

Supplement to Cosco Busan Oil Spill Final Natural Resource Damage Assessment and Restoration Plan/Environmental Assessment, dated May 6, 2019

Revised Section 4.3.3.2

Restoration of Herring and Subtidal Habitats in San Francisco Bay.

The United States Fish and Wildlife Service (USFWS), the National Park Service (NPS), the Bureau of Land Management (BLM), the National Oceanic and Atmospheric Administration (NOAA), the California Department of Fish and Wildlife (CDFW) formerly the California Department of Fish and Game, and the California State Lands Commission (CSLC) are the Trustees for the Cosco Busan oil spill and have received comments and new information that are pertinent to potential options for restoring herring and intertidal and subtidal habitats injured by the spill. Consequently, the Trustees have prepared, and invite public review and comment on this Supplement to the Cosco Busan Final Natural Resource Damage Assessment and Restoration Plan/Environmental Assessment (DARP/EA). This document proposes the pier piling repair and replacement project as a preferred alternative for implementation.

The pier piling replacement project was discussed as a non-preferred alternative for the restoration of fish and other aquatic organisms in Section 4.3.3 of the Final DARP. It has come to the Trustees' attention that there are new, cost-effective and innovative ways to enhance subtidal habitats by repurposing existing infrastructure (abandoned piers and pilings not eligible for removal) using a commercially available piling-repair jacket that encapsulates creosote-treated piles, providing a non-toxic surface for herring spawn and shellfish. The Trustees now propose the pier piling repair and replacement project as another preferred alternative for the restoration of herring and intertidal and subtidal habitats. This project will not take the place of on-going eelgrass restoration, which is currently underway. It will enhance the eelgrass work and expand habitat for spawning herring and other subtidal organisms. This is not a new request for new funding but will use funds that are remaining under the settlement.

The Trustees incorporate by reference the Final DARP/EA, which is available at:

<https://wildlife.ca.gov/OSPR/NRDA/cosco-busan>.

The discussion below is intended to supplement the "Restoration Alternatives" and "Other Restoration Projects Considered" discussions in Section 4.3.3.2 of the Final DARP/EA. This discussion also supplements the "No Action Alternative" and "Cumulative Impacts" sections.

Public comments on this revised creosote piling restoration proposal may be submitted by email, fax, or mail to:

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Comments are due by June 6, 2019.

Preferred Alternative

Pier and piling repair and replacement for subtidal habitat enhancement for herring spawn

Proposed Preferred Alternative	BENEFITS
Pier piling repair and replacement	Herring, shellfish, scoters

Repurposing Derelict Piers and Pilings

Pacific herring (*Clupea pallasii*) spawning events in San Francisco Bay (SFB) begin in November and continue through March. Herring move inshore to shallow, protected bays, and spawn on available substrates including submerged aquatic vegetation (eelgrass), kelp, rocky intertidal, and man-made structures, such as piers, pilings, and rip-rap.

Creosote-treated piers and pilings are common along the SFB shoreline (Fig. 1) and while efforts are underway to remove these pilings, there are some areas where pilings are *not* eligible for removal because they occur in a sensitive habitat, are important to wildlife or have historical value (Werme et al. 2010). In areas where pilings will remain, there are opportunities for restoration by repurposing these existing structures using a commercially available, inexpensive, and easy to install piling encapsulation technique (Fig. 2). The goal of the project is to create novel substrate to act as a non-toxic surface for fish spawning and invertebrate settlement in subtidal habitats.

The piling-repair system or jacket (Fig. 2b) and rebar cage (Fig. 2c) are designed to stabilize deteriorated piles, preventing them from breaking and becoming marine debris. The external surface and structural cage on the outside can further provide a non-toxic settling surface for vital fish (Fig. 2d) and invertebrate populations (Fig. 2e). Augmenting existing infrastructure with commercially available materials may be a cost-effective alternative to enhance subtidal habitat by creating a self-sustaining, and low maintenance reef with multiple habitat and wildlife benefits (Fig. 3).

Affected Environment

The pilot effort of the project is located at the El Campo Marina, 3700 Paradise Drive, Tiburon, CA. The project may be expanded to additional sites in San Francisco Bay. This area is described in section 2.0 of the Final DARP/EA.

