San Diego Association of Governments (SANDAG)
Memorandum of Understanding (MOU) #5004552

Strategic Removal of Invasive Weed Species
1st Quarter Report - FY 2015-16: Report #4 for Project

July 1, 2015 – Sept 30, 2015

Project: County of San Diego, Department of Agriculture, Weights & Measures – Strategic Removal of Invasive Weed Species

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Project:

Invasive plants are considered one of the biggest threats to endangered species and their habitats. A strategic plan for managing non-native invasive plant species in San Diego County was completed in 2012 through a SANDAG contract to the Conservation Biology Institute (CBI) (http://sdmmp.com). The Invasive Plant Strategic Plan (IPSP) is designed to develop a strategic approach towards the eradication and management of invasive plants in the San Diego region. The IPSP is meant to work in conjunction with the Management Strategic Plan for Conserved Lands in Western San Diego County (MSP) (Management Strategic Plan).

This Scope of Work will require the contractor to focus on the management of invasive plants identified in Levels 1, 2, and 3 of the IPSP. The following tasks have been identified as necessary to implement this effort:

TASK 1 – Invasive Plant Species Coordinator:

Level of Effort: (25%) of overall contract

1) Right of Entry (ROE) Work:
Significant progress occurred in completing ROE agreements with several key entities in the region. The Department of Agriculture, Weights and Measures Integrated Pest Control Program (AWM IPC) completed ROE agreements with the following three entities: City of San Diego (both Parks and Open Space Division, and Public Utilities Division), the Port District of San Diego, and Sweetwater Authority. These agreements augmented access to significant lands in the County (Figure 1, Table 1). Additional ROEs were obtained for several other small sites (private and municipal properties). The State of California (various departments) is one of the largest land owners in the county. The program already has permission from California Department of Fish and Wildlife (CDFW) for work on lands that they manage. Over the next two quarters the program will work with California Department of Parks and Recreation, and Caltrans to obtain legal access to their properties.

