will be used to collect small branches of corals from healthy colonies where they are known to be abundant (e.g., Sur Ridge) and transport them to the surface in temperature-controlled storage containers (bioboxes). Without exposing them to air, the corals will be prepared for transplant in a shipboard temperature-controlled cold room and placed in coral pots. Coral pots will be constructed of cardboard and weighted with cement. Previously collected, pre-drilled rock will also be used as transplant pots. Corals will be inserted and fixed to the pots (or rocks) with cement. Each pot or rock will have an approximate 4-inch diameter footprint and weigh approximately 2 pounds (dry weight). After coral pot/rock assembly, the corals will be relocated to the restoration area (Figure 4; Note: Figure 4 shows use of PVC pipe, which was used to first prove the transplant technique; this project will replace PVC pipe with cardboard tubing or rocks).

Coral pots will be placed directly on the seafloor. Transplant sites will be selected within depauperate areas of relatively flat terrain for maximum coral pot stabilization. During pre-trials for this method of placing untethered cement-weighted pots directly on the seafloor it was proven effective, with negligible movement between repeated visits. Coral collections will follow

best practices and special conditions outlined in federal permits issued for the planting activities. For example, coral branches will be collected from colonies in areas where multiple individual colonies are present (rather than isolated specimens). These guidelines will be followed to minimize mortality and striping clear of any area of existing dense coral colonies.

During year eight, the project sites where corals were transplanted will be surveyed by ROV to determine the survivorship, health, reproductive status, and growth of the outplanted corals. Video and still images will be captured to enable detailed measurements. Surveys for fish and invertebrates in the immediate area will be made to determine community development. In addition, the surrounding area will be surveyed to determine the conditions of naturally-occurring corals. Environmental conditions will be measured using a CTD on the ROV. A report will be developed that assesses the effectiveness of the project and will identify if there is a need for corrective actions in years nine and ten.

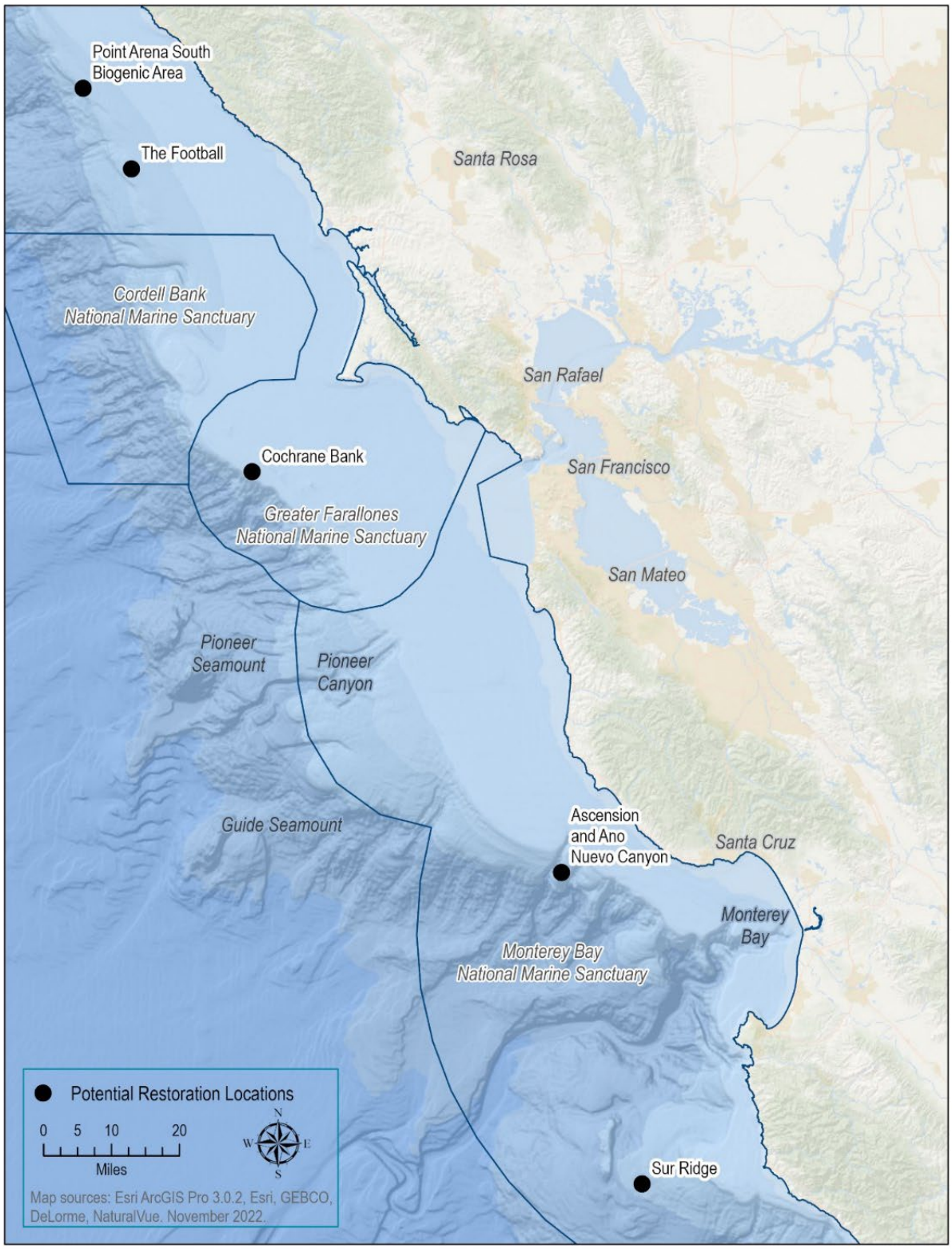

Figure 3. Map of potential coral restoration locations based on selection criteria.