Environmental Consequences (Beneficial and Adverse):

Overall, this project is anticipated to have only minimal adverse environmental consequences and multiple beneficial impacts. In reaching this conclusion, the Trustees evaluated several types of potential impacts, as described below.

1. **Biological Impacts** – This project will have beneficial biological impacts by providing non-toxic herring spawning substrate and structure to improve recruitment of shellfish and other invertebrates. Diving ducks and other avian species may benefit by feeding on the invertebrates growing on the encapsulated pilings. The project also has the potential for some adverse biological impacts associated with the installation process,

but these impacts are expected to be minor and short-term. Any biological communities that have already established themselves on the piles would be eliminated. However, this would be a one-time occurrence without long-term effects. Future generations of biota would colonize the encapsulated pile, thus reaping the benefits of the project.

2. **Physical Impacts** - This project may create benefits to the physical environment, such as water, air, sediments, etc., by reducing the release of contaminants from the un-encapsulated piles. Further, the piling repair jackets are designed to provide support for a deteriorated pile and will prevent breakage causing marine debris. These benefits are likely to be minor, but long-term. To the extent there are any adverse impacts to the physical environment, they are expected to be negligible.
3. **Human Impacts** - The Trustees do not anticipate that there will be any impacts from this project on socio-economics, aesthetics, health and safety, historical properties, etc.

Probability of Success:

The probability of success for this project is high. Herring readily use multiple subtidal surfaces, including pilings, as spawning substrates. Invertebrates are known to settle quickly on novel hard substrate within weeks of deployment.

Performance Criteria and Monitoring:

The project will monitor the treatment piles for herring spawn and invertebrate settlement. In addition, wildlife cameras may be installed to determine the abundance, diversity, and behavior of diving ducks near the piles.

Evaluation

The Trustees have evaluated this project using the threshold and additional screening criteria developed to select restoration projects and concluded that this project is consistent with and meets the objectives of these selection factors. They believe that this type and scale of project will provide tangible benefits to Pacific Herring injured because of the spill and have selected this project as a preferred alternative.

Distribution of Herring spawning areas and artificial structures in San Francisco Bay

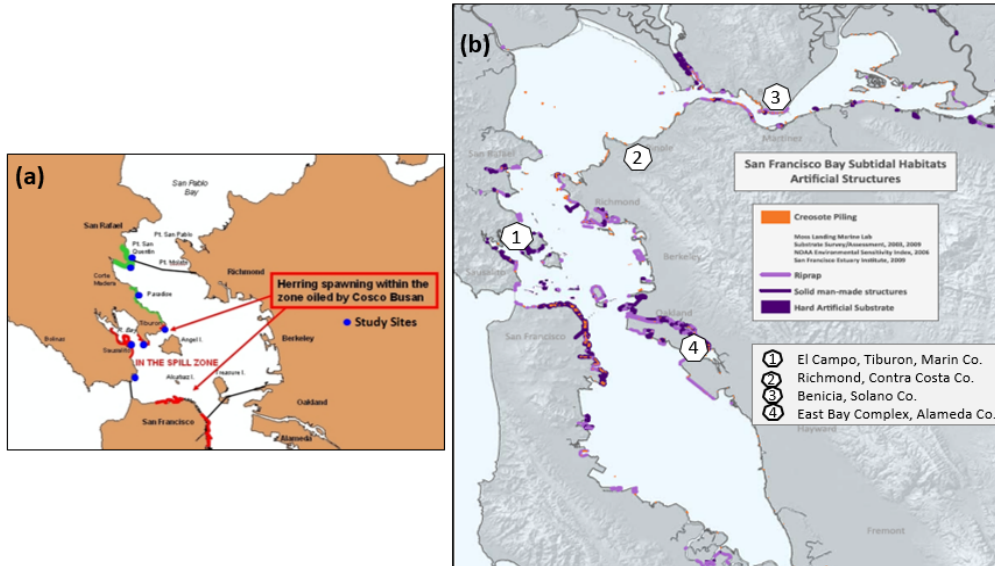


Figure 1: Distribution of herring spawning areas within the Cosco Busan Spill Zone, sampling sites and areas of proposed restoration (a). Distribution of artificial structures in the San Francisco Bay (b) with four proposed sites to enhance subtidal habitat by encapsulating derelict creosote-treated piles. Pilot site at (1) El Campo Marina, Tiburon, Marin County and three additional sites at (2) Richmond/Pinole Complex, Contra Costa County; (3) Benicia, Solano County; and (4) East Bay Complex (Rodeo Point), Alameda County (adapted from Subtidal Habitat Goals report).