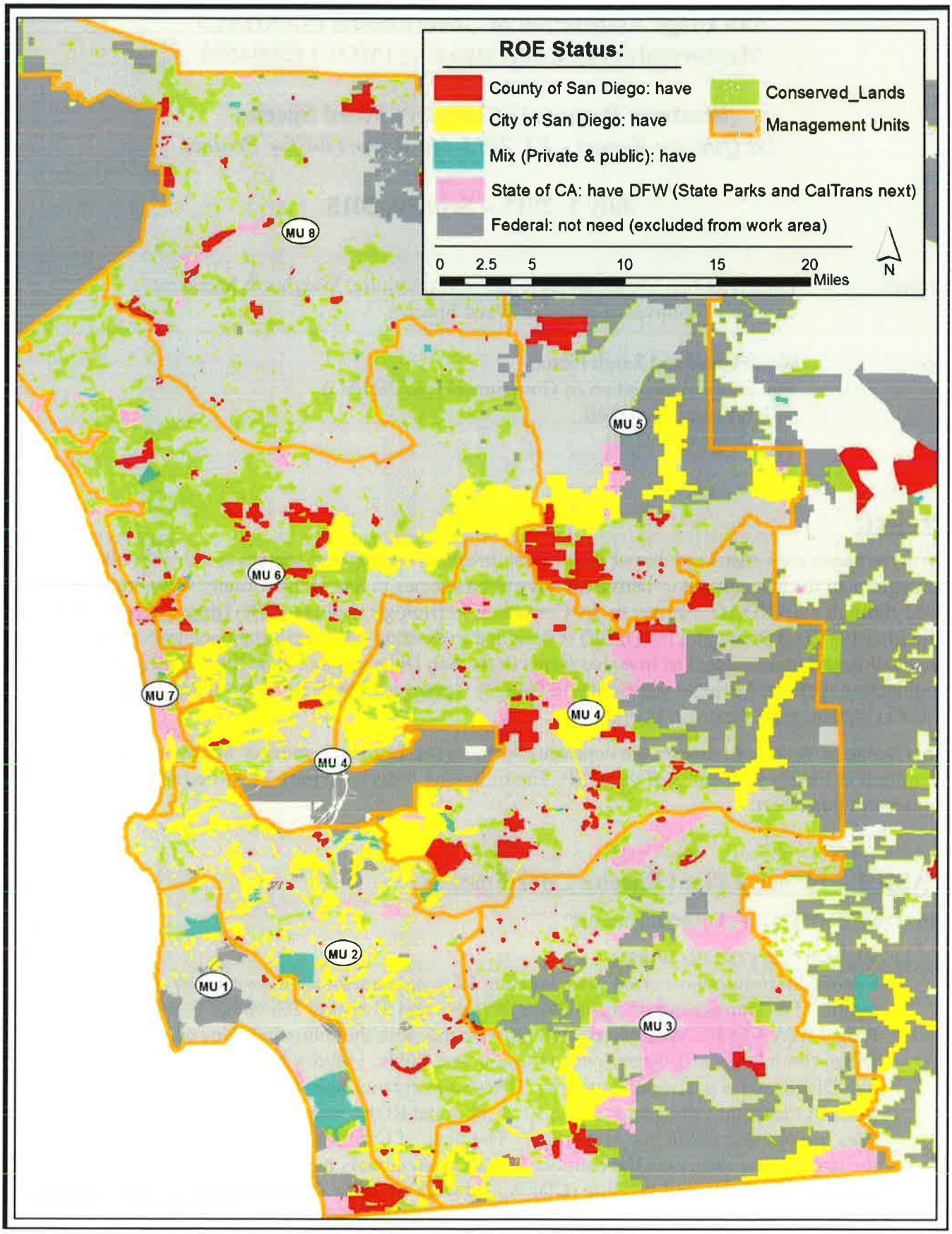

Figure 1. Right of Entry Status

Table 1. Summary of ROEs by entity (public agencies or large landholders/programs)

Entity	Type of agreement	Length of agreement	Status	Breadth of agreement
County of San Diego*	Implicit (AWM is County of SD)	Continuous	Complete	All lands
City of San Diego: Parks and Open Space	City ROE	3 Years	Complete	All open space and park lands
City of San Diego: Public Utilities Division	City ROE	3 Year	Complete	Public Utilities Division Lands
Unified Port of San Diego	Unified Port of San Diego ROE	2 Years	Complete	Chula Vista Nature Reserve
California Department of Fish and Wildlife (CDFW)	CDFW ROE	Continuous	Complete	North County estuaries
Sweetwater Authority	Sweetwater Authority ROE	2 years	Complete	Sweetwater Eupatory site
City of Carlsbad: Parks Department	AWM ROE	Continuous	Complete	Ward's weed site
City of Carlsbad: Roads Department	AWM ROE	Continuous	Complete	Sea lavender site
City of Solana Beach	AWM ROE	Continuous	Complete	Sea lavender site
Various private properties: 5	AWM ROE	Continuous	Complete	
Caltrans	Making determination	Pending determination	In process	Three sites
California Department of Parks & Recreation	Making determination	Pending determination	In process	Unknown

*Includes parks, open space, and roads.

2) The coordinator worked at five field sites.
   - *Euphorbia terracina*: This Management Level 1 species was identified at two sites, located at Penasquitos Canyon and near Highway 56 (Figure 2). This species was not known to occur in the county prior to the confirmed sightings. The species was misidentified in 2006 as a different *Euphorbia* species. The identification was updated in 2014 and then detected when the species identification was updated in the Consortium of California Herbaria (CCH) database. The coordinator surveyed areas around these sites to help determine the plant's distribution. The coordinator met with property owners and assisted crews in defining the site/work areas for the KB Home portion of the Highway 56 site.