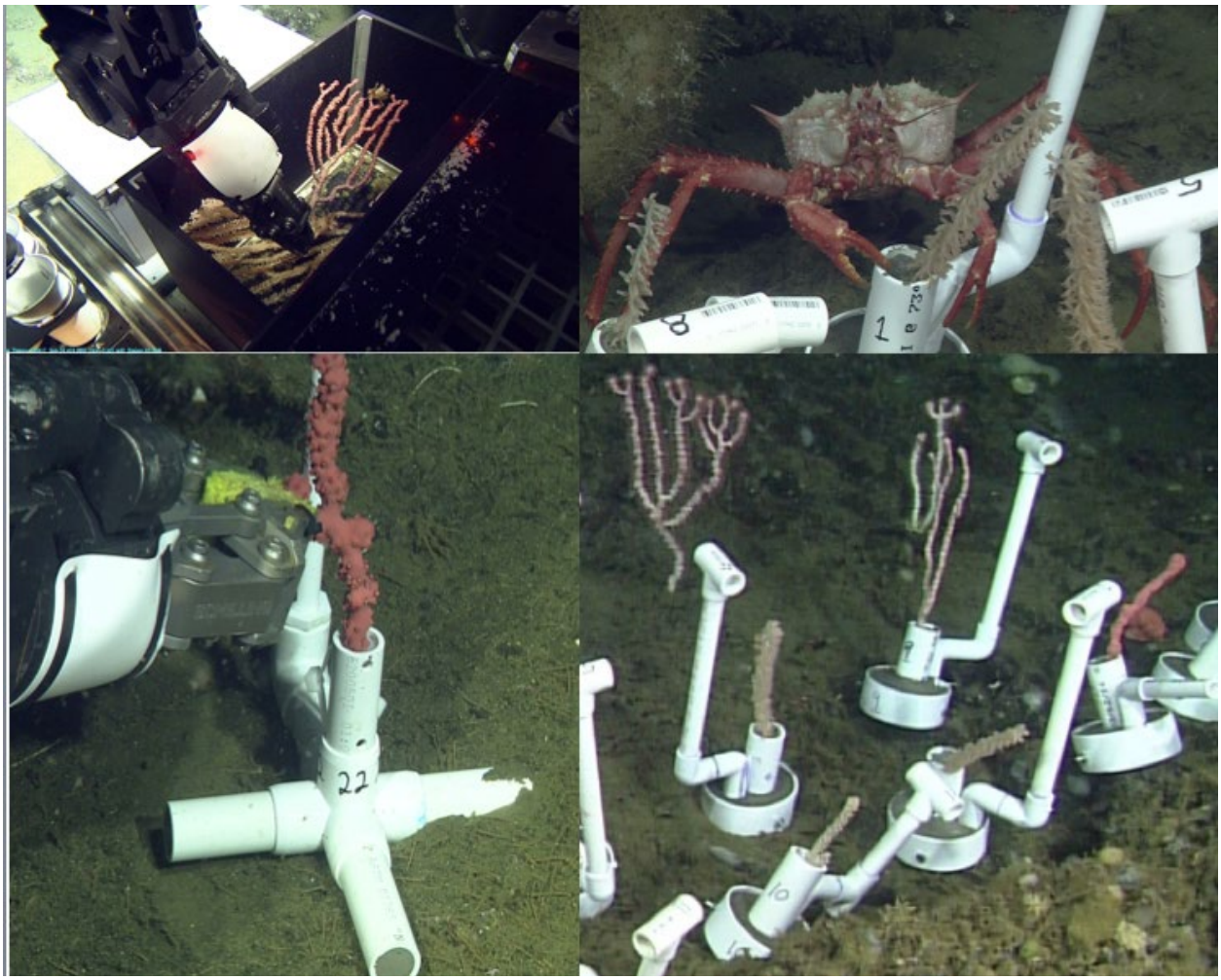

Figure 4. Successfully transplanted *Paragoria* sp. and *Isidella* sp. corals on Sur Ridge. Photo credit: MBNMS/MBARI. Note: Plastic is no longer used for transplanting.

Possible Benefits of the Restoration Project

The transplantation of corals to previously depauperate areas is likely to enhance the seafloor with structure-forming coral habitat. In addition to the immediate presence of coral, they will be releasing propagules beyond the restoration site. Species that form biogenic structures tend to promote both biodiversity and ecosystem function. Efforts to translocate healthy or rehabilitated corals may accelerate the recovery of local diversity and ecosystem function in coral and sponge communities that have been disturbed or destroyed by human activity (Boch et al., 2019).