Subtidal habitat enhancement using a commercially available piling repair jacket

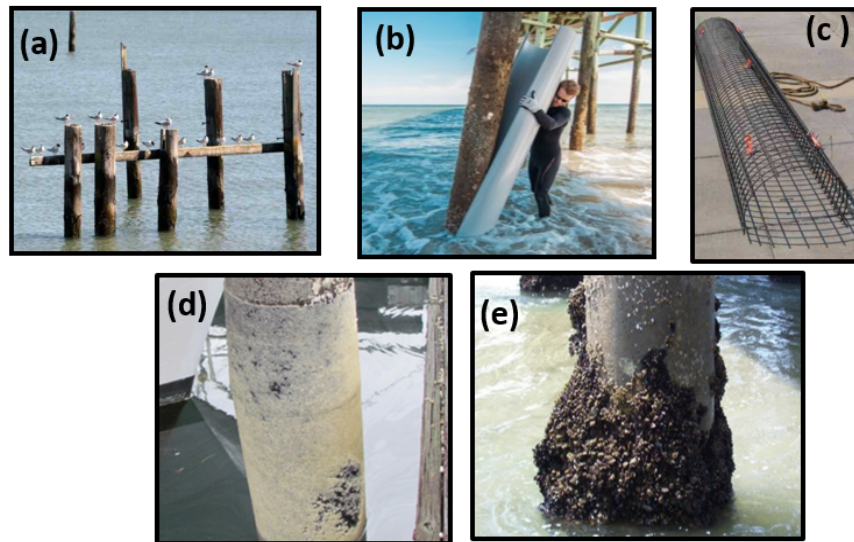


Figure 2: Existing infrastructure like derelict piers and pilings (a) are wrapped with a commercially-available, low cost, and easy to install piling repair systems (b) to seal creosote-treated wood from leaching into the water. Pilings will be surrounded by structural support rebar or wire mesh (c) to provide a durable, non-toxic attachment surface for Pacific herring spawn (d) and shellfish (e).

Subtidal habitat enhancement with piling surface treatments

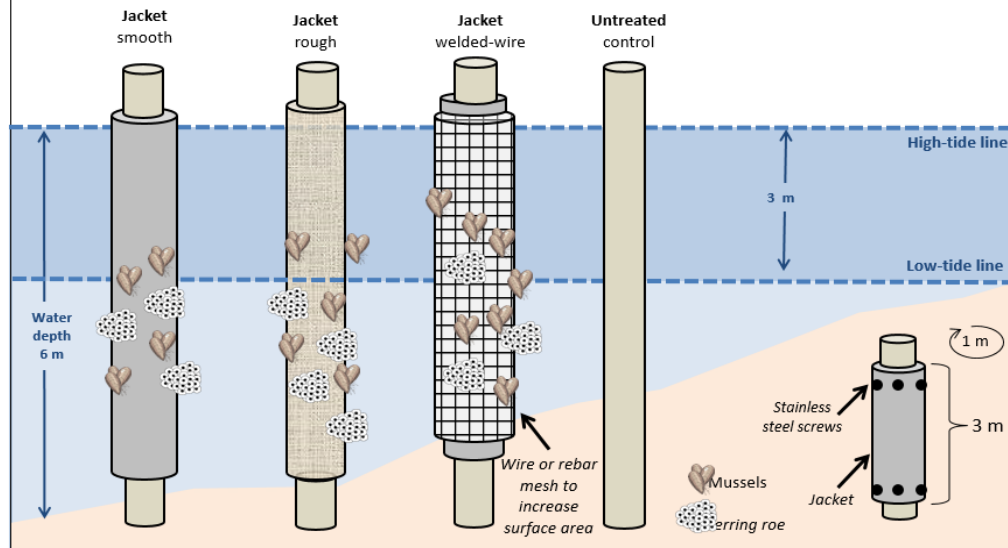


Figure 3: Conceptual diagram of experimental piling repair jackets manufactured with a smooth, rough or welded-wire mesh surface treatment. Jackets are secured with stainless steel screws and sealed with a marine-grade epoxy at the top and bottom to prevent creosote-derived contaminants from leaching to the water.