
Abstract

Title of Proposed Action: Supplemental Restoration Plan/ Memorandum for the Record for the 18 May 2011 Omega Air 707 Tanker Crash at Naval Base Ventura County, Point Mugu, California.

Project Location: Naval Base Ventura County, Point Mugu, California

Lead Trustee for the EA: Department of the Navy, Navy Region Southwest

Other Trustees: U.S. Dept. of the Interior, U.S. Fish and Wildlife Service; California Department of Fish and Wildlife - Office of Spill Prevention and Response

Affected Region: Ventura County, California

Action Proponent: Department of the Navy, Navy Region Southwest

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Date: June 2023

The Department of the Navy, Navy Region Southwest, along with the U.S. Dept. of the Interior, as represented by the U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife, Office of Spill Prevention and Response, as the Natural Resource Damage Assessment (NRDA) Trustees have prepared this Supplemental Restoration Plan/Memorandum for the Record (SRP/MFR) in accordance with the Oil Pollution Act (OPA) and its accompanying regulations and the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality Regulations and Navy regulations for implementing NEPA and the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act - Government Code 8670.1 et seq. (OSPRA). The SRP/MFR presents and evaluates compensatory restoration projects to account for interim natural resource losses resulting from Omega Air's 2011 air tanker crash and release of jet fuel into wetlands on Naval Base Ventura County, Point Mugu. The projects would provide debris removal, upland buffer revegetation and European sea lavender eradication within the wetlands which would improve habitat for birds, fish, and other biota, and provide other ecological services such as sediment stabilization and storm buffering. The projects would occur after funding is secured from the National Pollution Funds Center; implementation of restoration activities would initially take approximately eight weeks and then there would be five years of monitoring and potentially more removal and/or restoration activities conducted. This SRP/MFR evaluates the potential environmental impacts associated with the two projects to the following resource areas: water resources, cultural resources, and biological resources.

1.1 Introduction/Background

This Supplemental Restoration Plan and Memorandum for the Record (SRP/MFR) was prepared by the Natural Resources Damage Assessment (NRDA) Trustees to modify the original restoration plan and to assess the environmental impacts, if any, from the modification in order to address compensatory restoration for natural resources injured by the 18 May 2011 Omega Air tanker crash into Mugu lagoon at Naval Base Ventura County (NBVC).

In 2016, the Trustees published a *Damage Assessment Restoration Plan/ Environmental Assessment (DARP/EA) for the 18 May 2011 Omega Air 707 Tanker Crash at Naval Base Ventura County, Point Mugu, California*. It was developed in accordance with the Oil Pollution Act of 1990 (OPA), 33 United States Code (U.S.C.) §2701, its implementing regulations, 15 Code of Federal Regulations (CFR) part 990, and the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (OSPRA)- Government Code 8670.1 et seq. Under the OPA and OSPRA, designated Trustee agencies are responsible to the general public for ensuring the assessment of impacts and implementation of actions to restore, rehabilitate, replace, or acquire the equivalent of the natural resources or services injured as a result of an unpermitted discharge of oil.

As explained in the DARP/EA, the federal and state Trustees for this incident include the U.S. Navy (Navy) as Lead Trustee, the U.S. Department of the Interior (DOI), as represented by U.S. Fish and Wildlife (USFWS), and California Department of Fish and Wildlife Oil Spill Prevention and Response (CDFW-OSPR). The US Navy and DOI are designated Trustees for natural resources pursuant to subpart G of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR § 300.600 et seq.) and Executive Order 12580 (3 CFR, 1987 Comp. p. 193, 52 Fed. Reg. 2923 (January 23, 1987) as amended by Executive Order 12777 (56 Fed. Reg. 54757 [October 19, 1991])). CDFW-OSPR has been designated as a state Trustee for natural resources pursuant to Section 1006(b)(3) of the OPA and the administrator for oil spill response under section 8670.4 of the OSPRA. Collectively these government agencies are referred to as the “Trustees” or the “Natural Resource Trustees.” Each of the agencies acts as a Natural Resource Trustee pursuant to the OPA and OSPRA.

The DARP/EA documented the incident, the data collected and the analysis that support the Trustees' evaluation of:

- 1) injuries to natural resources and services caused by the Omega Air tanker crash;
- 2) proposed restoration alternatives; and
- 3) rationale for the Trustees' preferred restoration alternative.

The original DARP/EA identified and evaluated two restoration project alternatives ((1) Laguna Road Culvert Installation and Tidal Channel Grading; and (2) Beach Road Berm and Sewer Line Removal and Tidal Channel Grading), and included regulatory consultations for a preferred alternative. Subsequently, Commander Navy Region Southwest (CNRSW) selected Alternative 1, the Laguna Road Culvert Installation, and signed a Finding of No Significant Impact (FONSI) on 6 June 2016 on behalf of the Trustees.

1.2 Project Changes and Rationale for Supplementation

In the intervening years between signing the DARP/EA FONSI in 2016 and present, the Trustees tried to recover damages to implement the selected alternative from the Responsible Party (RP). The RP failed to

provide damages to sufficiently compensate the public through restoration identified in the 2016 DARP/EA. The Trustees then presented a claim to the National Pollution Fund Center (NPFC). The NPFC has asked questions and is considering the claim. However, the primary reason for the supplementation of the original DARP/EA is the removal of the two restoration projects from further consideration and implementation. Naval Base Ventura County (NBVC) Point Mugu, the installation affected by the incident, has created a wetland mitigation bank and those two projects considered in the DARP/EA are now included in the wetland mitigation bank program. Therefore, a new restoration project (or projects) is needed to fulfill the Trustee's requirement for compensatory mitigation in accordance with OPA. The Trustees determined that any newly proposed restoration project(s) would also need environmental impact analysis.

This document relies on the original DARP/EA to provide explanations of the incident, the injury assessment, the habitat assessment and habitat equivalency analysis process, as well as descriptions of the affected environment. There has been no change to that information. The SRP/MFR is intended to provide a description of the newly proposed restoration projects and their benefits towards meeting the compensatory mitigation requirements described in the original DARP/EA.

This document also addresses the requirements of the National Environmental Policy Act (NEPA), 42 U.S.C. §4321 and the implementing regulations, 40 CFR parts 1500-1508. NEPA requires that federal agencies analyze the potential direct, indirect and cumulative impacts of proposed major federal actions and alternatives; and to involve the public in the process. This SRP/MFR proposes new restoration projects and evaluates their potential impacts to the environment.

1.3 Injury Assessment & Habitat Equivalency

The NRDA Trustees, through the DARP/EA, outlined the injury assessment process which involved a benthic macro invertebrate (BMI) survey and a habitat equivalency analysis (HEA) to calculate compensation for impacts to ecological services required by NRDA. The HEA process seeks to answer the question, "what scale of compensatory restoration action will compensate for the interim loss of natural resources and services from the time of the incident until full recovery of the resources?" The results of the HEA process were identified in terms of an acreage amount but included considerations of degree and area of impacts, time to recovery, compensatory restoration acreages and service increases, and the time until restoration projects provide full benefit.

In accordance with the NPFC's request, and on behalf of the Trustees, OSPR conducted an Alternative Equivalency Analysis which evaluated the new restoration projects, the subject of this SRP/MFR. (See Appendix A for the Alternative Equivalency Analysis.) The Trustees believe the injury analysis in the original DARP/EA properly characterizes the injury. However, for purposes of adjudication before the NPFC, the Trustees conducted the Alternative Equivalency Analysis to satisfy the NPFC's request for a revised injury analysis. The Trustees apply the "fuel only" approach to the specific facts here, and do not adopt this approach in any other OPA natural resource damage assessments.

The Trustee's analysis concluded that a "fuel only" injury scenario for Zone 1b reduces the quantified injury for that zone by 41 percent. This reduces total injury quantification across all zones from 18.4 discounted service acre-year (dSAY) in the original analysis presented in the DARP/EA to 13.4 dSAY. (See Alternative Equivalency Analysis for Omega... Rev 20230428). The Alternative Equivalency Analysis also determined that the proposed restoration projects would provide 11.31 dSAY in total credit under the scenario with the highest quantified benefits, thus not fully compensating for the injury.

1.4 Regulatory Setting

OPA and OSPRA require the Natural Resource Trustees to develop and implement plans to restore, rehabilitate, replace, or acquire the equivalent of injured natural resources under their trusteeship and provide the public with an opportunity to review and comment on these plans prior to implementation. The Trustees jointly prepared a final DARP/EA, in accordance with OPA and OSPRA requirements and applicable regulations and guidance concerning restoration planning and implementation.

That document also served, in part, as the agencies' compliance with NEPA. (*See*, 42 U.S.C. § 4371 *et seq.* and its implementing regulations, 40 CFR Parts 1500-1508).

The Navy is preparing this SRP/MFR to comply with the same federal laws, applicable state law, statutes, regulations, and policies that were, and continue to be pertinent to the implementation of the proposed action, including the following:

- NEPA (42 U.S.C. §4321 *et seq.*), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment
- Oil pollution Act of 1990 (33 U.S.C. § 2701 *et seq.*) and its accompanying regulations (15 CFR part 990)
- National Oceanic and Atmospheric Administration (NOAA) Damage Assessment Regulations (15 CFR Part 990 *et seq.*)
- Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR parts 1500-1508)
- Navy regulations for implementing NEPA (32 CFR part 775), which provides Navy policy for implementing CEQ regulations and NEPA
- Clean Air Act (CAA) (42 U.S.C. §7401 *et seq.*)
- Clean Water Act (CWA) (33 U.S.C. §1251 *et seq.*)
- Coastal Zone Management Act (CZMA) (16 U.S.C. §1451 *et seq.*)
- National Historic Preservation Act (NHPA) (16 U.S.C. §470 *et seq.*)
- Endangered Species Act (ESA) (16 U.S.C. §1531 *et seq.*)
- Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSA) (16 U.S.C. §1801 *et seq.*)
- Marine Mammal Protection Act (MMPA) (16 U.S.C. §1361 *et seq.*)
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. §703-712)
- Bald and Golden Eagle Protection Act (16 U.S.C. §668-668d)
- EO 11988, Floodplain Management
- EO 13653, Preparing the U.S. for Impacts of Climate Change
- the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act - Govt. Code 8670.1 *et seq.* (OSPRA)

This SRP/MFR includes an analysis of potential environmental impacts associated with the new restoration projects. The study area for each resource analyzed may differ due to how the Proposed Action interacts with or impacts the resource. All environmental resource areas are evaluated in some level of detail in this document.

1.5 Public Involvement and Plan Implementation

The OPA and the National Oceanic and Atmospheric Administration Damage Assessment Regulations (15 CFR Part 990 *et seq.*), as well as NEPA and its implementing regulations (40 CFR Parts 1500-1508), and OSPRA and its regulations, require that the public be provided an opportunity to review and comment on oil spill restoration plans. Therefore, public involvement in the original DARP/EA process began on 17 July 2015 with a Federal Register publication of a Notice of Intent to Proceed with Restoration Planning and Preparation of a DARP/EA. A similar notice was published in the local newspaper lasted for 30 days from 17 July 2015 through 17 August 2015.

Then, a Draft DARP/EA (5 February - 5 March 2016) and Final DARP/EA and FONSI (6 Jun 2016) were advertised in the local newspaper for the community adjacent to the oil spill and online at the Navy Region Southwest website. No public comments were received from the Notice of Intent, the draft and final DARP/EAs.

Due to the time elapsed between the actual oil spill incident in 2011, the DARP/EA public notifications and review periods between 2015 and 2016 and lack of any comments received, the Trustee intend to conduct an abbreviated public review comment period with a cost-effective process. The SRP/MFR will be posted on the Navy Region Southwest webpage for projects under public review (<https://www.cnic.navy.mil/navysouthwestprojects>) as well as on the social media pages of NBVC and Navy Region Southwest for a period of 15 days.