Coral restoration within protected seafloor areas would benefit not only long-lived corals, but the many species that use the coral structure for living space, associated food sources, or nursery areas, including: fishes (e.g., thornyhead rockfishes, Dover sole, deep-sea sole, sablefish, grenadiers, snailfishes, eelpouts, sculpin, cuskeel, codling, hagfish, catshark, skates); crabs; shrimps; squat lobsters; molluscs (e.g., nudibranchs, octopus); sea stars; basket stars; brittle stars; crinoids; anemones; amphipods; and polychaetes. These species feed and live among the

small and large corals at sites within GFNMS and MBNMS (e.g., Burton et al., 2017; Etnoyer et al., 2014; Graiff et al., 2016; Graiff et al., 2021). Corals and other species that live in this seascape are important for ecosystem health, function, and local diversity. This project is unlikely to adversely affect EFH, but rather improve or enhance EFH; an expected long-term beneficial impact to the seafloor and surrounding habitat.

Products and Outcomes/Metrics and Monitoring

ONMS will develop an annual report for all years when coral collection and outplanting occurs, describing the activities of the year including transplanting and monitoring results. There will be an expedition in year eight to determine the effectiveness of the transplanting.

Monitoring will determine the survivorship, health, growth, and reproductive status of the transplanted corals. Monitoring of this restoration project is a component of compensatory restoration. Monitoring serves several important purposes. Monitoring is the primary means for determining whether this project provides services in a manner consistent with restoration goals. Monitoring also allows sanctuary scientists to assess the progress of restoration and to identify, as necessary, timely corrective action to shorten the injury recovery period.

An evaluation for effectiveness will be conducted after the monitoring expedition, and if additional restoration interventions are needed (e.g., outplanting in an area with greater success, using different species, or adjusting methodologies), then the final report will document those needs and contingency funds will be used to provide additional restoration interventions.

Estimated Cost of Restoration

In order to restore corals to help compensate for injuries resulting from the sinking of the YFD-70, ONMS plans to plant up to 300 corals during the first 3 years of the project. Monitoring, which will occur during year eight of the project, will evaluate effectiveness of the coral planting efforts. Monitoring is an important component of this compensatory restoration project, because it is intended to allow ONMS to see whether the project is creating the restoration benefit needed and to take corrective action if needed to ensure restoration is accomplished and to document the effectiveness of the project. The planned number of corals were determined by estimating costs for 2025; this was calculated by using 2022 cost estimates and increasing the cost by 3% annually to consider inflation. See Table 2 for details. The total estimated cost for this project is approximately $2.55M.

Potential research vessels in the region with offshore capabilities include MBARI's research vessels *David Packard* (with ROV *Doc Ricketts*) and *Rachel Carson* (with ROV *Ventana*); and sanctuary research vessel *Fulmar* (potentially used for monitoring). Depending on availability, one of these vessels will be used for the project and costs may vary depending on which vessel is used. Therefore, estimated vessel costs are based on an average cost of the combined vessels.

Table 2: Estimated Costs for Coral Outplanting

Year	Coral Restoration Activities and Supplies[4]	Description	Contract and Administrative Services[5]	Total
2025	$550,000	8 days over 2 sites: 1 day for pre-surveys and site selection and 3 days to collect and outplant	$225,000	$775,000
2026	$550,000	8 days: 4 days per site to collect and outplant	$200,000	$750,000
2027	$225,000	3 days: 3 days at one site to collect and outplant	$200,000	$425,000
2032-2033	$350,000	4 days: effectiveness monitoring, final project analysis and final report	$250,000	$575,000
TOTAL	**$1,675,000**		**$875,000**	**$2,550,000**

Chapter 4: NEPA Evaluation

NOAA's Policy and Procedures for Compliance with NEPA and Related Authorities (NOAA Administrative Order (NAO) 216-6A and Companion Manual) establishes NOAA's policy and procedures for compliance with NEPA and the associated regulations promulgated by the Council on Environmental Quality.

Under NEPA, federal agencies must evaluate potential impacts to the environment from their proposed actions and reasonable alternatives. If impacts are potentially significant, an environmental impact statement is required, but if impacts are either unclear or considered not significant, an environmental assessment may be prepared. Additionally, some types of actions may qualify for a categorical exclusion, or otherwise not be subject to NEPA. NEPA also allows for broad programmatic analyses that subsequently can be used to meet NEPA requirements for project-level actions through incorporation by reference and tiering. This process is discussed further below. The NEPA process ensures that the public and decision-makers are fully informed about the potential impacts of the proposed action and its alternatives and allows for meaningful public involvement in the decision-making process.

[4] Coral restoration activities and supplies include ROV and vessel operations, storage tanks, tools, cement, sensors, and electronic storage.

[5] Contract and administrative services include coordination and execution of field activities, data collection, analysis, environmental compliance, and cost documentation and reporting.

Use of the NOAA Restoration Center PEIS

After decades of experience evaluating and implementing environmental restoration projects, NOAA's NMFS Office of Habitat Conservation's Restoration Center (RC) has determined that many of its efforts involve similar types of activities with similar environmental impacts. To increase efficiency in conducting future NEPA analyses for a large suite of habitat restoration actions, the RC developed the Programmatic Environmental Impact Statement (RC PEIS) for habitat restoration activities implemented throughout the coastal United States in 2015. After a public comment period, a Record of Decision was signed July 20, 2015. The RC PEIS is available online.