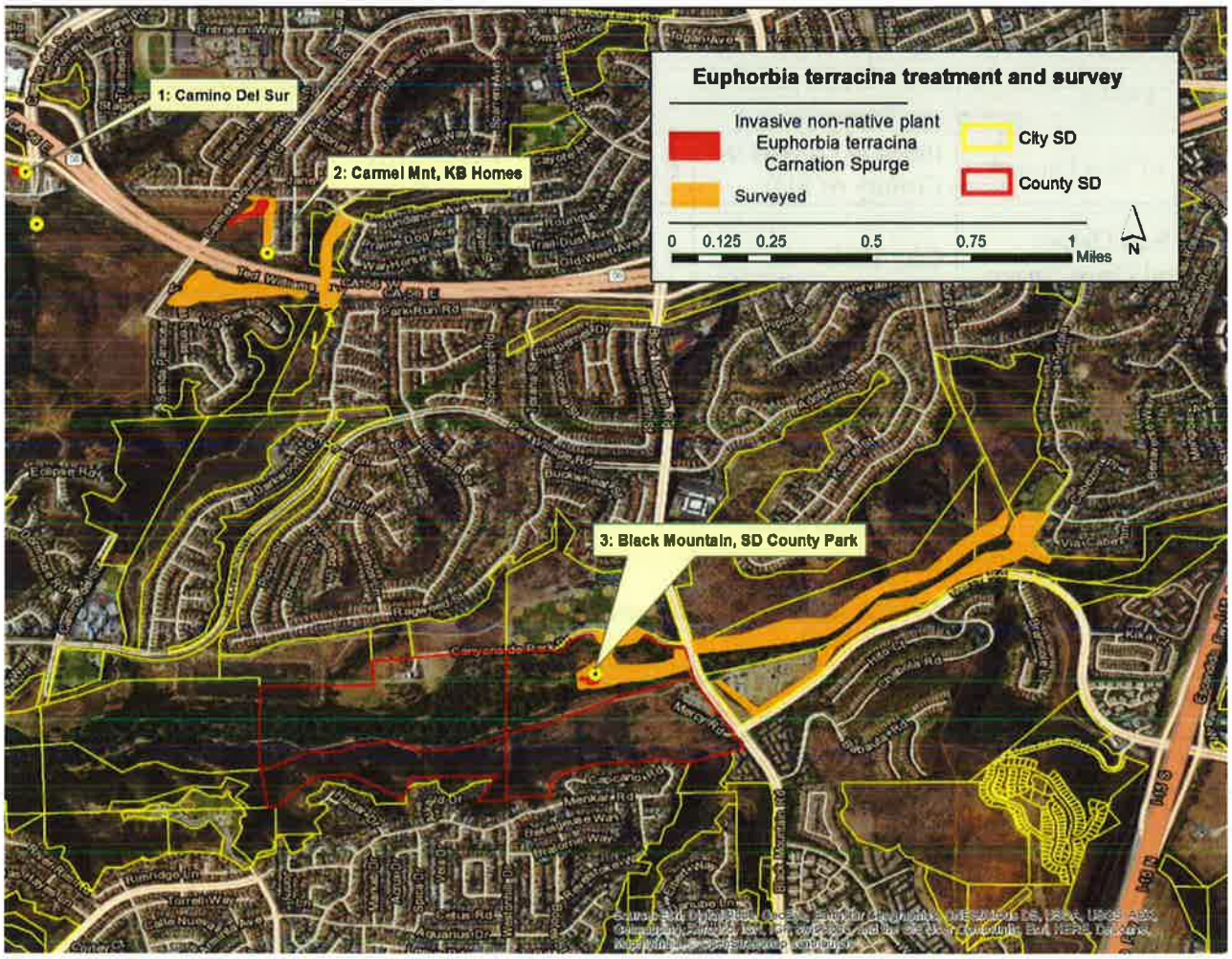

Figure 2. *Euphorbia terracina* sites on Penasquitos Canyon.

- *Algerian sea lavender:* Two sites (Ocean Terrace and La Costa Ave) were monitored and treated. Several visits were made to Ocean Terrace to coordinate work with the HOA landscaping maintenance contractor that manages the site. La Costa Avenue was visited and re-treatments made as control varied from high (>90%- much of the site) to low (approximately 50%- eastern portion of site).