1.6 Other Agency Coordination

The DARP/EA resulted in a requirement for and completion of three regulatory consultations for the proposed restoration alternative. The Trustees completed CZMA compliance through receipt of a concurrence on its negative determination (ND-0039-15) from the California Coastal Commission (CCC). The Trustees completed MSA compliance through receipt of a concurrence on its No Adverse Effect to Essential Fish Habitat determination from the National Marine Fisheries Service (NMFS). And the Trustees completed NHPA compliance through a concurrence on its No Historic Properties Affected determination from the California State Historic Preservation Office (SHPO).

Due to the benign nature of proposed restoration projects, the Trustees have determined that CZMA, MSA and NHPA compliance is complete either from the original determination or a no effects determination and no further action or consultation with CCC, NMFS or SHPO is required.

2.1 Goals and Objectives of Restoration/Proposed Action

The goal of restoration under OPA and OSPRA is to compensate the public for the loss of natural resources and services resulting from the oil spill. Thus, for a restoration project to be considered, there must be a connection between natural resource injuries and proposed restoration actions. The natural resource injuries identified in the DARP/EA were tidal muting, effects of exposure to jet fuel, complete removal of flora and fauna in excavated areas, destruction and disruption of flora and fauna due to fire and mechanical response activities, die-off of crabs and snails (which are prey items for other species), and benthic macro-invertebrate community changes indicative of acute impacts.

The compensatory restoration goal is to enhance self-sustaining wetlands and buffer areas by improving wetland functional conditions at or through the proposed restoration activities. The restoration objective is to increase native plant cover, and habitat for native fauna, and support federally listed species recovery objectively by restoring hydraulic function and tidal influence at the site.

2.2 Restoration Projects Considered by Supplemental Plan

This supplemental restoration plan analyzes the impacts resulting from three proposed restoration activities:

- 1) Debris Removal;
- 2) Upland Wetland Buffer Revegetation;
- 3) European sea lavender Eradication.

The Trustees have determined that combining the three restoration projects, rather than considering them alternatives to select from, helps achieve the compensatory restoration goals presented in the original DARP/EA. These restoration projects would be implemented after funding is secured from NPFC and after NBVC performs biological resource surveys for special status species (federally threatened and endangered, MBTA, etc.), and updating the existing vegetation maps. In addition, any debris removal efforts would be scheduled outside of nesting season for species identified during the surveys so effects from motorized activities would not affect birds or listed species who may nest in the adjacent beach habitat. The environmental protection measures listed in Section 2.5 of the DARP/EA would be implemented as part of these projects.

The No Action Alternative from the DARP/EA continues to be valid and therefore will not be evaluated further.

The estimated costs for all restoration projects, inclusive of in-house labor, travel, and contracting costs is \$1,011,692.86.

2.2.1 Debris Removal

Although debris from the original Omega aircraft crash was completely removed in 2011, Mugu Lagoon, a 245-acre wetland complex located on NBVC Point Mugu, continues to receive debris from various sources. Due to storm events, tidal action, and being within the watershed for several creeks, the lagoon collects debris such as telephone poles, vehicle tires, appliances, wood pallets and plastic material. Because areas covered by debris provide zero wetland benefit, a proposed project for restoration to compensate the public for the loss of natural resources would be to remove all debris found in Mugu Lagoon. The proposal is to conduct an initial removal action as identified below within the Central Basin of Mugu Lagoon and then provide monitoring and additional removal actions as needed for a period of five years.

Pedestrian visual surveys conducted in October 2022 identified approximately 71 items of debris, such as telephone poles, vehicle tires, appliances, and plastic materials that are visible during low tides (see Figure 2-1 for locations throughout the wetland complex). The Navy estimates that there is approximately 1,026 square feet (0.02 acres) of debris covering the wetland. The removal process would require, where feasible, on-the-ground personnel to gather the debris into piles and secure the debris to pallets for transfer to solid waste collection sites. If items are too large for the on-the-ground personnel to move, then these items would be airlifted and removed from their current location. Riggers would prepare the debris items to be safely airlifted off the wetlands. The debris would be air lifted to a pre-determined location where it will reside for a week or more to allow items to dry out if water logged. All air lifting operations will be conducted by a local helicopter service company that has, in the past, conducted work for NBVC Point Mugu.

Once the debris has had the opportunity to dry, as much as feasibly possible, then using a backhoe or other heavy equipment, the small debris will be placed in 25 cubic yard dumpsters and hauled off NBVC

Point Mugu to an appropriate dump location. Larger debris may need to be hauled off base directly to the appropriate dump location. Telephone pole debris will be sent to one dump location and solid waste will be sent to a different dump location. Vehicle tires will not be accepted at the dumpsites and therefore, an alternative for disposal will need to be determined for this debris (to-be-determined). The project would involve the use of front loader or other heavy equipment to move and helicopters to lift heavy items to 25 cubic yard solid waste dumpsters. Personnel skilled in rigging and operating heavy equipment would be required to support this project. It is estimated that 10 people and 2 dumpsters would be required over five days to pick up all visible debris. Once full, the dumpsters would be trucked to the Simi Valley Landfill and Recycling Center, an approved upland disposal facility. (Omega_mitigation_GCE_narrative_20220728.doc)

Much of the work would occur in lower elevation areas that are periodically inundated by tidal flow. In addition, some of the debris (tires, telephone poles) may breakdown and emit by-products that could harm the marsh ecosystem. Once debris is removed, the area is expected to quickly re-establish marsh vegetation (pers comm V. Vartanian). The project is expected to benefit lower elevation marsh that is functionally similar to the injured habitat from the original incident. It is also expected to provide biological benefits quickly, once implemented. The action would improve the restoration site's water quality and hydrology, habitat for fish and native coastal salt marsh plant diversity and cover.

After the initial debris removal project is completed, monitoring would be conducted for five years. Annual inspection and additional debris removal actions would help ensure the lagoon stays healthy and functional by allowing free flow to continue. Existing utilities (water, sewer and gas lines) are not expected to be encountered during the removal activities. However, periodic road closures may be required during removal activities for large items. The contractor would implement a traffic control plan for the project in order to ensure that no significant traffic or recreational impacts occur.

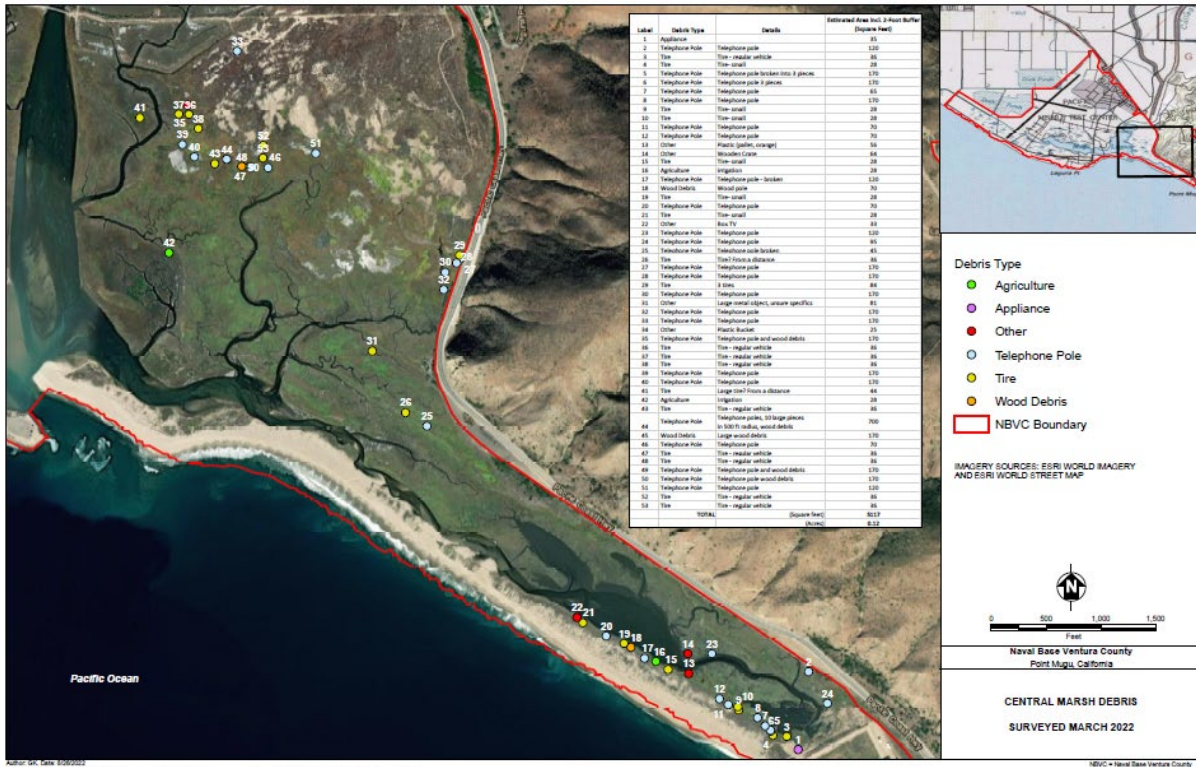


Figure 2-1 Debris Removal Project

2.2.2 Upland Wetland Buffer Revegetation

To achieve the goal of self-sustaining wetlands, the Trustees propose a series of efforts to restore native habitats and to monitor marsh elevation changes due to sediment loading to ensure a fully functioning wetland system in the long term assuming sea level rise results from climate change processes. In general the habitat restoration plans consist of removing non-native plant species currently existing in and re-appearing during the five-year period following initiation of field activities in the project and converting the area back to native habitat. After the non-native vegetation is removed, native plant species seeds or plantings will be used to restore the area.

One specific project site would restore an upland wetland habitat buffer along a berm which separates the North and South Ponds (See Figure 2-2). The North Pond was the location of the original crash site. The project site is approximately 40 feet by 550 feet (0.51 acre) in size and consists of non-native habitat, dominated by ice plant (*Carpobrotus edulis*) species. To help with the propagation of the restored habitat, watering of this area will be conducted by hand or by water truck. Additionally, to meet restoration success criteria, the restored area will likely be monitored for five (5) years and weed control measures will be conducted for five (5) years as well. This restoration work would be largely above the wetted marsh elevations where the Trustees quantified impacts from the incident.

Restoration of berm site would provide increased habitat for marsh birds and invertebrates by supporting a wider range of native fauna associated with the marsh ecosystem. The restoration site may provide additional foraging and nesting habitat for light-footed Ridgway’s rail (*Rallus absoletus levipes*), which have historically nested in the area. Additionally, restored habitat would provide additional foraging and potential nesting habitat for Belding savannah sparrow (*Passerculus sandwichensis beldingi*). It is estimated that restoration activities would last approximately eight weeks and require five years of

monitoring, maintenance and adaptive management. The environmental protection measures listed in Section 2.5 of the DARP/EA would be implemented as part of this alternative.