The RC PEIS provides a program-level environmental analysis of RC habitat restoration activities throughout the coastal and marine United States. Specifically, it evaluates typical impacts related to a large suite of projects undertaken frequently by the RC, including, but not limited to: coral reef restoration; debris removal; beach and dune restoration; signage and access management; fish passage; fish, wildlife, and vegetation management; levee and culvert removal, modification, and set-back; shellfish reef restoration; subtidal planting; wetland restoration; freshwater stream restoration; and conservation transactions. These analyses may be incorporated by reference in subsequent NEPA documents, including tiered NEPA documents, where they are applicable.

For example, a site-specific NEPA document may evaluate a restoration project where all potential impacts were addressed in the RC PEIS. In that instance, the site-specific NEPA document would, in effect, incorporate by reference the full impacts analysis from the RC PEIS. In those cases where the RC PEIS determined none of the potential impacts would be significant, the site-specific NEPA document could incorporate that conclusion by reference as well. In short, no further NEPA analysis would be necessary so long as the proposed action and alternatives are within the range of alternatives and scope of potential environmental consequences analyzed in the RC PEIS and do not have any significant adverse impacts. Conversely, if the site-specific restoration activity is not within the scope of alternatives or environmental consequences considered in the RC PEIS, it would require additional NEPA analysis through preparation of a new NEPA document.

Project 1: Target Removal

ONMS determined that Project 1 is within the scope of the proposed action, range of alternatives, and environmental effects described in the RC PEIS.

General Description of the Affected Environment for Project 1

Potential targets can be located in a variety of physical environments and can affect a variety of biological resources and human uses. This Draft Restoration Plan and NEPA Evaluation incorporates by reference the affected environment description of coastal habitats, geology and soils, water resources, living coastal and marine resources and EFH, threatened and endangered species, cultural and historic resources, land use and recreation, and socioeconomics within the RC PEIS.

ONMS has made the determination that the RC PEIS contains an applicable and adequate description of the affected environment generally associated with the debris removal activities described in this Draft Restoration Plan and NEPA Evaluation.

Impacts Analyzed for Project 1

The RC PEIS impacts analysis includes a description of the impacts associated with the types of restoration activities discussed in this Draft Restoration Plan and NEPA Evaluation. That information can be found in Chapter 4 and Table 11 of the RC PEIS, and more specifically, in Section 4.5.2.2 and Table 17 of the RC PEIS (Debris Removal). In general, the environmental impacts from the types of debris removal activities proposed for Project 1 have already been analyzed in the RC PEIS. Direct, indirect, and cumulative impacts to relevant resources (geology and soils, water resources, air quality, living coastal and marine resources and EFH, threatened and endangered species, cultural and historic resources, land use and recreation, and socioeconomics) under the preferred alternative are also fully summarized in the NEPA Inclusion Analysis in Appendix A of this Draft Restoration Plan and NEPA Evaluation.

Project 1 would result in beneficial impacts on geology, soils, and land use and recreation, simply because those areas would be free of the unwanted debris. Water quality can improve when debris is removed and the debris or associated leachate is no longer present in the coastal environment. Implementation of debris removal projects would also result in beneficial impacts on living coastal and marine resources, EFH, and threatened and endangered species, because habitats would be cleared of potentially injurious debris. These beneficial impacts would likely extend beyond the project site. For a more detailed discussion of the affected environment in and around debris removal activities, refer to Chapter 3 of the RC PEIS.

ONMS has determined that the preferred alternative would not result in adverse impacts beyond the scope of those analyzed in the RC PEIS, or meet any other criteria for exclusion from analysis (refer to Table 10 in the RC PEIS). Ultimately, the RC PEIS concludes that the anticipated impacts would not be significant; ONMS proposes to adopt that conclusion and the analysis in this case. A more detailed description of ONMS' justification for doing so can be found in the NEPA inclusion analysis (Appendix A).

Project 1 activities have not yet occurred and the scope, scale, and impacts from target removal activities could vary based on a number of factors, including but not limited to:

- the location of the incident;
- the size and type of material (i.e. vessel, shipping container, vehicle, or other large object);
- whether fuel, other hazmat, fishing gear, or other harmful matter is onboard and discharged;
- the time of year when an incident occurred (and what wildlife may be present at that time); and
- other seasonal and oceanographic factors.

For these reasons, adoption of Project 1 in this restoration plan does not authorize or approve implementation of any individual project. The restoration plan has, however, described the potential impacts and benefits that may result from target removal projects. This information is

presented for the benefit of informing the public of the possible impacts and outcomes for target removal projects in general.

For each target considered for salvage under this project, ONMS would conduct a net environmental benefits analysis to ensure that the positive effects from restoration would outweigh any impacts from the salvage operations. Additionally, salvage activities would follow best practices to minimize impacts.

Conclusions for Project 1

Through the analysis in this Draft Restoration Plan and NEPA Evaluation, ONMS has determined that the corresponding Project 1 description and impacts fall entirely within the scope of the project descriptions and analysis contained in the RC PEIS sections referenced above. Moreover, there are no geographic, project- or site-specific considerations, sensitivities, unique habitat, or resources that warrant additional NEPA analyses beyond what is provided in the RC PEIS. The public is invited to provide feedback on ONMS' proposed action, the alternatives and the analysis conducted in the Draft Restoration Plan and NEPA Evaluation, which includes a draft NEPA inclusion analysis.

ONMS would generate an inclusion memorandum, which would memorialize ONMS' decision to rely on the RC PEIS and adopt the final NEPA inclusion analysis. The inclusion memorandum would be finalized and signed prior to approval and public release of the Final Restoration Plan and NEPA Evaluation.

