



A Company of Specialists

August 6, 2009

Mr. John Martin
U.S. Fish and Wildlife Service
14715 Highway 94
Jamul, CA 91935

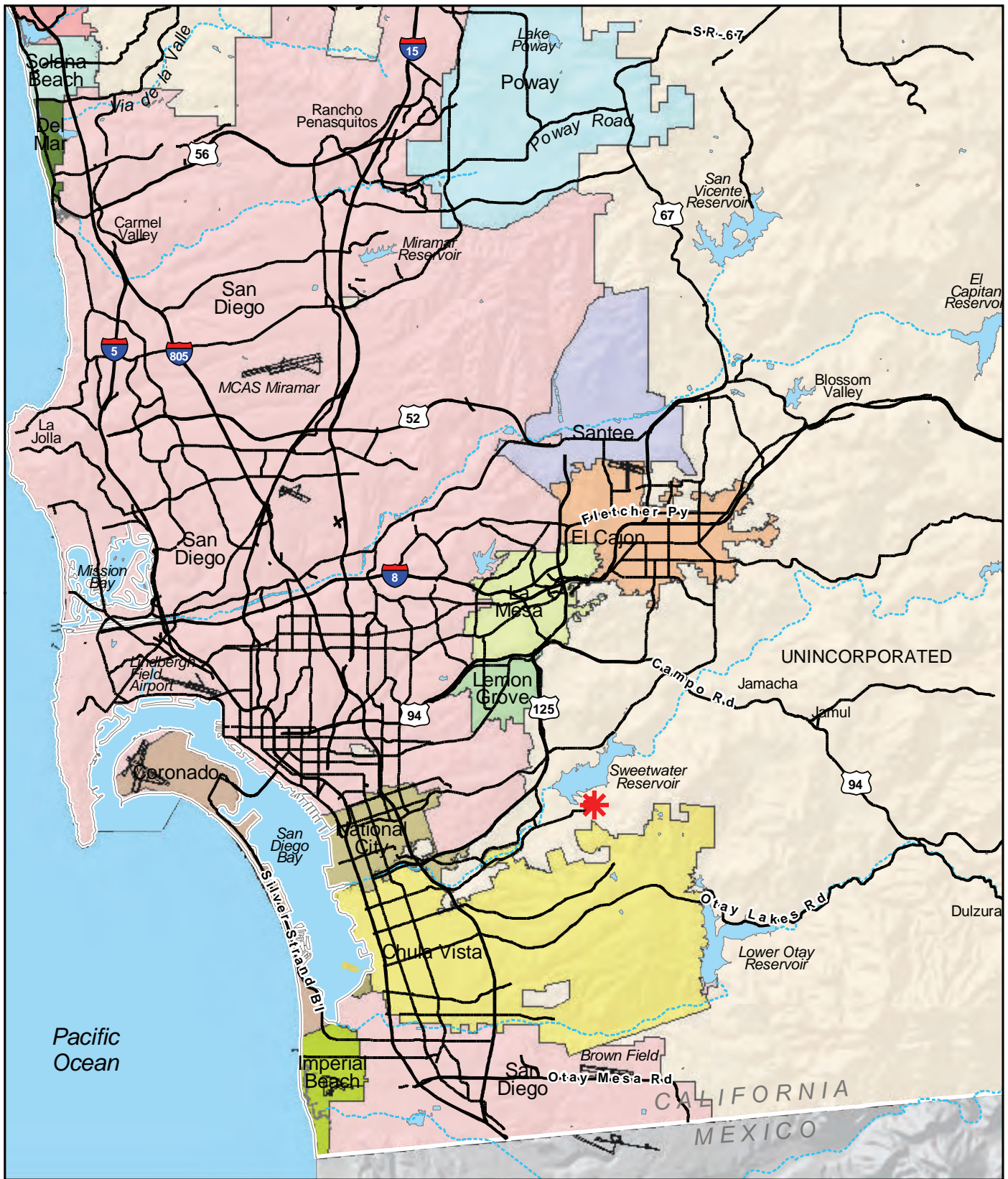
Reference: 2009 Progress Report for the Shinohara Vernal Pool Complex Weed Control Project
(RECON No. 4803)

Dear Mr. Martin:

This letter summarizes the activities conducted for the Shinohara Vernal Pool Complex Weed Control Project during winter 2008 through summer 2009. The project site is located within the San Diego National Wildlife Refuge, north of SR-125 and San Miguel Road, west of San Miguel Avenue, and south of the Sweetwater Reservoir in San Diego, California (Figures 1 through 3). A summary of work completed and personnel involved is presented in Table 1.