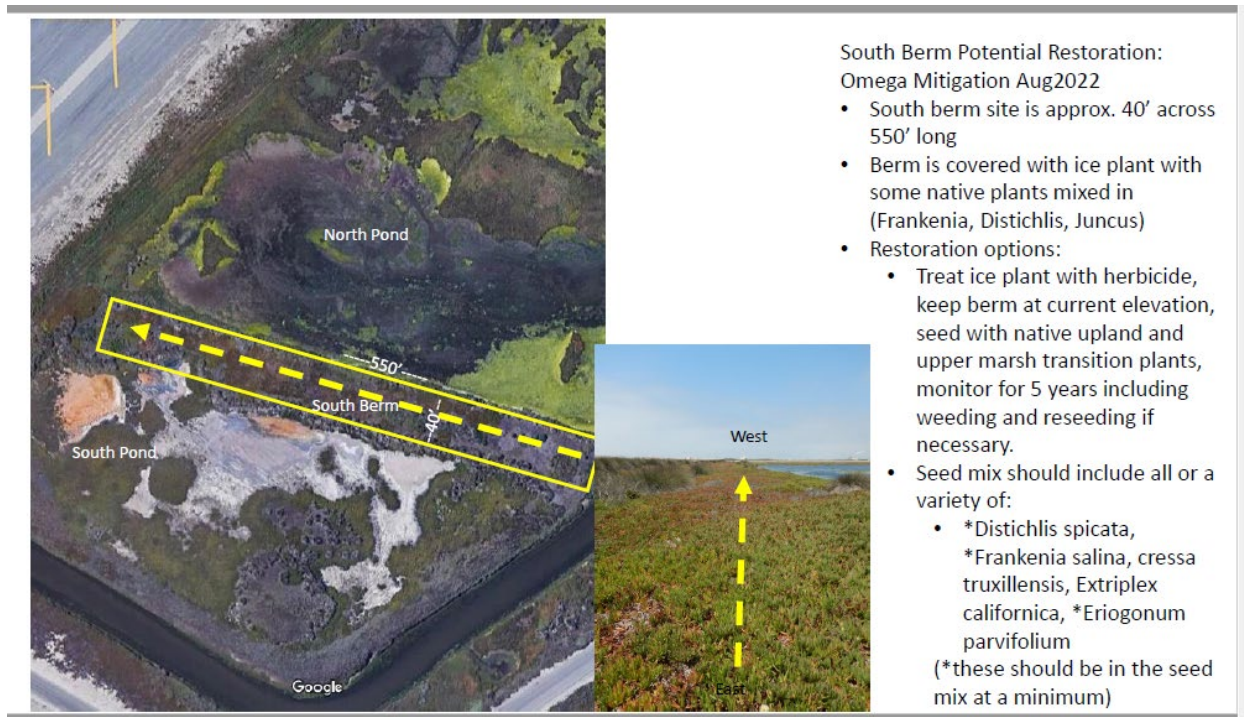


Figure 2-2 Upland Wetland Buffer Revegetation of South Pond Berm

2.2.3 European Sea Lavender Eradication

In addition to the specific restoration site discussed above, the project would survey and map the eastern side of Mugu lagoon area for European sea lavender (*Limonium duriusculum*, commonly referred to as LIDU), an invasive species, to assist with extirpation of the species (Fig 2-3). A “priority 1” site (approximately 180 acres) will be surveyed, with a “priority 2” site (approximately 20 acres) surveyed if funding allows. Once mapped, personnel would return to occupied sites and remove individual plants by hand or treat by covering the plants with black plastic tarp. Personnel would continue visiting the sites throughout the growing season to ensure no seeding occurs and continue removal or treatment as needed. Black plastic tarp will be removed between three and six months after it is placed. After removing the LIDU, personnel would start monitoring for the expected return by natural seed deposition and germination of salt marsh bird’s beak (*Chloropyron maritimum ssp. Maritimum*) in both sites.



Figure 2-3 LIDU Survey Areas

2.3 Environmental Protection Measures

Implementation of any of proposed restoration projects would incorporate the following environmental protection measures, as applicable to the activity, to ensure the avoidance and/or minimization of environmental impacts.

Water Resources

Measure 1. Before restoration activities occur, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared, which would include the type, placement, and maintenance of erosion control features to be used during and following activities. The plan would include:

Placement of Straw Wattle Buffers. Before the start of activities, straw wattle buffers would be placed within and around the project site to reduce surface water flow velocities, and retard soil erosion and off-site transport;

Avoidance of Excavated Areas. Any construction equipment would be directed to avoid places where pavement has been removed to prevent soil erosion; and

Stockpiled Materials. Sites for temporary stockpiling and handling of recyclable wastes would be established on site. When appropriate, stockpiled materials would be covered with tarps or other suitable materials, and the piles would be enclosed with a sediment fence to prevent wind- or rain-induced runoff and dispersion. All contaminated materials would be disposed of in accordance with applicable federal, state, and local requirements.

As part of the SWPPP, Best Management Practices (BMPs) would be implemented to prevent inadvertent runoff of contaminants, such as construction debris, petroleum products, and hazardous materials. Specifically, BMPs would include:

Tarping of Washout Trap. If rain occurs, place a tarp or some other impermeable material over bare areas to avoid inadvertent runoff with contaminants;

Vehicle and Work Area Maintenance. Upon entering the site and daily thereafter, equipment would be inspected and maintained prior to working on site. Any leaks or hoses/fittings in poor condition would be repaired before the equipment begins work. Construction equipment would be staged on site in designated staging areas. All vehicles leaving the site would be inspected to prevent dirt/debris from being transported off site. All material/waste storage areas would be inspected daily to ensure containers are in good condition. All storm drain inlets in the work area would be protected to prevent dust and/or debris from entering the drain(s);

Storm drain catch basins in the restoration area shall be covered so that sediment and debris do not enter the catch basins during activities;

Sediment and debris from the work site shall be swept up and properly disposed, so that they will not be tracked off site and enter a storm drain or receiving water;

For projects that occur during the rainy season (October through May), any soil, gravel, or debris stockpiles shall be covered/bermed to prevent rain from washing away the stockpiles;

If metal cutting, grinding, or welding is part of the project (such as concrete reinforcing bars or metal fencing), measures shall be put in place to prevent those pollutants from entering the water or storm drain systems. Also, at a minimum, metal slag/residues/shavings must be swept up and properly disposed of at the end of each work day;

Drip pans shall be placed under equipment to catch leaks. These drip pans shall be cleaned periodically. During rain events, these drip pans shall be moved so that the storm water runoff does not become contaminated from their contents;

Wash water and residue from debris removal or habitat revegetation efforts shall not be discharged into the storm drain or sanitary sewer systems. Wash water shall be contained in a concrete washout area and allowed to evaporate, with the remaining solids disposed of as solid waste. Contractor may request from installation's environmental staff but is not guaranteed, the option to discharge wash water onto a pervious soil surface and allow it to infiltrate into the soil. Any remaining residue shall be disposed of as solid waste;

The project shall avoid the use of galvanized materials, or add an additional coating to the material to reduce the potential for zinc leaching into surrounding lands. Examples of items that may contain galvanized materials include fencing, flagpoles, corrugated roofing used in lean-to sheds, and sacrificial anodes;

If BMPs currently in place are found to be ineffective in controlling storm water pollution, they

shall be amended as soon as possible to correct the problem; and

Hazardous Materials Management Plan. A Hazardous Materials Plan would be prepared prior to operation of demolition and construction equipment. This plan would include, but not necessarily be limited to:

1. Specific bermed equipment maintenance and refueling areas;
2. Bermed and lined hazardous material storage areas on site that are covered during the rainy season;
3. Hazardous material spill cleanup equipment on site (e.g., sorbent pads, shovels, and bags to place contaminated soil in);
4. Workers trained in location and use of cleanup equipment;
5. Material Safety Data Sheets for all hazardous materials expected to be used. This includes paints, adhesives, and any other possible product that has a Material Safety Data Sheet with it; and
6. Hazardous Waste Generation information to include what materials are to go out as hazardous waste in what volume, who is transporting it, who shall sign the manifests for which type of wastes, and where the hazardous waste is going.

This is a list of minimum BMPs that should be implemented. Additional BMPs may be required depending on the specific project. Construction project managers would work with NBVC environmental representatives to ensure the project meets both environmental compliance requirements and project timelines.

Air Quality/Climate Change

Measure 2. Dust control measures would be implemented to comply with the requirements of Ventura County Air Pollution Control District Rule 55, Fugitive Dust, during all proposed ground disturbance activities.

Measure 3. Construction equipment control measures would be implemented during all proposed activities, where feasible.

1. Maintain equipment according to manufacturer specifications.
2. Restrict idling of equipment and trucks to a maximum of five minutes at any location.
3. Use diesel oxidation catalysts and/or catalyzed diesel particulate traps.
4. Use electricity from power poles rather than temporary diesel- or gasoline-powered generators.
5. Provide temporary traffic control, such as a flag person, during all phases of construction and/or demolition activities to maintain smooth traffic flow.
6. Keep construction/demolition equipment and equipment staging areas away from sensitive receptor areas.
7. Re-route construction trucks away from congested streets or sensitive receptor areas.
8. Use construction equipment with engines that meet U.S. Environmental Protection Agency Tier 3

and 4 non-road standards.

9. Use alternatively fueled construction equipment, such as compressed natural gas, liquefied natural gas, or electric where practicable.

Public Health and Safety

Measure 4. Prior to the start of restoration activities, a Health and Safety Plan would be prepared by the Contractor, to describe the strategy for handling and disposing of all demolition debris and maximizing diversion of the demolition waste from landfills through recycling. Personal Protection Plan standards for venomous insect protection will be included in the Health and Safety Plan.

The construction methods, health and safety procedures, and disposal methods would conform to the regulations of federal, state, and local regulatory agencies. All required notifications would be made to the Ventura County Air Pollution Control District and California Division of Occupational Safety and Health. A contractor certified by the Contractors State License Board and registered with the California Division of Occupational Safety and Health would perform any required abatement work.

Biological Resources

Measure 5. To promote passive recruitment of desired vegetation by treating noxious weeds a Five Year Maintenance and Monitoring Plan would be implemented during which weed removal would be accomplished as needed.

Measure 6. To minimize potential for unnecessary discharge of sediments and weeds into wetlands, the project would use a variety of sediment stabilization and disturbance minimization methods. Those methods would include the use of: weed-free wattles at the project site perimeter and placed as close to the work site as possible; sand bags, tightly butted in a row; silt screens placed as close to the work as possible if there is insufficient space between the project and jurisdictional wetlands; rubber-wheeled vehicles for work in jurisdictional wetlands (tracked vehicles or other types of vehicles that kick-up sediments will not be allowed); equipment ensured to be clean and free of weed species and mud before entering the jurisdictional wetlands; and matting, boards, or other plate-like structures placed in the pathway of vehicles to minimize soil damage. To minimize potential for unnecessary disturbance of wetland habitat any and all heavy equipment will be required to be supported on stable ground or some other fabricated/interim means so as to prevent that equipment from sinking into soft wetland areas.

Measure 7. To avoid impacts to migratory and resident birds the project would occur outside of the migratory/resident bird nesting season (March 1-Sept 31).

Cultural Resources

Measure 8. To avoid any impacts to historic properties any ground disturbing project activities will be monitored by a qualified archaeologist.

2.4 Monitoring for Restoration Effectiveness

Wetland monitoring would be performed for five years to determine whether the project's goals and objectives have been achieved, and whether corrective actions are required to meet the goals and objectives. The monitoring would adhere to NBVC Wetland Restoration & Monitoring Program protocol, including:

1. Conducting a baseline California Rapid Assessment Method for Wetlands (CRAM) assessment to

establish the varying wetland functions at each site before restoration begins on both the proposed restoration site and a reference site. The assessment consists of four main attribute scores (Buffer and Landscape Context, Hydrology, Physical Structure, and Biotic Structure) which are further divided into different metrics (a measurable component of an attribute).

2. Monitoring various wetland functions (BMI, fish, plants, wildlife, and soils) begins one year post-restoration and would be conducted annually for five years. Monitoring data collected from reference sites is used to evaluate whether the restoration is progressing toward providing wetland functions at or near the level of the reference site. The NBVC Wetland Program has established U.S. Army Corps of Engineers-approved protocol for monitoring wetland restoration projects. As listed in Table 2-1 of the DARP/EA, the assessment will consist of four main attributes (Buffer and Landscape Context, Hydrology, Physical Structure, and Biotic Structure) which will be further divided into different metrics (a measurable component of an attribute).
3. Preparing a site-specific work plan to include specific measurable targets associated with each objective based on the most appropriate reference site and time period in question to provide a means of monitoring success or shortcomings of restoration activities and facilitate adaptive management. The restoration success criteria will be evaluated during the 5-year wetland restoration monitoring period on an iterative basis. The scope of implementation, monitoring, and adaptive management incorporates corrective action by the responsible implementing contractor in the event of any success criteria falling short of their target.
4. Install measurement devices in order to monitor marsh elevation change and accretion to inform sea-level rise vulnerability, adaptive management and intervention actions for existing marshes and efforts for their restoration. Monitoring for elevation change will assist in determining the success of whether the Trustees have achieved a self-sustaining wetland or whether sea level rise impacts the project's success. It may also assist with any adaptive management decisions related to the project based upon the monitoring data. It's critical to ensure project success, considering the projects do not reach full compensation for the injuries.