- *European sea lavender*: The site at San Elijo Lagoon was enlarged to include the infestation source along the Coastal Rail Trail. The City of Solana Beach granted permission for the work, and coordination occurred with three city staffers. The source plants were planted in 2009 by a garden club. The plants covered the entire bed where they were planted and were spreading aggressively into adjacent beds. The area is approximately 100 yards by 40 feet. The area drains into the west basin of San Elijo Lagoon (where they were becoming established). Plants were in flower with seed. Mature plants were pulled, bagged, and disposed. Smaller seedlings were foliar sprayed. The west basin lagoon site was monitored, and all observed plants were pulled by the coordinator (350 plants).

TASK 2 – AWM: Invasive Plant Level 1 Management

Level of Effort: (<10%) of overall contract

Table 2. Summary of treatments performed by AWM on Level 1 species this quarter.

Scientific Name	Common Name	# of Sites Worked	Acres Surveyed	Acres Treated	Plants treated
Euphorbia terracina	carnation spurge	2	17.37	1.64	9,198

***Euphorbia terracina* (carnation spurge): Sites #1 & #2**

This species was not known to occur in San Diego County. It is highly invasive and is a significant problem in the Santa Monica Mountains in Los Angeles County. The species was misidentified as a different *Euphorbia* species in 2006. The identification was updated in 2014 and the program became aware of the plant's presence in the Penasquitos Valley in June 2015. Surveying was initiated and two areas were treated over 9 working days (Figure 2). Mature plants were pulled, bagged, and disposed. Seedlings in the northern portion of the KB Home site were treated with a foliar application of glyphosate. 1.53 acres (8,798 plants) were treated at the KB Homes site. At the second site at Penasquitos County Park, 0.15 acres (400 plants) were treated. There are also plants at a third area (Camino Del Sur), but the property owner has not yet completed the ROE. Some plants in the open space (southern portion of site) were pulled by California Native Plant Society volunteers.

TASK 3 – AWM: Invasive Plant Level 2 Management.

Level of Effort: (>40%) of overall contract

AWM IPC surveyed, treated, and manually removed 6 invasive weed species at 11 sites this quarter: bridal broom, yellow starthistle, eupatory, Ward's weed, European sea lavender, and Algerian sea lavender. Additional preparation work occurred for one Canary Island St. John's wort site (Balboa Park) and one sea lavender site (Port District of San Diego). AWM IPC made optimal pesticide applications, protected the natural environment by preventing off-site movement of pesticides, and utilized Best Management Practices (BMPs) that prevented unintentional discharges to surface waters. For each site, AWM IPC followed the following procedures:

1. Identified the pest species to be treated.
2. Reviewed site conditions, such as soil texture, slope, standing water, irrigation or storm drains.
3. Identified and avoided streamside management areas and surface waters to prevent drift and application of pesticides not labeled for aquatic use onto surface waters.
4. Identified most appropriate method of control based on integrated pest management methods, designed to minimize the scale and number of pesticide applications.
5. Applied the least persistent and least toxic pesticide that effectively mitigates the target pest.

Table 3. Summary of treatments performed by AWM on Level 2 species this quarter.

Scientific Name	Common Name	# of Sites Worked	Acres Surveyed	Acres Treated	Plants treated
Ageratina adenophora	eupatory	1	3.59	0.02	20
Carrichtera annua	Ward's weed	1	6.66	0.04	104
Centaurea solstitialis	yellow starthistle	3	125.35	0.22	190
Limonium duriusculum	European sea lavender	1	0.82	0.13	12,779
Limonium ramosissimum	Algerian sea lavender	2	7.32	4.86	>500,000
Retama monosperma	bridal broom	2	11.85	0.12	230

***Ageritina adenophora* (eupatory): Site #3**

Eupatory site #3 on the San Diego River was re-surveyed and partially treated. Two site visits occurred. Approximately 0.02 acres of plants were treated using glyphosate (foliar application).