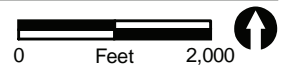
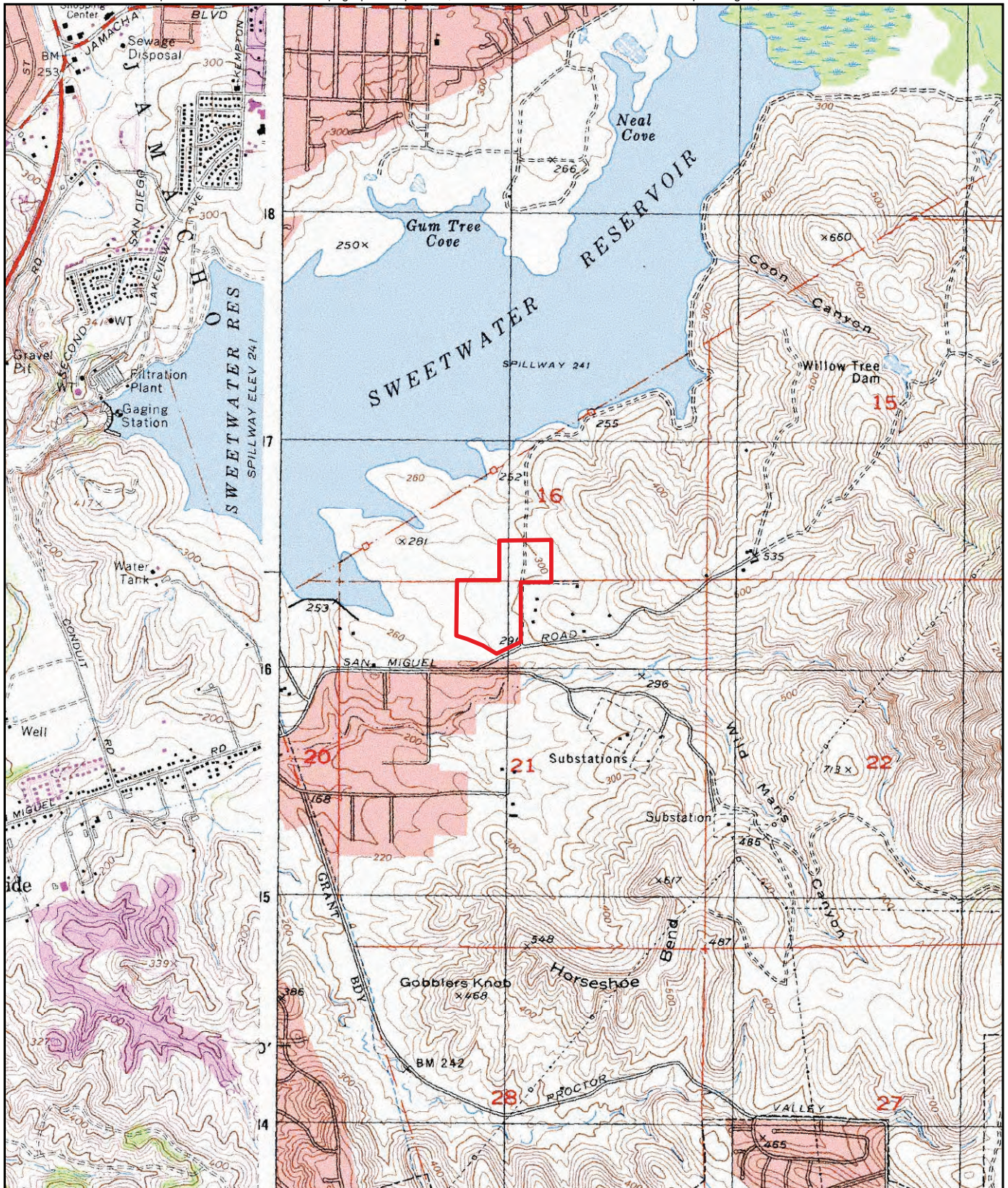
**TABLE 1
SUMMARY OF WORK COMPLETED**