Tidal marshes are a critical part of the Naval Base Ventura County and provide habitat for endangered species, carbon sequestration, and flood protection (Takekawa et al 2011; Barbier et al 2011; Nahlik and Fennessy 2016). Existing tidal marshes are threatened by accelerating sea-level rise and there is great uncertainty about changes in sediment availability, accretion rates and overall marsh response. Marsh elevation building processes (i.e. accretion) are driven locally by a combination of mineral deposition from tidal flooding and organic production of plants (Morris et al. 2002). If sea levels rise too quickly, marshes may not be able to build elevations at a rate that outpaces sea-level rise; these areas will transition to unvegetated mudflats or subtidal areas. Local processes, such as wind-wave resuspension (Lacy et al 2018; Swales et al. 2019), stream and river flow, and periodic storm events (Feher et al. 2019; Thorne et al 2022), can influence local accretion rates within marshes and across the estuary. It is greatly uncertain if marshes will survive the coming decades and century with climate change and sea-level rise. Marsh field measurements can provide an early indicator for detecting change that can inform management intervention.

The deep rod Surface Elevation Table-Marker Horizon (rSET-MH) method is a nondestructive, standardized monitoring approach to determine mm-scale changes in marsh elevation (Figure 2-3). When the rSET reader is attached to a bench rod, it provides a constant reference plane in space from which the distance to the sediment surface can be measured (figure 2-4). Repeated measurements of elevation can be made with high precision because the spatial orientation of

the rSET reader remains constant for each sampling periods and is relative to a fixed subsurface datum (NAVD88). Marker Horizons (MH) are used in conjunction with the rSET to measure surface deposition (figure 2-4). rSET-MH data is paired with local water level monitoring at the marsh sites to develop important relationships between tidal and storm flooding, and sediment availability. These relationships can be linked to bay-wide turbidity measurements. These data are particularly relevant in the context of ongoing management actions (e.g., restoration, dredging) and accelerating sea-level rise and will provide valuable insights into the processes that govern marsh evolution and persistence within a changing climate.

The SET devices are a portable mechanical leveling device to measure relative elevation change. Deep rod SETs are attached to a deep benchmark that is driven into the ground using permanent steel rods until it is stable. This creates a constant reference plane from which the distance to the sediment surface can be measured by lowering pins (see Fig 2-3 & 2-4). Elevation change measured by the SET is influenced by surface and subsurface processes. Marker horizons (MH) are used in conjunction with the SET to measure surface deposition. The MH would be deployed with feldspar clay to be easily distinguishable from marsh soils and is non-toxic. The proposed action is to deploy the SET and MH devices and measure marsh elevation and accretion quarterly for the first two years and then twice per year for three additional years.

Details concerning the above monitoring would be incorporated into the design plan and approved by the Trustees prior to implementation of the project. The monitoring details would be available for review in the Administrative Record, and would continue until monitoring requirements are completed.

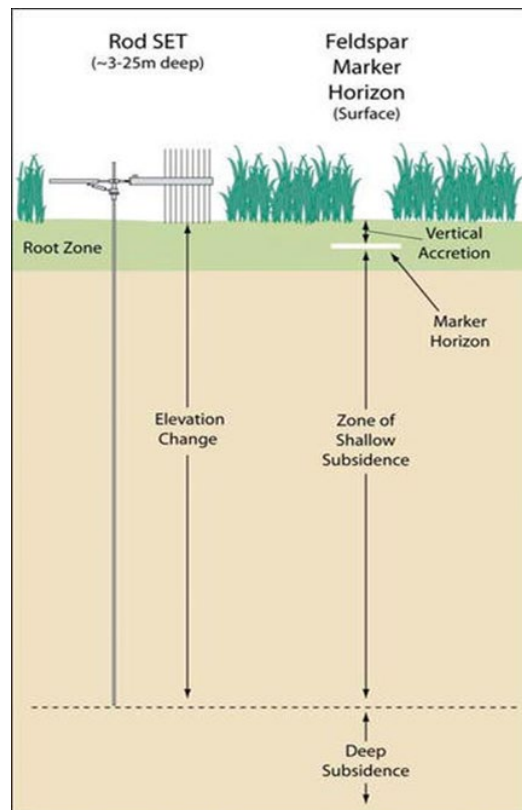


Figure 2-4. Schematic of the method of deep rod Surface Elevation Tables and Marker Horizons (rSET-MH) to monitor above and below ground marsh elevation building processes, from Cahoon et al. 2006.



Figure 2-5. Marker horizons can be used to measure the amount of deposition that occurs in a marsh (left). The arm reader for a Surface Elevation Table (SET) can provide mm measurements of elevation change (right).

3.1 Supplemental OPA Evaluation

Under 15 CFR 990.54, Trustees are to evaluate the proposed alternatives on, at minimum: (1) the cost to carry out the alternative; (2) the extent to which each alternative is expected to meet the Trustee's goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses; (3) the likelihood of success of each alternative; (4) the extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative; (5) the extent to which each alternative benefits more than one natural resource and/or service; and (6) the effect of each alternative on public health and safety. The proposed restoration projects still meet and were selected after balancing the evaluation criteria established for OPA and are described in the following sections.

1) The cost to implement the alternative. Given that the proposed projects are relatively small, and together do not fully compensate for the incident, the Trustees have determined that the proposed projects constitute a single alternative and thus, there will be no comparison between alternatives. The cost to implement the new restoration projects would be approximately \$1,011,692.86. This is within 10 percent of Alternatives 1 and 2 in the DARP/EA, after adjusting the 2016 costs into 2023 dollars. Under the assumption that marsh elevation monitoring (described in 2.4.4) and any associated stewardship would account for remaining uncompensated injury (i.e., 2.1 dSAY under the fire only scenario or 7.1 dSAY under the full incident scenario), this monitoring action would be cheaper per restoration credit than any of the three primary projects. All work would be awarded in compliance with laws and regulations that apply to Navy managed projects at NBVC.

2) The extent to which the alternative is expected to meet the Trustee's goals and objectives in compensating for interim losses identified in the DARP/EA.

Nexus to Injury. The more upland habitat revegetation is directly adjacent to the injured areas. It is a transition area that buffers wetland that was impacted by the spill, and it is expected to be a location where wetland resources can retreat as the sea level rises. The debris removal activities are farther away from locations impacted by the incident. However, the nexus to injury is direct due to the current lack of wetland functioning and expected recovery in areas impacted by the debris. The LIDU eradication benefits a combination of more upland and lower elevation marsh.

Benefits to injured resources. The benefits to injured resources looks at the ecological services involved in recovery such as primary production, soil development and biogeochemical cycling, invertebrate food supply and secondary production. The debris removal activities would provide an immediate benefit to injured resources by restoring hydraulic function and tidal influence to those discrete areas covered by the debris. The more upland habitat revegetation provides a less immediate benefit to tidally inundated wetlands resources than what is expected from debris removal activities; however, the more upland restoration does meet the goal of increasing native plant cover and habitat for native fauna. The LIDU eradication facilitates the reestablishment of native marsh plants and habitat, which benefits native fauna (e.g., pollinators, small mammals, birds).

3) The likelihood of success for the alternative. The debris removal, habitat revegetation, and exotic species eradication projects have a high likelihood of success. They are relatively small in scope and important to keeping the marsh ecosystem thriving. The Navy has conducted similar habitat restoration efforts around the marsh and on the installation as part of its day-to-day natural resources management responsibilities on base with great success.

4) The extent to which the alternative would prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative. The proposed projects are not expected to play a role in preventing future injury from the plane crash incident. The DARP/EA indicated that natural resources had recovered and in fact the purpose of the DARP/EA was to provide compensatory restoration for losses that occurred from the incident in 2011. Implementation of the proposed projects are not expected to cause any net collateral damage to the environment. Proposed locations for deployment of monitoring equipment and debris removal activities will be conducted in a manner to avoid impacts to existing environmental resources to the maximum extent practical.

5) The extent to which the project benefits more than one natural resource and/or service. The primary NRDA benefit of the restoration projects would be to restore marsh habitat. Benefits would also be provided through enhanced locations for sensitive species recovery.

6) The effect of the restoration project on public health and safety. Adverse impacts on public health and safety are not expected from the restoration activities. No changes to access or use of Mugu lagoon are anticipated. It is anticipated that debris removal would improve tidal flow and reduce potential contaminants and hazards from the intertidal zone.

Summary

Because of the Omega crash, the habitat within Mugu lagoon was damaged and in certain areas, completely lost. The proposed restoration project would improve habitat that has recovered over the intervening years and expand native habitats within the marsh system. The proposed restoration projects are technically feasible and use proven techniques with established methods and documented results. Sediment load monitoring could lead to better marsh stewardship and is a cost-effective action under the assumption that it would account for any remaining uncompensated marsh injury after performing

the three proposed restoration projects. Further the proposed projects can be implemented with minimal delay pending completion of listed species surveys and, if required, any ESA-listed species consultation. An environmental review indicates the adverse impacts resulting from the proposed projects would be minor, localized, and short-term. In addition, BMPs and measures to avoid or minimize adverse impacts described in Section 4 of this Supplemental RP/EA would be implemented. As a result, collateral injury would be avoided and minimized during project implementation.

4.1 Supplemental Environmental Impact Analysis

The new restoration projects proposed in this SRP/MFR are in the same general, albeit much larger, area of Mugu lagoon than those analyzed in the DARP/EA. Therefore, the affected environment will largely remain the same as originally presented in Chapter 3 of the DARP/EA, thus the information is incorporated by reference. One element of the proposed upland habitat revegetation project is similar in scope to two alternatives considered but not carried forward for detailed analysis (see 2.4.6 Invasive Non-Native Plant Removal Alternative and a portion of 2.4.7 Central Basin Non-Native Plant Removal Alternative in the DARP/EA on p. 2-9). The following subsections describe any differences in the affected environment and the environmental consequences of the proposed restoration projects.

In the DARP/EA, due to the specific effects potentially arising from the construction of project alternatives, several resources were not analyzed in detail such as geological resources, coastal resources and land use, hazardous and toxic materials and waste/protection of children, noise, visual, utilities and infrastructure, transportation, recreation, socioeconomics, environmental justice, air quality/climate change. For those resource areas, a description of the minimal effects and conclusions of insignificance were provided. The resources evaluated in more detail were: water, cultural and biological.

Because the proposed restoration projects in this SRP/MFR were not previously evaluated, a review of each resource topic is needed for the impact analysis. All potentially relevant environmental resource areas were considered for analysis in this SRP/MFR however, some resources are understood to have negligible or non-existent potential for significant impacts under the proposed restoration projects and they are not analyzed in detail in this SRP/MFR for the reasons described below. Additionally, the No Action alternative is not evaluated herein since no change in impacts would occur for the No Action as described in the DARP/EA.

Geological Resources: The geological resources described in the DARP/EA remain the same. The debris removal project may cause superficial soil disturbances during the removal activities, especially if some items are partially buried under silt or sedimentation. The upland habitat revegetation project may also cause superficial soil disturbances during the non-native species removal activities, during the planting native species, and from installation of the sediment monitoring devices. However, there are no significant changes to terrain proposed and all disturbances are minor, temporary, and not expected to be significant. Therefore, the proposed restoration projects have no potential to cause significant impacts to geology and topography.