Project 2: Restoring Coral Communities with Outplants

ONMS determined that Project 2 is within the scope of the proposed action, range of alternatives, and environmental effects described in the RC PEIS.

General Description of the Affected Environment for Project 2

While coral reefs are dynamic and highly variable environments, they do share certain qualities that are somewhat universal. This Restoration Plan and NEPA Evaluation incorporates by reference the affected environment description of coral reefs in the RC PEIS.

Generally, the RC PEIS describes coral reefs as among the most productive of marine ecosystems and critically important for the ecosystem services they provide. These services include providing habitat and food for thousands of species of fish, shellfish, and other marine life. In addition to their exceptionally important ecological role, coral reefs also provide numerous human use values. These include, but are not limited to: shoreline protection (through dissipation of wave energy); habitat for reef and pelagic fish species (re: human food/subsistence); diving, snorkeling, and other recreational opportunities and associated economic benefits; and potential medicinal uses. For a more detailed discussion of the affected environment in and around coral reefs, refer to Chapter 3 of the RC PEIS.

ONMS has made the determination that the RC PEIS contains an applicable description of the affected environment generally associated with the restoration activities described in this Draft Restoration Plan and NEPA Evaluation.

Impacts Analyzed for Project 2

The RC PEIS impacts analysis includes a description of the impacts associated with coral restoration activities discussed in this Draft Restoration Plan and NEPA Evaluation. That information can be found in Chapter 4 and Table 11 of the RC PEIS, and more specifically, in Section 4.5.2.6.1 and Table 25 of the RC PEIS. In general, the environmental impacts from coral restoration activities have been analyzed under the RC PEIS. Direct, indirect, and cumulative impacts to relevant resources (geology and soils, water resources, living coastal and marine resources and EFH, threatened and endangered species, cultural and historic resources, land use and recreation, and socioeconomics) under the preferred alternative are also fully summarized in the NEPA Inclusion Analysis in Appendix A of this document.

ONMS has also determined that the preferred alternative would not have adverse impacts beyond the scope of those analyzed in the RC PEIS, or meet any other criteria for exclusion from analysis (refer to Table 10 – "List of project activities and criteria for exclusion from this analysis" in the RC PEIS). Ultimately, the RC PEIS concludes that the anticipated impacts would not be significant; ONMS proposes to adopt that conclusion and the analysis in this case. A more detailed description of ONMS' justification for doing so can be found in the NEPA inclusion analysis (Appendix A).

Conclusion for Project 2

Through the analysis in this Draft Restoration Plan and NEPA Evaluation, ONMS has determined that the corresponding Project 2 description and impacts fall entirely within the scope of the project descriptions and analysis contained in the RC PEIS sections referenced above. Moreover, there are no geographic, project- or site-specific considerations, sensitivities, unique habitat, or resources that warrant additional NEPA analyses beyond what is provided in the RC PEIS. The public is invited to provide feedback on ONMS' proposed action, the alternatives and the analysis conducted in the Draft Restoration Plan and NEPA Evaluation, which included a draft inclusion analysis.

ONMS would generate an inclusion memorandum, which would memorialize ONMS' decision to rely on the RC PEIS and adopt the final NEPA inclusion analysis. The inclusion memorandum would be finalized and signed prior to approval and public release of the Final Restoration Plan and NEPA Evaluation for the YFD-70 Dry Dock.

Evaluation of the No Action/Natural Recovery Alternative

ONMS evaluated the impacts of the no action/natural recovery alternative on geology and soils, water, air, living coastal and marine resources and EFH, threatened and endangered species, cultural and historic resources, land use and recreation, and socioeconomics. As noted above, the no action/natural recovery is a non-preferred alternative because it fails to compensate the public for losses associated with the incident; however, NEPA mandates that ONMS evaluate the environmental impacts of a no action alternative.

By definition, the no action/natural recovery alternative lacks physical interaction with the environment. Accordingly, the no action/natural recovery alternative would result in no direct impacts on any of the elements of the environment listed above. However, if ONMS undertook

the no action/natural recovery alternative, the environment would not benefit from the ecological benefits generated by active restoration.

For example, future vessel groundings in the area could injure corals or benthic habitat, and, in the absence of the type of outplanting activity described under the preferred alternative, the injuries would remain or worsen. Conversely, the type of active restoration under the preferred alternative would restore injured areas and potentially prevent further injury.

Based on this evaluation, ONMS has concluded that the no action/natural recovery alternative would have either no effect or minor to moderate short- or long-term indirect adverse impacts on the environment.

Other Applicable Environmental Laws and Regulations

This restoration plan does not authorize or approve removal of any individual target in Project 1. Any identified target determined suitable for removal under the administrative guidance of this restoration plan would be subject to all laws and regulations that are applicable during the time of the planned action. Additionally, implementation of target removal may involve activities otherwise prohibited by MBNMS or GFNMS regulations (see 15 C.F.R. §922.132 and §922.82) and could require a permit under the NMSA. Determinations for further environmental compliance would occur for all specific identified targets and would be documented within the annual target report.