Date	Description	Personnel
Dec. 16, 2008	Qualitative Monitoring	M. Olson
Dec. 18, 2008	Qualitative Monitoring	M. Olson
Dec. 29, 2008	Qualitative Monitoring	M. Olson
Dec. 29-31, 2008; Jan. 2, 5, and 27, 2009	Herbicide Treatment 1	RECON Field Crew
Jan. 20, 2009	Qualitative Monitoring	M. Olson
Jan. 30, 2009	Qualitative Monitoring	M. Olson
Feb. 23, 2009	Qualitative Monitoring	M. Olson
Mar. 31, 2009; Apr. 7, 15-17, and 24, 2009	Herbicide Treatment 2	RECON Field Crew
Apr. 3, 2009	Qualitative Monitoring	M. Olson
Apr. 6-8, 2009	Hand Weeding	RECON Field Crew
Apr. 8, 2009	Qualitative Monitoring	M. Olson
Apr. 14-17, 2009	Qualitative Monitoring	M. Olson
Apr. 15, 2009	Qualitative Monitoring	M. Olson
Apr. 20, 2009	Qualitative Monitoring	M. Olson
Jun. 12, 2009	Qualitative Monitoring	M. Olson
Jun. 12, 15, and 17, 2009	Herbicide Treatment 3	RECON Field Crew
Jun. 12, 15, and 17, 2009	Hand Weeding	RECON Field Crew
Jul. 15, 2009	Qualitative Monitoring	M. Olson
Jul. 15-17, 2009	Hand Weeding	RECON Field Crew



 Project Location

FIGURE 1
Regional Location



 Project Area

FIGURE 2
Project Location on USGS Map



- Project Area
- Photo Location
- NORTH
- SOUTH

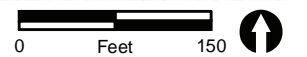


FIGURE 3

Vernal Pools in Project Area

Herbicide treatment of invasive species began on December 29, 2008 and continued through July 17, 2009. Treatments included three herbicide applications and hand weeding within the vernal pools. Table 2 presents the hours worked on each of the four treatments. Invasive species of primary concern included mustard (*Brassica* sp.), filaree (*Erodium botrys*), Russian thistle (*Salsola tragus*), and fennel (*Foeniculum vulgare*). Within the vernal pools, the primary weeds of concern were Italian ryegrass (*Lolium multiflorum*), rabbitfoot (*Polypogon monspeliensis*), and hyssop loosestrife (*Lythrum hyssopifolium*). Photographs 1 through 4 show the site prior to the second herbicide treatment.

**TABLE 2
 SUMMARY OF HOURS WORKED**

Treatment	Hours Worked in 2008	Hours Worked in 2009
Treatment 1	374	253
Treatment 2	356	219
Treatment 3	358	80
Treatment 4 (Hand Weeding)	Not Performed	544
TOTAL	1,088	1,096

Herbicide was applied either directly from an herbicide truck or using backpack sprayers (Photographs 5 and 6). When windy conditions occurred, only low-pressure backpack sprayers were used to prevent drift. All herbicide applications were prescribed by, and under the supervision of, a California Licensed Applicator (QAL). All herbicide applications were performed with a glyphosate-based herbicide. A description of the herbicide and quantities used is presented in Table 3. All herbicides were used in conjunction with blue marking dye. Inoculated pools, pools with fairy shrimp, and pools with vernal pool plant species were flagged and special attention was given to not use herbicide within or near these pools (Photograph 7). Pools 4, 5, and 6 were inoculated with mud from neighboring vernal pools before the onset of the 2008-2009 rainy season (J. Martin, pers. comm.). After ponding, fairy shrimp surveys were performed by USFWS within the vernal pools. Pools 1, 3, 4, and 34 (natural pool) were found to contain San Diego fairy shrimp (*Brachinecta sandiegoensis*) (J. Martin, pers. comm.). Additionally, pools 2, 11, 16, 22, 25, 26, 28, 30, and 32 contained vernal pool plant species (Photographs 8 and 9). Weed species within these pools were removed by hand (Photograph 10). When dry, all other pools were treated with herbicide and the dead weed material was removed from the site (Photograph 11).