Coastal Resources and Land Use: The coastal resources and land use described in the DARP/EA remain the same. As mentioned above, the Trustees determined the preferred restoration project alternative described in the previously final DARP/EA would have no effects to coastal resources or uses and the California Coastal Commission concurred with that determination ND-0039-15 on 4 January 2016 (see ND-0039-15). The new restoration projects would occur on federal land and thus, by definition outlined in

CZMA, not within the coastal zone. The debris removal project may involve temporary access to areas subject to tidal flooding. Removal activity would occur at lowest tide to facilitate easier access and visibility of debris. Human and aircraft activity would pause for any marine mammals in the vicinity and wait until such animals have moved out of the area.

The upland buffer revegetation and LIDU eradication would occur in areas not subjected to regular tidal influence. The debris removal and placement of the sediment monitoring devices would occur within areas of tidal influence but would be much smaller and less impactful than the previous projects analyzed in the DARP/EA and would be timed to occur during low tide to avoid water contact and impacts to water quality. In addition, the proposed restoration projects would be of limited duration and thus would not cause any reasonably foreseeable significant direct or indirect effects on coastal uses and resources. No changes to land use would occur as a result of either restoration project. The existing military land use in the project area would continue to support naval operations and no land use compatibility issues would occur. The proposed restoration projects have no potential to cause negative impacts to coastal resources and land use. The Trustees have determined the restoration projects have no effect to coastal uses or resources of the coastal zone and no further documentation is required.

Hazardous and Toxic Materials and Waste/Protection of Children: The hazardous materials and waste information provided in the DARP/EA remains the same. Both proposed restoration activities of the SRP/MFR would be conducted by contractors and would be required to abide by the environmental protection measures outlined in Section 2.3 above. Implementation of a hazardous materials/hazardous waste management plan and a health and safety plan and an accident prevention plan prior to the start of activities would ensure effects to hazardous materials and wastes would be minimized or avoided all together. Under the above described conditions, and considering the fact that there would be no change in the quantity or types of hazardous materials used in the project areas, no significant impacts associated with hazardous materials would result from the restoration activities. With proper hazardous material use and storage, no increase in human health risk or environmental exposure to hazardous materials would result from implementation of the restoration activities.

Since the proposed restoration activities do not involve substantial earth moving, no impacts to historic waste sites is expected. Therefore, adverse impacts to natural resources are considered unlikely for the proposed restoration activities since there will be no change to land use and wetlands habitat is expected to be enhanced along with increased wildlife utilization.

Access to areas where debris removal and upland habitat revegetation activities are planned would be restricted, which would minimize environmental health risks or safety risks to children. There is no appreciable likelihood of persons living or working on or in proximity to NBVC Point Mugu being exposed to risk from accidental explosions and no adverse effects from groundwater contamination are expected to occur. Therefore, the proposed restoration activities would have no significant potential to cause significant impacts to public, military health and safety, or children.

Noise: The noise environment described in the DARP/EA remains substantially the same with aircraft operations providing the most significant noise source in the proposed restoration areas. NBVC Point Mugu airfield has had an increase in aircraft and personnel since the relocation of the U.S. Coast Guard station from Los Angeles to Point Mugu. The only noise producing activity proposed in the restoration projects is the potential use of helicopters and mechanized equipment (such as front loaders) to pick up certain large size debris. Due to the location of the debris, removal activities would have seasonal restrictions to avoid impacts to nesting bird species. The noise associated with the removal activities would result in increased noise levels within the immediate area. However, noise level increases would

be temporary, de minimus in volume, and no higher than nearby noise levels generated by other air operations at NBVC Point Mugu. Once removal activities are complete the site will return to its previous ambient noise levels generated by road traffic and, more significantly, military airfield operations. Wildlife are generally expected to return to the site. The equipment operation hours would be limited to normal working hours: between the hours of 7:00 AM and 5:00 PM weekdays and Saturdays, excluding holidays. No holiday or nighttime operation of construction equipment would be permitted. There would be no permanent adverse indirect effect to the project vicinity, the nearest sensitive receptors, or to the installation over all. Therefore, the Proposed Action has no potential to cause significant impacts due to noise.

Visual Resources: The visual resources have not appreciably changed from the DARP/EA. Similarly, the proposed restoration activities are not expected to provide any changes to existing viewsheds at NBVC Point Mugu. There would be a temporary visual impact during debris removal activities from the use of helicopters and equipment as well as the stockpiling of debris for waste collection and pick-up. Personnel involved in the habitat revegetation activities would be limited and infrequent. After completion of the restoration projects, views in the project area would remain as they are and continue to be consistent with the area's appearance, which is coastal and military in appearance. The projects are expected to result in the long-term enhancement of area aesthetics by attracting and supporting wildlife and botanic resources to the project site. Therefore, the Proposed Action has no potential to cause impacts to aesthetic or visual resources.

Utilities and Infrastructure: The utilities and infrastructure have not appreciably changed from the DARP/EA. Any usage of electricity, natural gas, communication infrastructure, water, sanitary sewer, and solid waste disposal resulting from the Proposed Action would be accommodated by existing supplies and capacities and/or planned upgrades. The Proposed Action would involve debris removal, revegetating with native species and eradication of LIDU so new public services or utility connections would be required as a part of the project. Therefore, the Proposed Action has no potential to cause significant impacts to utilities and infrastructure.

Transportation: The transportation resources and environment has not changed since the DARP/EA. The restoration projects would occur on Navy land where access is controlled. The debris removal project may involve use of a helicopter which would be coordinated with the airfield and current military operations to minimize impacts. All other activities associated with the proposed restoration projects are not expected to impact traffic on the installation or require any road closures during project implementation. Access to the sites would be along existing paved or dirt paths and no new transportation routes would be required. Therefore, the Proposed Action has no potential to cause significant transportation impacts.

Recreation: The recreational opportunities and access to them has not changed since the DARP/EA. NBVC Point Mugu continues to provide several recreational activities for the benefit of military and civilian personnel. Public access is restricted for most of the base, even for installation personnel, because of mission activities and sensitive natural resources. Areas near the restoration sites are open to base personnel for outdoor recreation activities include hunting, fishing, wildlife viewing, camping, picnicking, and limited recreational use of beaches. The most heavily used recreation area at NBVC Point Mugu is Family Beach, adjacent to the mouth of Mugu Lagoon. There is no road closures anticipated for duration of restoration activities. There is an expectation that implementation of the Proposed Action would improve wetland and marsh habitat values which may improve wildlife utilization of the area over the long term. Recreational opportunities such as increasing wildlife viewing would improve as, wildlife and wildlife habitat increase. Therefore, the Proposed Action has no potential to cause significant impacts on recreation in the area.

Socioeconomics: Existing military land use in the project area would continue to support naval operations and there would be no significant changes to the existing socioeconomic environment (e.g., existing levels of human population or use or economic activity) as a result of the project. Additionally, there are no schools or public housing near the project area that could be affected by the project. Therefore, the Proposed Action has no potential to cause significant socioeconomic impacts.

Environmental Justice: Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations* requires that “each Federal Agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health effects on its programs, policies, and activities on minority populations and low income populations” (59 Federal Register 1994). The project would not substantially affect human health or the environment. The project would take place within the NBVC Point Mugu property boundaries. Therefore, the project would not disproportionately increase environmental or health impacts on low-income or minority populations. The Proposed Action has no potential to cause significant EO 12898 impacts.

Air Quality/Climate Change: In general, the air resources have not changed since the DARP/EA. The proposed restoration projects are within the South Central Coast Air Basin, which consists of the San Luis Obispo County, Santa Barbara County, and Ventura County Air Pollution Control Districts. The following list presents the heavy equipment and the total estimated hours that each would be used over the approximately 8-week duration of the project:

Front End Loader – to be used for a total of approximately 16 hours

Truck – to be used for a total of approximately 40 hours

Helicopter – To be used for a total of approximately 8 hours

Hydraulic Crane – to be used for a total of approximately 8 hours

The short duration and limited scope of this project is such that it has no potential to exceed the air basin’s conformity de minimus levels and therefore have no potential to significantly impact air quality. The Navy has concluded that further formal conformity determination procedures regarding air quality are not required. Based on a reasonable assumption and the type as well as duration of the equipment that will be used, this action not cumulatively or individually meet or exceed the Environmental Protection Agency Mandatory Reporting emissions threshold of 25,000 metric tons of CO₂ per year.

Water Resources: In general, the water resources are the same as described in the resource setting of Section 3.1 of the DARP/EA. The debris removal activities may affect surface waters but the effect would be temporary during the removal and then beneficial, due to free flow of those waters and reduced potential for pollutants, once the debris is removed. The debris removal activities would have no effect on flood hazards other than reducing the spread of man-made debris into the coastal waters and would have beneficial effects to water quality. Additionally, there would be no change to ground water supply resulting from the debris removal activities.

Habitat revegetation activities would not have an impact on surface waters, flood hazards, or have the potential to effect water quality or ground water supply. Eradication of invasive species and planting of native species may have minor beneficial impacts to the health of the marsh.

Therefore, the proposed restoration projects have no significant impacts to surface water hydrology or water quality; no potential to cause flooding; no significant impacts to groundwater hydrology, groundwater quality or water supply.

Cultural Resources: In general, the cultural resources are the same as described in the resource setting of Section 3.2 of the DARP/EA. As discussed above, the NHPA Section 106 process for the preferred alternative identified in the DARP/EA was completed upon receipt of a concurrence from the California State Historic Preservation Office on 23 October 2015. The determination was “no affect to historic properties.” The debris removal, habitat revegetation and LIDU eradication activities of this SRP/MFR are considered the proposed undertaking for purposes of analyzing the projects under NHPA’s Section 106 process.

The area of potential effect (APE) for the debris removal activities is a number of discreet areas where target debris items have been located within the Central basin of Mugu Lagoon. The APE for the habitat revegetation activities is the buffer area between North and South pond. And the LIDU eradication APE is in discreet locations where the invasive plant species is found within the marsh complex. None of the known historic properties eligible for listing on the National Register of Historic Properties and located on NBVC Point Mugu are found within any of defined APEs. The proposed undertaking is the type of activity that doesn’t have potential to affect historic properties, assuming they were present. There is a lack of archeological and historic resources present in Mugu Lagoon complex. Therefore, the project meets the standard for a finding of no historic properties affected, consistent with 36 CFR 800.4(d)(1). Because the restoration projects are less impactful and invasive than those originally consulted on, the Trustees have determined that no additional concurrence with SHPO is required. Therefore, the restoration projects would not result in significant impacts to historic resources.

Biological Resources: In general, the biological resources are the same as described in the resource setting of Section 3.3 of the DARP/EA. The proposed restoration projects would occur within the estuarine coastal salt marsh that provides food, nesting, sheltering, breeding and nursery grounds for numerous species of fish, wildlife and plants. The wetlands provide a variety of habitat functions and restoring functionality would achieve the goals for compensatory mitigation.

The debris removal activities would occur primarily in the Central Basin area of Mugu Lagoon. According to the INRMP 2013, the area is considered jurisdictional wetlands by the USACE and essential fish habitat and habitat of particular concern by NMFS. The area is south of tidewater goby occupied habitat. Some of the known debris identified for removal appears to be located adjacent to federally listed species nesting habitat, specifically western snowy plover and light footed Ridgway’s rail. The proposed area does not appear to contain salt marsh bird’s beak habitat. Impacts to biological resources are expected from the use of vehicles and personnel to physically remove the debris which may trample groundcover or benthic species and startle birds and small animals or fish, depending on the location of the debris. However, the impact would be temporary and minimal and is expected to improve the area once the debris is removed. As discussed above, the debris removal activities would be limited to avoid nesting season to minimize any effects to listed species that may be potentially in the area.

