

## **Invasive Perennial Pepperweed (*Lepidium latifolium*) Control on Grizzly Island Wildlife Area Complex**

Fourth and Final Report to the Natural Resource Trustee Council Representatives

### *Background*

On 27 April 2004, an underground 14-inch diameter petroleum pipeline owned or operated by Kinder Morgan Energy Partners, L.P. and SFPP L.P. (the responsible parties) ruptured and discharged approximately 123,774 gallons of diesel fuel into a managed marsh in Suisun Marsh, Solano County, California.

Following the initial response activities, the Natural Resource Trustees (in this case, the United States Fish and Wildlife Service [USFWS] and the California Department of Fish and Wildlife [CDFW]) along with the responsible parties cooperatively developed a natural resource damage assessment (NRDA) for natural resources, including both plants and animals, affected by the discharge. The NRDA was followed by a monetary settlement for projects to compensate for injuries and a damage assessment and restoration plan (DARP). The Natural Resource Trustees entered into a Memorandum of Understanding (MOU) dated July 24, 2008 for the purpose of coordinating their trust responsibilities and utilizing the settlement monies for restoring, rehabilitating, replacing, and/or acquiring the equivalent of injured natural resources resulting from the spill. The MOU established a Trustee Council to oversee restoration planning and implementation and associated management of the settlement money.

In 2010, the DARP identified two restoration projects within Suisun Marsh, with a combined cost of \$950,000, which could best compensate the public for the loss of the damaged natural resources. One project will restore tidal flow to a managed marsh (\$800,000), and the other will control the invasive weed, perennial pepperweed (*Lepidium latifolium*). This annual report addresses only the weed control project.

Perennial pepperweed control benefits the endangered salt marsh harvest mouse and California clapper rail and two endangered plant species. In addition to these sensitive species, pepperweed control benefits nesting and foraging waterfowl, Suisun shrew, northern harrier, burrowing owl, song sparrow, and other species.

The goal of this project is to expand control measures on perennial pepperweed in marshland within the Grizzly Island Wildlife Area Complex (all CDFW owned

lands in Suisun Marsh with the exception of the Garibaldi Unit). The tasks include chemically treating pepperweed with Chlorsulfuron (Telar<sup>®</sup>), which has been found to be the most effective herbicide for eradicating pepperweed (J. Trumbo, pers. comm.).

#### *Location of project*

This project is being implemented on the Grizzly Island Wildlife Area Complex (Complex), set within the Suisun Marsh, which occupies about 15,300 acres of prime wildlife habitat. The complex is a patchwork of 10 distinct land parcels, many of which are not connected and are surrounded by private land.

#### *Objectives of project*

The main objective of this project is to reduce acreage of perennial pepperweed in the Complex. Complete eradication is probably not possible due to continued input of propagules from private lands within Suisun Marsh and areas outside of Suisun Marsh. The currently affected acreage will be prioritized, with areas containing sensitive or otherwise highly desirable resources, as well as areas where control has a high probability of success (*e.g.*, recent invasions), treated first. A secondary objective is to limit perennial pepperweed spread to adjacent public and private lands.

#### *Performance criteria and monitoring*

CDFW personnel are responsible for periodic monitoring and follow-up treatments of the habitat to ensure longer-lasting benefits from these weed control efforts. Annual updates by the CDFW staff of the Complex were provided to the Trustee Council Representatives regarding the status of the habitat and the success of the weed control treatments. In addition, every three years, aerial photographs of the Suisun Marsh are taken in conjunction with the Triennial Vegetation Survey of Suisun Marsh. These were taken in June 2009, 2012, and 2015. A mapping analysis report is created following these photography efforts. Since the white flowers of perennial pepperweed in June are easily identifiable in these photographs, these photographs and subsequent vegetation analyses serve as an easy and accurate method of measuring the success of the project.

*Tasks accomplished 2013-2016*

Task 1. Identify and prioritize treatment areas.

A biologist, Sarah Estrella, met with the Grizzly Island Wildlife Area supervisor, Pat Graham, to identify and prioritize treatment areas.

Task 2. Purchase 1 Model 9TDE150 Intelli-Spray remote control retractable hose reel system, with 150 gal. tank, trailer, and 1,200' hose.

This was purchased in 2010.

Task 3. Purchase chemicals to treat 40 acres.