***Carrichtera annua* (Ward's weed): Site #2**

Ward's weed site #2 is located on 2 parcels of land, one owned by La Costa Greens HOA, and the other by the Center for Natural Lands Management (CNLM). 1.5 work days were spent surveying and treating 104 seedlings (rains occurred in June and July).

***Centaurea solstitialis* (yellow starthistle): Site #4, #8, and #15**

Yellow starthistle was treated at sites #4 (Wynola Estates) and #8 (Mendenhall Valley). Site #15 (Emerald Crest) was surveyed twice but no plants were found. Additional sites were treated with California Department of Food and Agriculture (CDFA) funding. 190 Plants were manually removed by AWM IPC staff within a 116.62 acre area, over 6 work days (Figure 3).

Figure 3. Yellow starthistle sites in San Diego County.

Limonium duriusculum (European sea lavender): Site #2

European sea lavender site #2 San Elijo Lagoon was treated (Figures 4, 5, 7, & 8). The southern population along Highway 101 in City of Solana Beach landscaping was hand pulled (12,779 plants, 0.13 acres). Smaller seedlings and plants in open disturbed areas were foliar sprayed with glyphosate (4%). A total of 6 work days were spent at the site. The west basin in San Elijo Lagoon was also surveyed, and the coordinator pulled 350 plants (Figure 6).

Figure 4. European sea lavender treatments at San Elijo Lagoon and City of Solana Beach landscaped areas.

Figure 5. AWM IPC staff removing European sea lavender plants in Solana Beach landscaping along Highway 101.

Figure 6. European sea lavender seedlings in west basin of San Elijo Lagoon that were hand pulled.

Figure 7. Infestion of European sea lavender in Solana Beach landscaping along Highway 101 before removal by AWM IPC.

Figure 8. Area after the removal of European sea lavender plants by AWM IPC.

***Limonium ramosissimum* (Algerian sea lavender) Sites #1 and #5**

3.94 acres (50,000+ plants) were treated at site #1, located at Ocean Terrace off Cannon Road (Figures 9&10). This is a large site directly adjacent to Calaveras Reserve and above Agua Hedionda Lagoon (which holds large amounts of Algerian sea lavender). European sea lavender was also present at site #1 and was treated at the same time. Glyphosate (4%) was applied with backpack sprayers over 7 work days. One portion of the southern facing slope (0.81 acres) was not treated. The area has low vegetation coverage, and treating the plants would increase the probability of heavy erosion. In consideration of the threat of increased rainfall this winter, it was decided the area would be treated at a later date.

Site #5 along La Costa Avenue in Carlsbad (above Batiquitos Lagoon) was re-treated (Figure 11). This site is owned by the City of Carlsbad. About 1 acre was surveyed and re-treated twice during the quarter. Treatments of glyphosate (4%) were made using backpack sprayers over 2.5 work days.

Figure 9. Algerian sea lavender treatments at Site #1 off Cannon Road.

Figure 10. Foliar sprayed Algerian sea lavender at Site #1 off Cannon Road.

Figure 11. Algerian sea lavender treatments at Site #5 along La Costa Ave.

Retama monosperma (bridal broom): Sites #2, #3 & #6

At site #2 (Figure 12), a total of 7.72 acres were surveyed, and 0.12 acres (230 plants) were re-treated. Re-sprouts and seedlings were foliar sprayed with Garlon (tryclopyr). Site #3 (Creek View Lane) and Site # 6 (near 76) were also surveyed, but no re-growth was observed (Figure 12).