The habitat revegetation activity would primarily occur adjacent to North pond, where the crash occurred adjacent to the runway. According to the INRMP 2013, the general area is considered jurisdictional wetlands by the USACE and essential fish habitat and habitat of particular concern by NMFS, though the specific site is an upland area. The area does appear to be located near federally listed species nesting habitat, specifically Ridgway’s rail and atypical western snowy plover; however, it does not appear to contain salt marsh bird’s beak habitat. The other general areas for proposed LIDU eradication occurs in the same vicinity as the debris removal activities of the Central Basin. Impacts to biological resources are expected from personnel physically removing invasive species and then planting native species. The impacts would be temporary and not significant.

As stated previously, site specific habitat and species surveys would be conducted prior to field activities to identify the need for a Clean Water Act Section 404 and 401 permit and/or any Endangered Species Act Section 7 consultations. Section 7 consultation is not expected since the sites are not known to currently support any listed species.

These restoration activities are anticipated to provide overall enhancement of wetlands habitat by enabling re-establishment of wetland vegetation thus benefitting benthic invertebrate diversity in the areas covered by debris and benefitting habitat diversity in the areas being restored.

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APPENDIX A

ALTERNATIVE EQUIVALENCY ANALYSIS

Alternative Equivalency Analysis for Omega Aerial Refueling Services Flight 70 Crash on May 18, 2011 at Naval Base Ventura County: Considering Alternative Jurisdictional Definitions and Restoration Projects (Rev 5/25/23)

Executive Summary

Two circumstances merit the re-examination of the original equivalency analysis conducted for the Omega Aerial Refueling Services Flight 70 Crash (the “incident”) at Naval Base Ventura County (NBVC)¹. First, the National Pollution Fund Center (NPFC) has communicated an interest in separating the fuel oil and spill-response impacts from other crash-related resource injuries in the impact Zone 1b. This is the zone where the Trustees have quantified the largest injury in discounted service acre-years (dSAY). Second, the two restoration projects examined in the original equivalency calculations are no longer available for implementation, as the projects are to be incorporated into a mitigation bank that compensates for NBVC development and operations.

This document describes calculations that re-examine the alternative injury scenario requested by the NPFC and considers three new restoration projects. We find that:

- An alternative “fuel only” injury scenario for Zone 1b reduces the quantified injury for that zone by 41%. This reduces total injury quantification across all zones from 18.4 dSAY in the original equivalency analysis to 13.4 dSAY.
- A debris removal project on Navy wetland property would provide significant in-kind benefits per unit area (15 dSAY/acre) under aggressive wetland recovery assumptions. However, the project debris is only identified over a relatively small area (0.024 acre). The total quantified equivalency credit is 0.36 dSAY.
- An upland wetland buffer revegetation project that provides largely out-of-kind benefits in the near term can be credited against a portion of the spill injury. If it is treated as in-kind, 6.00 dSAY in benefits would be credited against the spill injury.
- A European sea lavender eradication project would potentially provide 3.67 dSAY in benefit.
- A suite of restoration projects that combines the debris removal project, the upland wetland buffer revegetation project, and the European sea lavender eradication project, would not fully compensate for the 13.4 dSAY injury identified in the minimal “fuel only” scenario. This occurs even when (1) treating the upland revegetation project as being fully in-kind, and (2) including additional hypothetical benefits to debris removal.
- There may be strategies for expanding the debris removal project to increase project benefits.

The primary implication of our findings is that the debris removal project, the revegetation project, and the European sea lavender eradication project can all be justified as providing partial credit for the spill. Further, the calculations imply that there is room for more debris removal to be added as spill

¹ Point Mugu NRDA Trustees, Natural Resources Data Summary and Habitat Equivalency Analysis Calculations for Omega Aerial Refueling Services Flight 70 Crash on May 18, 2011 at Naval Base Ventura County. Administrative Record Document 20160100.

compensation (if additional debris can be found), additional revegetation of upland wetland buffers, additional European sea lavender eradication, or possibly other restoration actions. However, the practicality of identifying additional in-kind wetland resource projects on an active military base that utilizes available wetland enhancements to support its national security functions is uncertain and not evaluated in this analysis.

Isolating the Impacts of Fuel in Zone 1b for Restoration Scaling

The NPFC has communicated an interest in separating the non-fire-related oil and spill-response impacts in Zone 1b from other resource injuries that were associated with the aircraft crash. For the purpose of this document, we will refer to this as a “fuel only” impact, which captures the impact of both the oil discharge and response activities to address that discharge. Quantifying this impact is complicated because Zone 1b was subject to a range of crash-related impacts, and there is no perfect data source or method for precisely disentangling the different dimensions of the crash-related harm to natural resources. This document uses estimates of marsh elevations and the associated calculations of the area inundated by marsh waters as the mechanism for identifying where marsh resources were most directly in the pathway of the fuel, and therefore subject to fuel- and spill response-related injury. This captures “fuel-only” marsh injury, as compared to marsh injury occurring from both fuel and fire.

Thousands of gallons of fuel (Jet Propulsion Fuel 8 [JP-8]) were spilled in the crash. This is a significant volume of oil discharged in a rather small area. Fuel discharged from the aircraft entered the marsh and was transported throughout Zone 1b and toward Mugu Lagoon by the movement of marsh waters. As part of spill response, natural tidal flow was restricted to reduce the transport of fuel outside of Zone 1b. While reducing the transport of oil likely reduced spill-related impacts in Zones 2 through 4 and adjacent ocean waters, the muted tidal flows are also expected to have resulted in elevated water temperatures, reduced dissolved oxygen, and resulting harm to aquatic life in Zone 1b that may have survived the initial oil impacts.

The Trustees do not believe the impacts of the fuel and fuel-specific spill-response were necessarily limited to inundated areas. However, the Trustees do not have the information to separate fuel oil and response impacts from other incident impacts in the more upland marsh areas. For example, it is unclear how much fuel travelled over non-wetted portions of the marsh before reaching marsh waters. Similarly, it is unclear to what extent firefighting activities may have transported oil to higher marsh elevations. Further, it is not known how much of the fire impacts in upland areas were the result of burning fuel versus other burning materials. What is known is that containment boom remained onsite until soil remediation was complete, suggesting that response to the threat of the transport of discharged oil continued for months after the fire subsided.

By focusing on areas inundated by marsh waters, the Trustees are subtracting out all the higher elevation areas that were impacted by the oil spill and response actions but also subject to fire, trampling, aircraft removal operations, and the physical trenching created by the movement of the aircraft through the marsh. Of the 8.38 acres in Zone 1b (included in the Trustees initial claim submission), 4.96 acres (59.3%) were expected to be inundated at 6.2ft MLLW, which is the high tide height following the crash (see Figure

11, below, numbered and reproduced from Administrative Record Document 20160100).² These baseline elevation data do not include marsh trenching caused by the crash, which further expanded inundated areas exposed to oil.

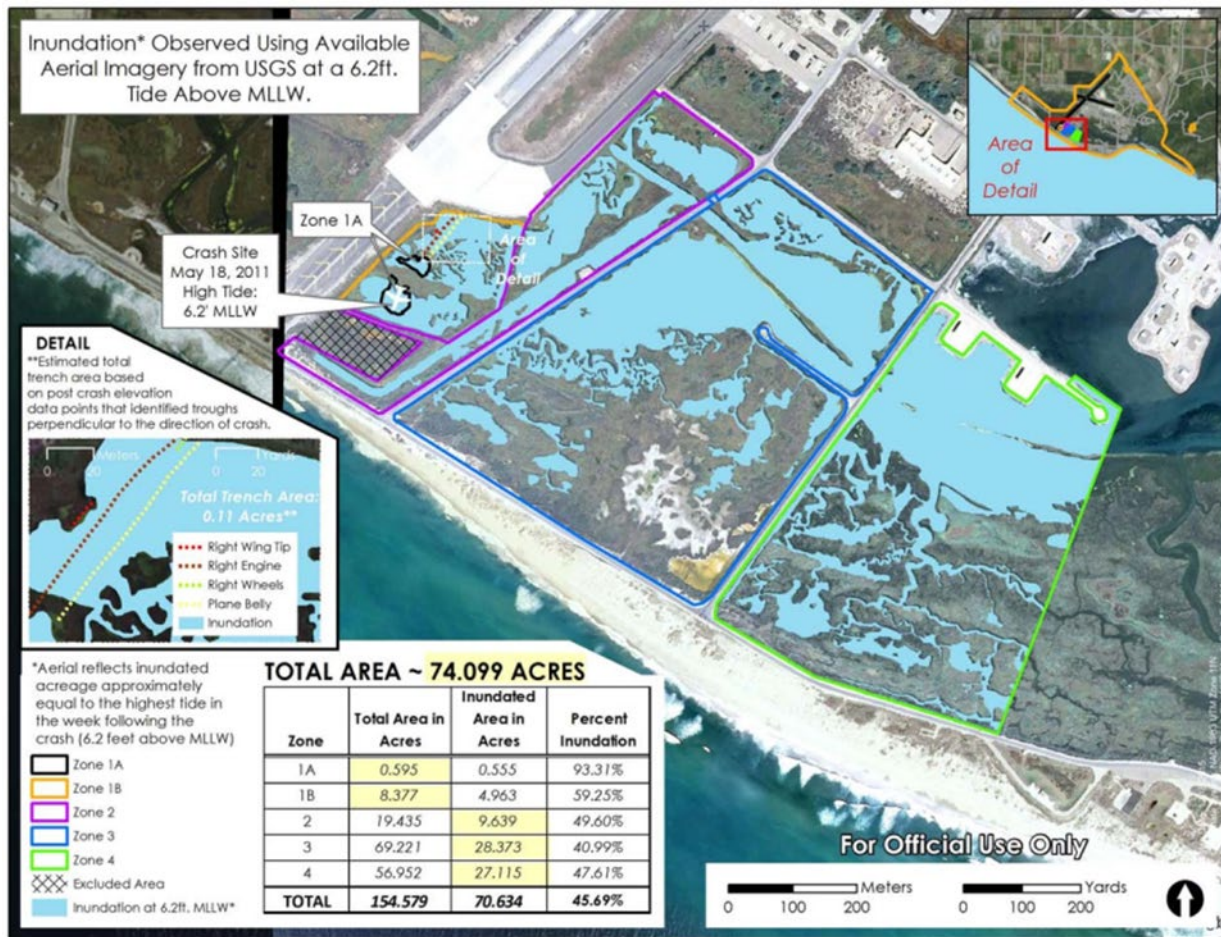


Figure 11: Impact Zone Acreages, Based On Type of Impacts and Tidal Levels at Time of Crash

To isolate oil impacts in Zone 1b injury quantification, the Trustees use the recovery trajectory presented in the Trustees’ initial claim submission but then apply it only to the Zone 1b inundated acreage (4.96 acres discussed above, instead of all 8.38 acres of Zone 1b). The more upland areas in Zone 1b are excluded from this calculation. This approach is further based on three general lines of reasoning.

First, the release of thousands of gallons of jet fuel into a relatively slow flowing, shallow marsh habitat is expected to have resulted in high levels of injury, regardless of whether there was a coincident crash of an aircraft. In fact, limiting the application of the Zone 1b-wide injury estimate from the initial claim submission to only the inundated areas in Zone 1b may underestimate the “wetted area injury” associated

² Point Mugu NRDA Trustees, Natural Resources Data Summary and Habitat Equivalency Analysis Calculations for Omega Aerial Refueling Services Flight 70 Crash on May 18, 2011 at Naval Base Ventura County. Administrative Record Document 20160100. Figure 11

with an oil release. The removal of unwetted areas (the more upland areas) from the calculations means that the injury estimate per acre should be based only on the 4.97 inundated acres within Zone 1b, as the 3.42 upland acres of Zone 1b are now excluded entirely from the analysis. For this reason, the estimate in Zone 1b is a conservative underestimate because it excludes unwetted areas of oil-based injury and/or response-caused injury that cannot be decoupled from injuries coextensive with fire or injuries from activities less directly related to response. Consequently, the “fuel-only” injury estimate for Zone 1b, based solely on Zone 1b’s inundated area (4.97 acres), would no longer have to account for or factor in lower degrees of impacts expected in some of the more upland locations (now excluded from the calculations) that were more spatially removed from the spill pathway and salvage actions.