For Project 2, conducting some of the proposed restoration activities would involve activities otherwise prohibited by MBNMS and GFNMS regulations (see 15 C.F.R. §922.132 and §922.82) such as: altering the submerged lands of the sanctuary, placing a structure on the submerged lands of the sanctuary, abandonment of the coral pots in the sanctuary, and discharge of material. As such, Project 2 may require an ONMS authorization or permit. The project team would ensure permitting and any further consultation requirements are met, when project details, including location and dates, are confirmed.

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Appendix A: NEPA Inclusion Analysis

I. Identifying Project Information

A. Project name: YFD-70 Dry Dock

B. Project state: California

C. Project proponent/applicant: Office of National Marine Sanctuaries (ONMS)

D. Project contact: Maria Brown, Superintendent, ONMS/Greater Farallones and Cordell Bank National Marine Sanctuaries

II. Other Federal Partners and Level of NEPA Analysis

A. Has another Federal agency completed NEPA? No

B. Is ONMS the lead Federal agency for this NEPA analysis? Yes

III. Project Description / Scope of Activities for Analysis

A. Describe the full scope of the project

ONMS prepared a Draft Restoration Plan (RP)/National Environmental Policy Act Evaluation (RP/NEPA) for a Natural Resource Damage Assessment (NRDA) case for the YFD-70 Dry Dock ("YFD-70") sinking in the Monterey Bay National Marine Sanctuary (MBNMS). The Draft RP/NEPA Evaluation selected a preferred alternative that represented the best approach to implement compensatory restoration of natural resources and services injured as a result of the deposition of the YFD-70 on the submerged lands of MBNMS. The preferred alternative is to conduct two projects that aim to restore important benthic habitats within Greater Farallones National Marine Sanctuary (GFNMS) and MBNMS. Project 1: Target[6] Removal compensates for injured seafloor habitat and Project 2: Restoring Coral Communities with Outplants compensates for injured biota and will provide important living structure that serves as vertical habitat for associated species. Together, both projects will help restore the habitat, biota, living structure, and ecological services that were injured or lost as a result of the deposition of the YFD-70. ONMS has analyzed the restoration projects and their environmental effects and tiers from the 2015 NOAA Restoration Center Programmatic Environmental Impact Statement for habitat restoration activities implemented throughout the coastal United States (RC PEIS). This Inclusion Analysis provides the NEPA review for ONMS's preferred alternative described more fully in the Draft RP/NEPA Evaluation and summarized below.

B. Describe the proposed action

[6] Targets include objects/vessels/vehicles of all sizes that can be derelict, abandoned, grounded or sunken and discarded objects such as shipping containers or crab pots.

The proposed action is the preferred alternative that consists of two projects.

Project 1: Target Removal - ONMS proposes to remove a number of predefined targets from MBNMS and GFNMS, ranging in locations from southern Mendocino County to Point Sur, in Monterey County in order to meet the goal of compensatory restoration of similar seascapes. Targets will be removed from the shoreline to seafloor depths no greater than 150 feet. ONMS will remove these targets from multiple habitat types including rocky reefs, sandy beaches, eelgrass beds, and hard, mixed, and soft sediments from the seafloor to achieve a range of service benefits. The targets will be determined annually and outlined in an annual target report.

Project 2: Restoring Coral Communities with Outplants - ONMS staff and partners who plan and implement coral restoration projects within GFNMS and MBNMS will work together to restore the coral communities. Coral collection, processing, and transplantation methods will follow established and proven techniques (Boch et al. 2019, 2020), with some improvements for the use of eco-friendly materials (e.g., cardboard and rocks) in place of plastic.

The project will consist of these components:

- Pre-outplanting site selection, coral collection, and processing for outplanting;
- Coral outplanting; and
- Restoration effectiveness monitoring

The objective is to plant up to 300 corals on the seafloor during the first three years of the project, which will support the subsequent passive regeneration and restoration of the coral colonies over the final seven years of the project.

C. List the types of activities being conducted in this project:

1. Riverine and Coastal Habitat Restoration

    a) Debris Removal

    b) Coral Reef Restoration

IV. Project Impact Analysis

A. Are the activities to be carried out under this project fully described in Section 2.2 of the NOAA RC PEIS? Yes

B. Are the specific impacts that are likely to result from this project fully described in Section 4.5.2 of the NOAA RC PEIS? Yes

C. Does the level of adverse impact for the project exceed that described in Table 11 of the NOAA RC PEIS for any resource, including significant adverse impact? No

D. Describe the project impacts to resources (including beneficial impacts) and any mitigating measures being implemented.

Project 1: Target Removal

The removal of targets from the sanctuaries will provide a long-term benefit to sanctuary resources through the immediate removal of pollution and marine debris sources. Removing targets prevents the objects and associated materials from scattering into the sanctuaries as the targets breakdown and deteriorate and also prevents large heavy objects (such as steel vessel hulls) from shifting and dragging over time causing ongoing injury to substrates and structure-forming living habitats throughout the seascapes of GFNMS and MBNMS.

Salvage operations do, however, have the potential to cause short-term biological as well as physical impacts. Direct biological impacts can include disturbances to birds and marine mammals from the presence of aircraft (typically heavy lift helicopters that are used to remove large items), barges, cranes, and other large, noisy machinery and equipment. Aircraft, salvage vessels, and other large machinery can cause roosting or rafting birds to flush and fly away, reducing critical resting time for the animals. Along the shoreline, nesting birds may also be disturbed and abandon their nests, resulting in decreased reproductive success for those seabird colonies. Lights and loud noise can also attract or distract seabirds, fish and other marine life, thereby disturbing their normal feeding or resting behavior.