CDFW still has 20 pounds of Telar<sup>®</sup> in stock at the end of 2016, enough to treat approximately 160 acres of pepperweed. No new Telar<sup>®</sup> was purchased. However, safety and other herbicide application supplies totaling \$583.90 were purchased in 2011. A total of 31 acres were treated by CDFW from 2011-2014.

Task 4. Conduct any rare plant surveys.

*Cirsium hydrophilum* var. *hydrophilum* (Suisun thistle) and *Chloropyron molle* ssp. *molle* (soft salty bird's-beak) surveys were conducted by CDFW biologists in 2012 and 2015 on much of CDFW lands where this species may occur. Populations were mapped and reported to the California Natural Diversity Database.

Task 5. Conduct any necessary training in herbicide application or avoidance of sensitive resources.

The lead on this project received annual continuing education from CDFW's Pesticide Investigations Unit and renewed her Qualified Applicator's Certificate from the Department of Pesticide Regulation in 2014 and 2016. A scientific aide was trained in 2012 to assist in the project.

Task 6. Pay one CDFW Scientific Aide to assist CDFW staff with chemical applications in sensitive areas.

In 2012, a scientific aide assisted staff with chemical applications using the Intelli-Spray system. Between May 1 and June 1, 2012, CDFW staff treated 5 acres on the Joice Island Unit and 3 acres on Pond 10 at the Grizzly Island Wildlife Area; and 11 acres on Ponds 4 and 4A at the Hill Slough Wildlife Area. A scientific aide assisted for a total of 6 days at a cost of approximately \$1,200.00.

Task 7. Hire a contractor to treat 300 acres.

The contracted spray company, DeAngelo Brothers, Inc., began treating fields in May 2012. They treated 38 acres May 5-8, 2012, on the Grizzly Island Wildlife Area at a cost of \$14,474.58. They treated 252 acres from 4/30 to 5/22, 2013, at a cost of \$99,789.42. A total of 290 acres were treated at a total cost of \$114,264. Ten acres were treated at Crescent Unit, a salt marsh harvest mouse management area; 17 acres were treated at Pond 4A at Hill Slough Wildlife Area, another mouse management area; and 263 acres were treated on Grizzly Island.

Task 8. Provide an Annual Report of results of treatment to the Trustee Council Representatives by December 31 each year.

This is the fourth and final report summarizing activities 2013-2016.

CDFW's Vegetation Classification and Mapping Program (VegCAMP) performs a vegetation map for Suisun Marsh every third year. At the time of this writing, the 2015 mapping effort has not been made available. This would have shown the difference in *Lepidium* coverage between 2012 and 2015 and would measure the success of the 2013 treatment.

However, the 2012 effort measured the success of the May 2012 treatment by comparing 2009 *Lepidium* coverage with 2012 *Lepidium* coverage for the 38 acres sprayed on Grizzly Island (Fig. 1 and 2). It appears that *Lepidium* was reduced in 2012 on the ponds that were treated.

In 2012, *Lepidium latifolium* was the second most abundant non-native species of concern, dominating 787 acres of the Marsh. It was down by 243.7 acres since its peak coverage in 2003, when it was 1,030.4 acres. In the leveed areas there was a decrease of 25 acres between 2009 (529 acres) and 2012 (504 acres). In the tidal areas of the Marsh *L. latifolium* decreased by 33.2% (or 139.9 acres) between 2009 and 2012.

#### *Reference*

United States Fish and Wildlife Service (USFWS) and California Department of Fish and Game. 2010. Exhibit A – Scope of Work and Budget: Invasive Perennial Pepperweed (*Lepidium latifolium*) Control on Grizzly Island Wildlife Area Complex. 12 pp.



Figure 1. *Lepidium* dominated vegetation mapped on Grizzly Island 2009.



Figure 2. *Lepidium* dominated vegetation mapped on Grizzly Island 2012.

*Author of this report*

Sarah Estrella  
Environmental Scientist  
California Department of Fish and Wildlife  
Bay Delta Region (Region 3)  
2109 Arch Airport Road  
Stockton, CA 95206  
Office: [\(209\) 234-3677](tel:2092343677)  
e-mail: [sarah.estrella@wildlife.ca.gov](mailto:sarah.estrella@wildlife.ca.gov)

May 12, 2017