Second, the general functional form (or shape) of the injury trajectory used by the Trustees for Zone 1b in the original equivalency analysis did not incorporate delays in recovery that would have been associated with response actions. Unlike Zone 1a where the recovery trajectory incorporated the timing of known delays associated with the excavation of contaminated soil, the quantification of injury for Zone 1b assumed that recovery began immediately after the initial impacts (see Figure 13, below, numbered and reproduced from Administrative Record Document 20160100).³ While the Trustees expected the recovery of Zone 1b to be delayed by removal actions, the timing of those delays was also expected to vary across the zone in a relatively complex way. Since (1) the Trustees did not have data to precisely determine the timing of those delays and how they varied across space, and (2) the delays were expected to operate on the order of months (versus years), the Trustees opted to avoid speculating on the nature and extent to which response actions and other non-oil related stressors delayed recovery and chose to be conservative (in favor of a lower injury estimate) by assuming no delays occurred. This is consistent with a scenario where the only impact in this zone is an oil release that resulted in harm to biota and vegetation, and where the product did not otherwise persist in the environment. In essence, the functional form of the Trustees’ original injury trajectory is already consistent with a “fuel-only” impact.

³ Point Mugu NRDA Trustees, Natural Resources Data Summary and Habitat Equivalency Analysis Calculations for Omega Aerial Refueling Services Flight 70 Crash on May 18, 2011 at Naval Base Ventura County. Administrative Record Document 20160100. Figure 13.

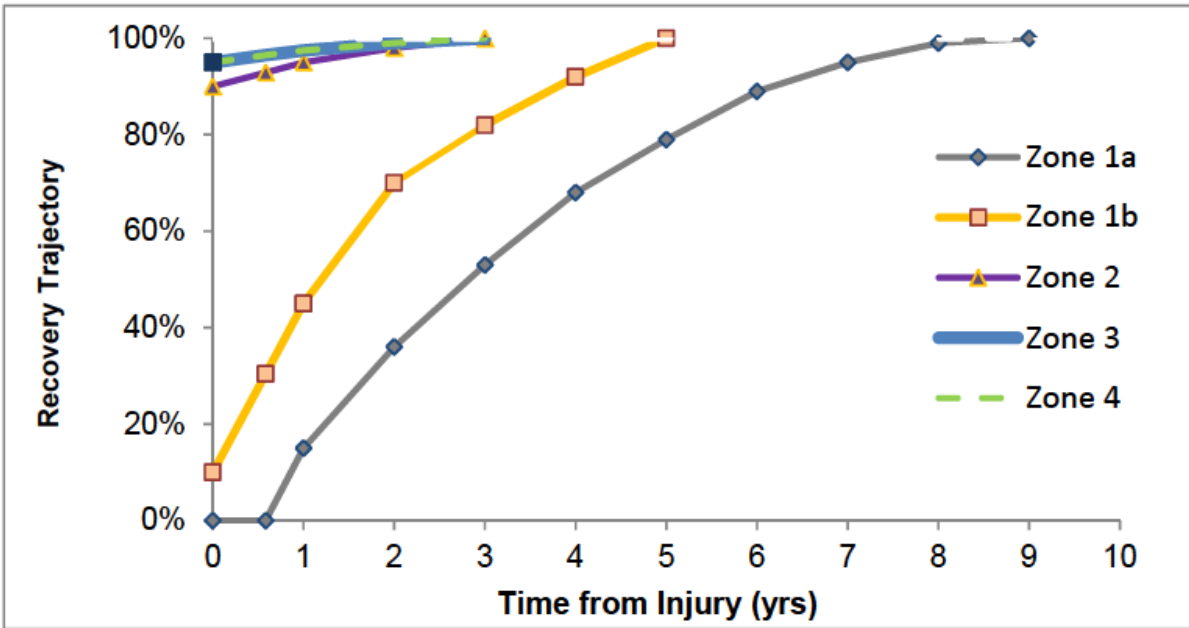


Figure 13: Recovery Trajectories (to baseline, pre-incident) Over Time by Zone

Third, the overall recovery time used in the Trustees’ original equivalency calculations for Zone 1b (5 years) was based on the life histories of organisms present in the zone and in the pathway of fuel. Basing recovery times on the life histories of organisms is a common practice in natural resource damage assessments for oil spills, and therefore, is still appropriate when limiting the focus of the equivalency analysis to impacts that were fuel-related. As a result, the Trustees continue to use the original estimate of recovery time when isolating the “fuel-only” impacts in this zone.

In sum, the discharge and movement of thousands of gallons of oil caused significant injuries to the inundated areas of the marsh. Further, the discharge would have caused a similar level of service loss to the inundated areas even without the flaming oil or “non-fuel” impacts such as the crash and aircraft removal. Focusing on wetted areas only in the injury quantification and using the original trajectory for Zone 1b is a reasonable calculation of resource loss for the spill-related impacts of the incident to Zone 1b had the other dimensions of the crash not occurred.

Results of Injury Quantification for the “Fuel-Only” Impact Scenario

The following table summarizes the results of injury quantification for the “fuel-only” scenario described above. These results are compared to the calculations in the initial claim that was submitted by the Trustees. The box around Zone 1b highlights how the scenario that focuses on oil and discharge-specific response pathways changes the injury calculations.

Table 1. Comparison of All Quantified Impacts and the "Fuel Only" Impact Scenario

	Area with All Impacts (acres)	Injury with All Impacts (dSAY)	Area in Fuel-only Scenario (acres)	Injury in Fuel-only Scenario (dSAY)
Zone 1a	0.60	1.77	0.60	1.77
Zone 1b	8.38	12.35	4.96	7.31
Zone 2	9.64	1.11	9.64	1.11
Zone 3	28.36	1.63	28.36	1.63
Zone 4	27.11	1.57	27.11	1.57
Injury (All Zones)	74.09	18.4	70.67	13.4

Injury in Zone 1b is reduced from 12.35 dSAY to 7.31 dSAY, a 41% reduction. The injury across all zones in the "fuel-only" scenario is 13.4 dSAY versus the 18.4 dSAY estimate that was calculated in the original claim submission. These are to be compensated for by restoration projections that provide in-kind resource benefits.

Restoration Overview

The Trustees' initial quantification of "all incident-related impacts" ⁴ and the reconsideration of "fuel only" impacts both identify resource injuries to be compensated through restoration actions. The Trustees considered two restoration projects in the DARP/EA to compensate for injuries associated with the incident. Since the DARP/EA was published, these projects have become infeasible because they are to be incorporated into a mitigation bank for the base. This section considers three new alternative projects that have been identified by the Navy.

New Project 1: Debris Removal

The Navy has identified a project to remove debris from a 245-acre wetland complex on Naval Base Ventura County (NBVC) property. On a 2022 site visit, 71 large debris items were identified and measured. These items included telephone poles, vehicle tires, appliances, plastic material, and other items. Much of this work to remove these items would occur in lower elevation areas that are periodically inundated by tidal flow.

⁴ Point Mugu NRDA Trustees, Natural Resources Data Summary and Habitat Equivalency Analysis Calculations for Omega Aerial Refueling Services Flight 70 Crash on May 18, 2011 at Naval Base Ventura County. Administrative Record Document 20160100.

This project is particularly attractive because it benefits lower elevation marsh that is functionally similar to the habitat included in the injury quantification for this spill. The project is also expected to provide biological benefits quickly, once implemented.

Marsh Benefits to Areas under the Footprint of Debris Items

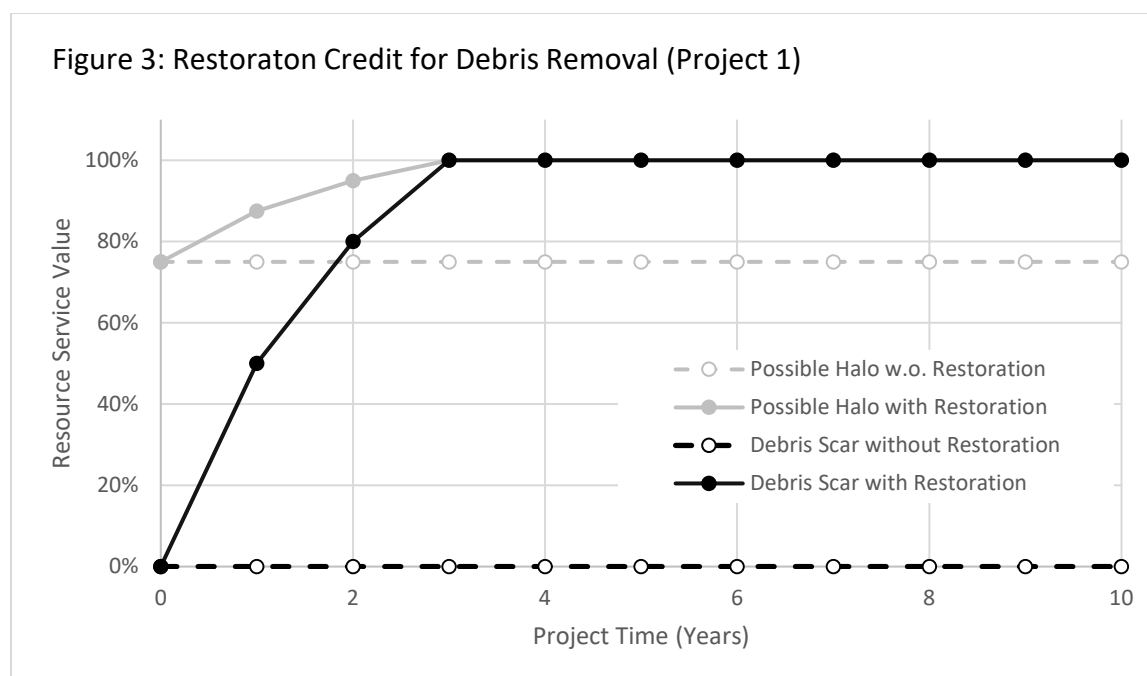
Based on the 2022 site visit, the Navy estimates that approximately 1,026 square feet (0.024 acre) of wetland is covered by debris items that can be targeted by the project.⁵ For the purpose of quantifying restoration benefits for removing this debris, we make the following assumptions (see Figure 3):

- Areas covered by debris provide zero wetland benefits absent debris removal.
- Once the debris is removed, the remaining scar will quickly re-establish with wetland vegetation, so that full project benefits are achieved within three years.
- No temporary harm to wetland habitat will occur as a result of implementing the project.
- The average maximum resource benefit after the debris is removed is 100% resource service value.
- The project will be implemented soon and begin providing resource benefits between May 2023 and May 2024.
- The effective project life is 40 years, given uncertainties in sea level rise and resulting habitat change.

The above assumptions are aggressive for quantifying the benefits of wetlands restoration, reflecting rapid recovery of wetland resources.⁶ This is partially justified by the small size of the typical scar and the resource quality of the surrounding marsh vegetation. However, calculations based on quick and uniform recovery of all debris scars, with no consideration of any risk that wetland resources will not establish in any scar location, also demonstrates the robustness of Trustees' quantification. Under the above assumptions, the 0.024-acre project provides 0.36 dSAY, or approximately 15 dSAY/acre. This is well below the injury quantified by the Trustees in either the initial claim (18.4 dSAY) or the more limited recalculation (13.4 dSAY).

⁵ See "Omega Mitigation GCE Narrative", transmitted via email 5 August 2022 by Jason Golumbfskie-Jones.