Direct physical impacts from salvage operations can include the dragging of large objects across sensitive habitat (such as rocky reef or seagrass beds) in those cases where it is logistically too difficult to airlift targets vertically to successfully remove them. Damage can be acute in locations where there is hard substrate (offshore rocks or intertidal rocky reef).

Dragging targets across hard substrate can cause biological and physical impacts. Physical impacts can be temporary in soft habitat where biological resources are not present, but may be permanent as a result of scraping, gouging, scarring, and/or removal of rocky reef habitat or scouring of sediment which prevents seagrass species, like eelgrass, from growing or colonizing an area. Biological impacts can include crushing of living organisms, such as barnacles or other encrusting organisms that are either sessile or have limited mobility such as black abalone. In intertidal areas, indirect biological impacts may also occur from geologic debris (reef rubble) potentially crushing or smothering intertidal organisms nearby.

Direct physical impacts to the seafloor can also result from the deployment of temporary anchor deployments during the salvage process (such as anchors used to moor barges or other support vessels or anchors used to secure pollution boom, other sorbents, fish curtains, or other noise attenuation devices). These anchors can damage sensitive flora, like eelgrass, and scour the seafloor reducing the potential for seafloor flora to regrow in certain areas.

During the dragging, cutting, or dismantling on any vessel or large piece of material, it is possible that small amounts of loose product (e.g., fuel, hydraulic oil, lubricating oil, etc.) may be released into the environment resulting in temporary water quality impacts.

For some shoreline salvage operations, the use of a crane, pulling cables, anchoring systems, and other equipment associated with the use of heavy equipment along adjacent bluffs may cause direct impacts to some upland habitats as well as indirect disturbance to shoreline communities if upland erosion is increased. Increased upland erosion along the cliff could result in smothering or scouring impacts to nearshore portions of the reef potentially adding to direct

debris-related impacts and/or delaying natural recovery of debris-impacted areas (e.g., algae, invertebrates, and surfgrass).

Impacts on a full list of species and habitats to consider during planned salvage operations are available through MBNMS final Management Plan and Environmental Assessment and GFNMS final Management Plan and Environmental Impact Statement (GFNMS 2014, MBNMS 2021).

To minimize and/or prevent direct and indirect impacts to both biota and the physical environment, best management practices and other mitigation measures will be identified and incorporated into salvage plans to the greatest extent feasible. For example, salvage operations and plans would identify resources at risk in the area (such as sensitive breeding, feeding, or nesting/pupping wildlife) and seasonal concerns for those populations and then develop avoidance measures or other procedures to avoid impacting wildlife. Avoidance measures could include requiring distance buffers to limit how closely aircraft and heavy machinery can operate near sensitive rookeries/haulouts, only allowing salvage work to proceed during certain seasons when sensitive wildlife is not present, and requiring that trained wildlife observers be present on site during all salvage operations. For any project that requires the use of aircraft, flight plans will be established that avoid flying near or over sensitive sites and that require takeoff and landing zones sufficiently far from sensitive wildlife areas.

For in-water work, other mitigation measures would be employed, such as using float bags and other lightering techniques to add buoyancy to wrecked targets to reduce drag weight on the seafloor, using divers for cutting/dismantling activities instead of heavier machinery, avoiding anchoring barges or support vessels in sensitive habitats (like seagrass areas), and working at the appropriate tides to lighten target weights and reduce the potential for seafloor impacts. Similarly, proposed salvage methods by vendors would be carefully reviewed and modified by ONMS as needed to ensure operations are conducted in a manner that minimizes or avoids harm to sanctuary resources.

Project 2: Restoring Coral Communities with Outplants

Direct environmental effects include the small-scale collection of coral branches from large dense coral colonies. The corals that will be collected tend to be long-lived and slow-growing. However, the removal of small branches from larger colonies does not kill the colony. And, the benefit of transplanting corals in depauperate areas outweighs any small-scale removal from dense areas. The ROV may possibly disturb the seafloor if it incidentally comes into contact with the bottom. For example, if MBARI's ROV Doc Ricketts is used, it has a footprint of 6 feet wide by 12 feet long. The direct effects on the seabed from the ROV can cause localized smothering of benthic organisms. Prior to the ROV making any contact with the seafloor, the ROV pilot will be able to evaluate each touchdown (if required), through the ROV's camera system. This should ensure that the collections prevent or minimize any damage to sensitive habitats. The ROV may create sediment plumes and water quality turbidity, which could potentially cause short-term disturbance to nearby filter feeding organisms. The lights and sound from the ROV could also cause short-term behavioral changes to fishes in the area, but again potentially causing only minimal and temporary disturbance.

The proposed restoration activities in Project 2 involve ROV operations deployed from a vessel (Figures 5-6). Deployment of ROVs can injure 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 rarely may pose an entanglement risk for marine mammals and sea turtles. The operation of ROVs will be periodic and low-intensity, under best management practices to limit risk of impact to the seafloor and entanglement to marine mammals and sea turtles, and will be used to locate, collect, and transplant (e.g., place coral pots on seabed) corals.

If the ROV were to accidentally or intentionally collide with the seafloor, the impacts to benthic habitat and species on the seafloor would be minimal and temporary. Likelihood of entanglement is very 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.