**TABLE 3
 SUMMARY OF HERBICIDES AND QUANTITIES USED**

Treatment	Herbicide	Quantity Use
Treatment 1	Buccaneer	17 gallons
Treatment 2	Buccaneer	17 ½ gallons
Treatment 3	Buccaneer	6 gallons
TOTAL		40 ½

A total of 30 acres were treated during the period of December 2008 through July 2009. Photographs 12 through 23 display the treatment area after the final herbicide application and all hand pulling was completed.

To date, weed treatment at the Shinohara Vernal Pool Complex has been successful. Weed populations have been declining since the implementation of the project and the existing native species on-site have been thriving. Within the vernal pools, native flora and fauna have been



PHOTOGRAPH 1
Site Looking North Before Herbicide Treatment 2, February 2009



PHOTOGRAPH 2
Site Looking South Before Herbicide Treatment 2, January 2009



PHOTOGRAPH 3
Site Looking East Before Herbicide Treatment 2,
February 2009



PHOTOGRAPH 4
Site Looking West Before Herbicide Treatment 2, February 2009



PHOTOGRAPH 5
Herbicide Application from Herbicide Truck, December 2008



PHOTOGRAPH 6
Herbicide Application from Backpack Sprayers, December 2008



PHOTOGRAPH 7
Pool 16 Flagged For Hand Pulling, April 2009



PHOTOGRAPH 8
Ponded Pools Looking Northwest, February 2009



PHOTOGRAPH 9
Ponded Pool Looking Northeast, February 2009



PHOTOGRAPH 10
Hand Pulling within Vernal Pools, July 2009



PHOTOGRAPH 11
Vernal Pool After Hand Pulling, July 2009



PHOTOGRAPH 12
Photopoint 1 Looking North After Final Treatment, July 2009



PHOTOGRAPH 13
Photopoint 1 Looking South After Final Treatment, July 2009



PHOTOGRAPH 14
Photopoint 1 Looking East After Final Treatment, July 2009



PHOTOGRAPH 15
Photopoint 1 Looking West After Final Treatment, July 2009



PHOTOGRAPH 16
Photopoint 2 Looking North After Final Treatment, July 2009



PHOTOGRAPH 17
Photopoint 2 Looking South After Final Treatment, July 2009



PHOTOGRAPH 18
Photopoint 2 Looking East After Final Treatment, July 2009



PHOTOGRAPH 19
Photopoint 2 Looking West After Final Treatment, July 2009



PHOTOGRAPH 20
Photopoint 3 Looking North After Final Treatment, July 2009



PHOTOGRAPH 21
Photopoint 3 Looking South After Final Treatment, July 2009



PHOTOGRAPH 22
Photopoint 3 Looking East After Final Treatment, July 2009



PHOTOGRAPH 23
Photopoint 3 Looking West After Final Treatment, July 2009

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observed, including San Diego fairy shrimp and woolly marbles (*Psilocarphus brevissimus* var. *brevissimus*). It is anticipated that with continued weed treatment and the introduction of additional inoculum and seeds, the created vernal pools will eventually mimic the natural pool on-site (pool 34). It is recommended that weed treatment continue to occur prior to weed species flowering and setting seed, especially at the perimeter of the vernal pools. Within the vernal pools, weed species densities are kept low by long periods of inundation. However, the addition of native vernal pool plant species would improve the pools ability to outcompete weed species, as well as provide habitat for vernal pools invertebrates. Additional planting and seeding of upland and grassland species would similarly benefit the site, as they provide competition for weed species and habitat and foraging ground for native animals. After two years of weed treatment, weed species within the site are under control and the site is well prepared for container planting.

If you have any questions or comments, please contact me at (619) 308-9333 or by e-mail at molson@recon-us.com.

A handwritten signature in black ink that reads "Meagan Olson". The signature is written in a cursive, flowing style.

Meagan Olson
Restoration Biologist

MAO:eab

Reference Cited

Martin, John. "Shinohara: Vernal Pool Map." E-mailed to the author on Jan 12 and 13, 2009.