⁶ For example considerations, see: Strange, E, H Galbraith, S Bickel, D Mills, D Beltman, J Lipton. (2002) "Determining Ecological Equivalency in Service-to-Service Scaling of Salt Marsh Restoration" Environmental Management 29: 290-300.



Hypothetical Halo of Restoration Benefits so Marsh Surrounding Removed Debris

There is no clear visual evidence of systemic resource losses beyond the physical boundaries of the individual debris items. It is still plausible, however, that the debris negatively affects surrounding marsh habitat. To the extent that there is a “halo” of impacts to the marsh beyond the physical footprint of debris, removing this debris could benefit a larger marsh area.

To examine the practical implications of including a halo effect into the restoration benefit calculations, the Trustees use the following assumptions (see Figure 3):

- On average, the “halo affect” is approximately five times the size of the physical footprint of the debris items (e.g., 5,130 square feet or 0.12 acre).
- The resource service value of marsh habitat that falls within the immediate halo of the large debris items experiences a 25% reduction in resource value due to the debris
- The resource service value of the marsh habitat that falls within the “halo area” will fully recover to 100% service value along a similar trajectory as the debris scar.

Under these assumptions, the hypothetical halo effect would provide an additional 0.45 dSAY. This would increase the total project benefit to 0.82 dSAY for the 0.024 acre of debris removal. This is still well below the 18.4 and 13.4 dSAY injuries that the Trustees quantified in the fire and no-fire injury scenarios.

Possibility of Identifying Additional, Large Debris Items

Debris removal teams will spend concentrated amounts of time in the marsh removing debris. It is plausible that more debris items will be found during project implementation.

Since the benefits of the project are largely proportional to the footprint of the large debris items removed, increasing the area of debris items is expected to provide proportional increases in the

benefit of the project. For example, in the hypothetical scenario where there is a 500% halo of marsh around the 0.024 acre of debris), finding twice the amount of large and removable debris items will double the project benefits from 0.82 dSAY to 1.63 dSAY. This is still considerably lower than the 18.4 and 13.4 dSAY injury scenarios quantified by the Trustees.

New Project 2: Revegetation of Upland Wetland Buffer

The Navy has also identified a project to restore an upland wetland habitat buffer. The project site is approximately 40 feet by 550 feet (0.51 acre) and is immediately proximate to the spill.⁷ The project would involve treating existing iceplant with herbicide, seeding the berm with native upland and marsh transition plants, monitoring for 5 year, and weeding/reseeding as necessary. This restoration work would be largely above the wetted marsh elevations (and associated resources) where the Trustees quantified injury from this spill incident.

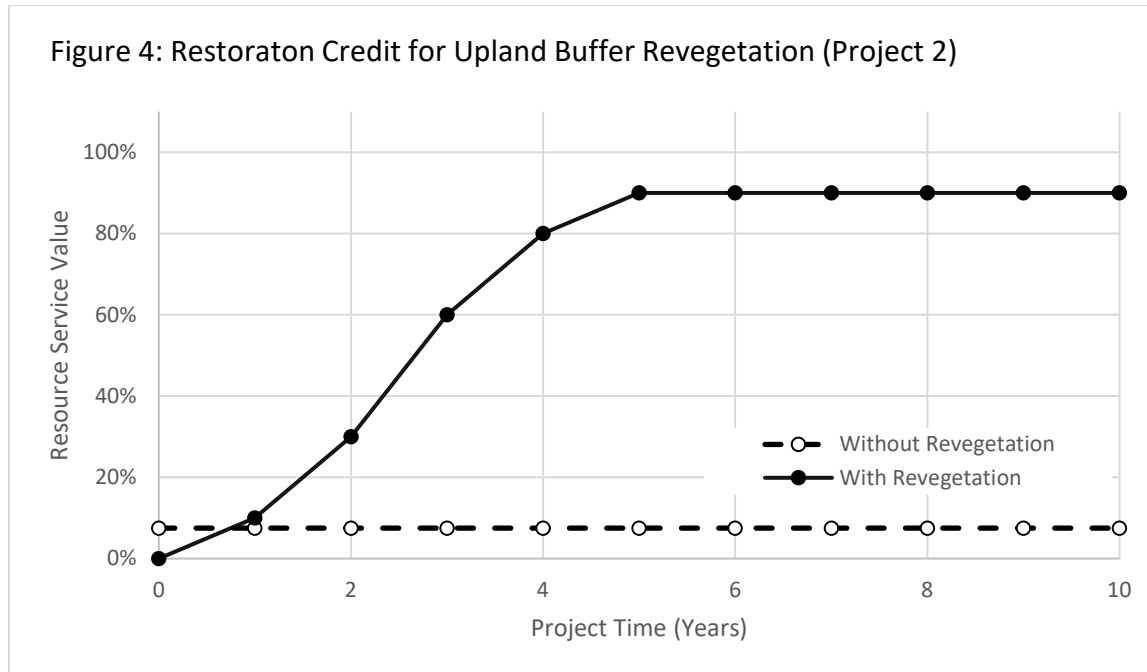
While this project does not provide resource benefits that are in-kind with injury to inundated marsh, it is still part of the greater marsh-habitat complex. It can be implemented and provide some biological benefits in the short-term. These buffer areas are important because they are expected to be inundated at some time in the future due to sea-level rise, and thus these upland areas increase the capacity of the marsh and its associated resources to “migrate” and adapt in the face of climate change.

For the purpose of quantifying restoration benefits, we make the following assumptions (Figure 4):

- The non-native berm currently provides 7.5% resource value, similar to the baseline used for the berm for the Beach Road project described in the DARP/EA .
- It will take 2-3 years for native habitat to establish on the berm and 5 years for that habitat to mature
- The maximum resource benefit of 90% resource service value is achieved at maturity.
- The project will be implemented soon and begin providing resource benefits between May 2023 and May 2024
- The effective project life is 40 years, given risks with respect to the reestablishment of non-natives after the funded monitoring is complete.

Under the above assumptions, the 0.51-acre project provides 6.00 dSAY. This is below the injury quantified by the Trustees in either the initial claim (18.4 dSAY) or the more limited recalculation (13.4 dSAY).

⁷ See “South Pond Berm Option”, transmitted via email 24 August 2022 by Valeria Vartanian.



Project 3: Eradication of European Sea Lavender (LIDU)

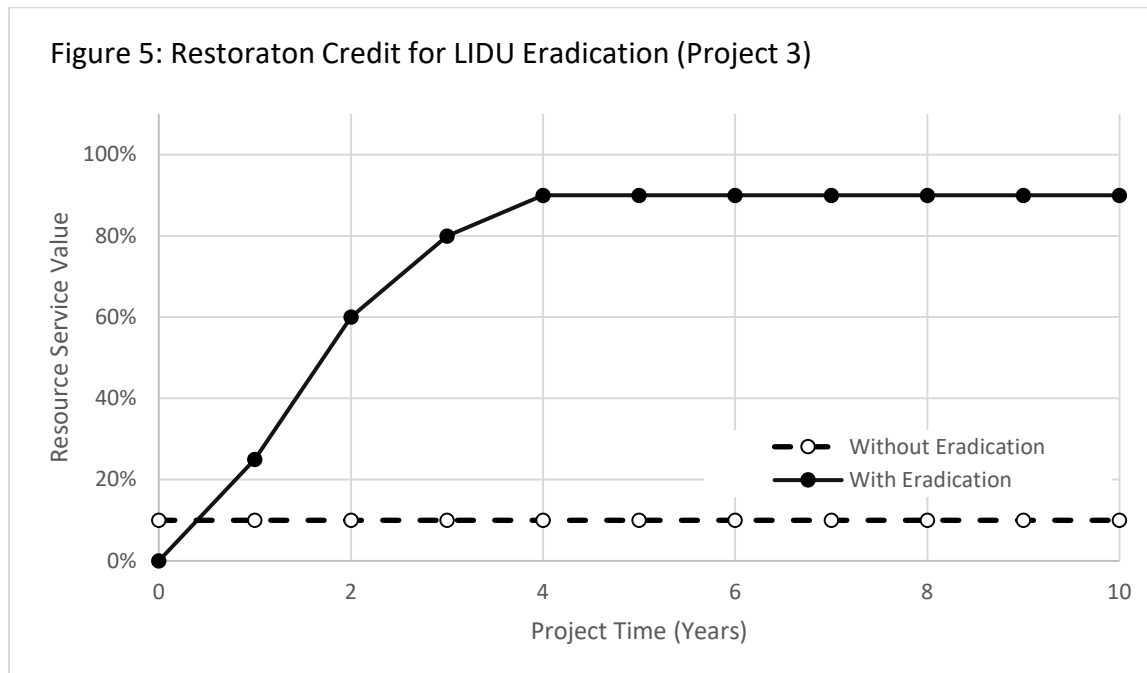
The Navy has identified a project to survey, map, and eradicate the invasive species European sea lavender (*Limonium duriusculum*, LIDU) in locations on the eastern side of Mugu lagoon. Up to approximately 200 acres of marsh are to be surveyed for LIDU. Once mapped, personnel would return to occupied sites, remove individual plants by hand, and continue visiting the sites throughout the growing season to ensure no seeding occurs.

For the purpose of quantifying restoration benefits, we make the following assumptions (Figure 5):

- The project could reasonably stop the spread of as much as 0.5 acre of LIDU. It is possible that the survey and mapping effort could uncover more LIDU than expected.
- Areas with LIDU monocultures provide 10% resource value. While LIDU monocultures are expected to have similar primary productivity as native marsh plants, they are not expected to offer equivalent benefits to native fauna (e.g., pollinators, small mammals, birds).
- Although it may be necessary for repeated treatments over multiple years, restoration benefits are quantified assuming LIDU will be eradicated within the first year.
- It will take 2 years for native vegetation to establish in locations opened by LIDU eradication and 4 years for returning native habitat to mature. This assumes that the individual LIDU stands to be eradicated are small and surrounded by high quality marsh.
- The maximum resource benefit of 90% resource service value is achieved at maturity. This accounts for a chance that LIDU (or other non-natives) will re-establish at some of the treated sites.
- The project will be implemented soon and begin providing resource benefits between May 2023 and May 2024.

- The effective project life is 15-20 years, given uncertainties in reintroduction of LIDU at project sites after project funding is complete. We use 20 years for quantifying restoration benefits.

Under the above assumptions, 0.5 acre of LIDU eradication provides 3.67 dSAY. This is below the injury quantified by the Trustees in either the initial claim (18.4 dSAY) or the more limited recalculation (13.4 dSAY).



Conclusions and Caveats

Neither the debris removal project (0.36 dSAY), the buffer revegetation project (6.00 dSAY), the LIDU eradication project (3.67 dSAY), nor the sum of all three projects (10.4 dSAY) fully compensate for the quantified spill impacts in either the original injury quantification provided by the Trustees (18.4 dSAY) or the fire redacted scenario (13.4 dSAY). This result generally holds even when assigning hypothetical “halo benefits” to the debris removal project that extends the benefits to 500% additional marsh area, and when considering the possibility that there could be twice the amount of debris in the marsh than identified in the scoping analysis (or otherwise included in the cost estimate). In this hypothetical scenario, combining the three projects together would provide 11.31 dSAY in credit.

While the revegetation project appears to be the most beneficial based upon the dSAY measure (6.00 dSAY versus 0.36 dSAY or 3.67 dSAY), this is misleading. The service acre years are different metrics across different habitat types because they are different services. This point is somewhat moot, as (1) the Trustees generally prefer in-kind restoration when it is available, which generally favors the debris removal (and to a lesser degree LIDU eradication) over the upland revegetation project in the context of this spill; and (2) all three projects together still fall below the total injury threshold of either injury scenario. Therefore, all three projects can be justified together as providing partial compensation for the spill.

It may be possible to address some of the uncompensated injury using the framework of the debris removal project. Additional visits to the site may identify additional large debris, which would provide opportunities for additional debris removal and associated resource benefits.