Based on historic ROV collection activities conducted by ONMS, collection methods have only short-term negligible effects on the surrounding benthic environment from the ROV. Only ROV pilots with extensive experience in ecological studies will be used. Due to the low intensity of anticipated operations of these types of vehicles, the low likelihood of an accidental collision or grounding, and the utilization of 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 minor. Since Project 2 will only include non-invasive monitoring activities with ROV operations, no further impacts are anticipated.

Direct impacts include the small-scale collection of up to 300 coral branches from large dense coral colonies. Corals tend to be long-lived and slow-growing. However, the removal of small branches from larger colonies does not destroy the colony. None of the corals that will be collected are threatened or endangered species. ONMS expects the coral collection methods to have only minimal impact on the larger coral colonies.

Other direct impacts include minor disturbance of the soft bottom habitat during collection and placement of coral pots on the seafloor. The untethered placement of cement-weighted pots directly on the seafloor has proven effective, with negligible movement between repeated visits. The coral pots, constructed of cardboard and cement, will eventually deteriorate, dissolve, and disperse among the surrounding sediment. Cardboard will disintegrate in water in 50-98 days (Hoellein et al., 2014). ONMS anticipates that the cement will be incorporated into the coral base as it attaches to the rocks and that the cement will disintegrate into sand/rubble after several years.

The placement and discharge of approximately 300 small coral pots (4-inch diameter, 2-pound pot) is expected to be a short-term, negligible impact. No indirect impacts are expected as a result of this project.

The benefit of transplanting corals to depauperate areas outweighs any small-scale coral removal from dense areas, and ultimate discharge of cement and cardboard. A small area of seafloor would be temporarily disturbed as a result of this project, but should return to its natural state shortly after natural deterioration of the coral pot materials (e.g., cardboard and

cement). As in a similar study (Boch et al. 2019), ONMS expects this activity will have only negligible, short-term adverse impacts.

In addition, the transplantation of corals to previously trawled areas is expected to enhance the seafloor with structure-forming coral habitat. This project is unlikely to adversely affect Essential Fish Habitat (EFH), but rather improve or EFH; an expected long-term beneficial impact to the seafloor and surrounding habitat.

E. Describe any potential cumulative impacts that may result from past, present or reasonably foreseeable future actions (beneficial or adverse).

Under NEPA, federal agencies are required to consider the effects of their proposed actions within the affected environment, taking into consideration other activities that have occurred, are occurring, and are likely to occur in the future (e.g., past, present, and reasonably foreseeable future actions) (40 C.F.R. § 1508.7). The RC PEIS generally addresses the cumulative impacts expected with the types of habitat restoration typically undertaken by ONMS, and that discussion is incorporated here by reference.

Cumulative negative impacts are not expected to be significant as defined under NEPA. Cumulative impacts to relevant resources geology and soils, water resources, living coastal and marine resources and EFH, threatened and endangered species, cultural and historic resources, land uses, and demographics are summarized in the Inclusion Analysis under Project Impact Analysis. Additional discussion for each alternative and project that is relevant to the scope and scale of affected seascape is provided below. Overall, ONMS expects that there will be long-term, positive cumulative effects from the positive cumulative benefits of these proposed restoration actions in the preferred alternative.

Preferred Alternative

Project 1: Target Removal

Overall, the adverse impacts from target removals are likely to be short-term and only minor to moderate when they do occur. As most project sites will be isolated from each other, and will occur at different times, cumulative short-term target removal impacts to natural and cultural resources are unlikely. On the other hand, because projects are aimed at the immediate removal of pollution and marine debris sources, any successful restoration project should lead to longer-term beneficial impacts on the community, living coastal and marine resources, protected and listed species under the federal Endangered Species Act, and the seascape between Point Sur and Point Arena. Because project implementation periods (and the associated adverse effects from target removal) are short-term, and the beneficial impacts from each target removal are long-term, generally, the cumulative impact of the proposed action program-wide is estimated to have a net beneficial impact to the identified resources, because the long-term benefits essentially reflect preventing the degradation of water quality, habitat and ecosystem services.

Project 2: Restoring Coral Communities with Outplants

Overall, the adverse impacts from coral outplanting are short-term and negligible. No negative cumulative effects are expected as a result of this project. The long-term, positive cumulative benefits could include providing structure-forming living seafloor habitat that may improve habitat for fish and fishery production.

"No Action" Alternative

Cumulatively, there may be long-term adverse effects to the physical and biological resources of GFNMS and MBNMS if the "no action" alternative were selected because no active restoration would occur. Cumulative impacts from the "no action" alternative could be significant as defined under NEPA depending on the number of targets not removed.

F. Describe the public outreach and/or opportunities for public comment that have taken place to this point. Are there any future opportunities for public input anticipated?

   ONMS will accept public comment for 30 days from the date of publication of the Draft Restoration Plan/NEPA Evaluation on the MBNMS and GFNMS websites. ONMS will evaluate public comment and consider whether revisions are necessary before publishing the final restoration plan.

G. Have any public comments raised issues of scientific/environmental controversy. Please describe. N/A

H. Describe the most common positive and negative public comments on issues other than scientific controversy described in G. N/A

V. NEPA Determination

A. This action is completely covered by the impact analysis within the NOAA RC Programmatic EIS (PEIS). It requires no further environmental review. An EIS Inclusion Document will be prepared.