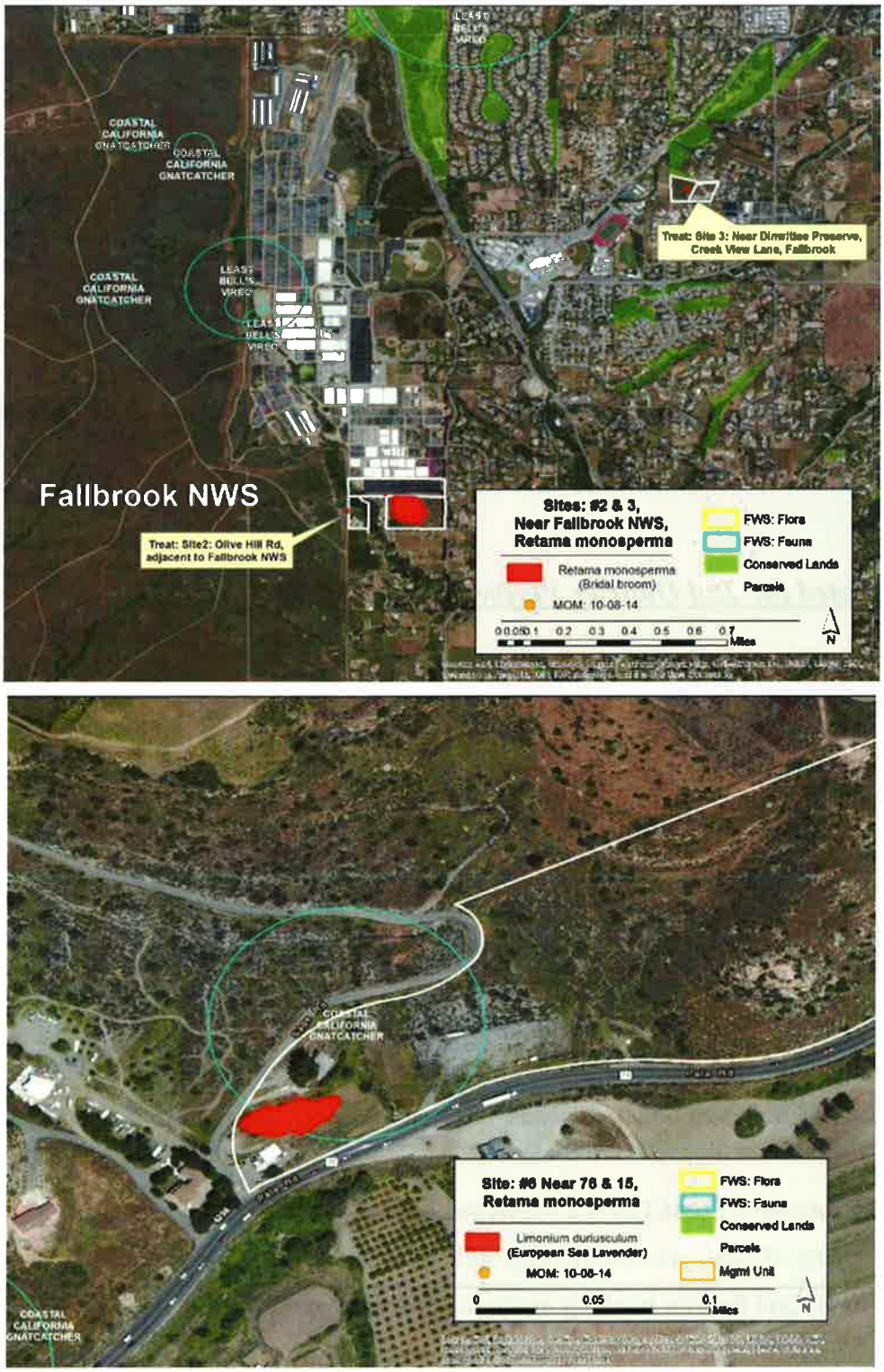

Figure 12. Bridal broom sites and treatments.

TASK 4 – AWM: Invasive Plant Level 3 Management.

Level of Effort: (<20%) of overall contract

- No charges during this quarter.

TASK 5 – Coordinator: Tracking and Updating Invasive Species for Priority Removal.

Level of Effort: (5%) of overall contract

- Presentations were made on the program by Jason Giessow at the monthly San Diego Management and Monitoring Program meeting on August 26, 2015, and to USFWS on August 3, 2015.
- Coordination with California State Parks (Darren Smith), CDFW (Warren Wong), Naval Weapons Station Seal Beach Detachment Fallbrook (Christy Wolf and Ryan Lockwood), and Camp Pendleton (Patrick McConnell) occurred on Early Detection Rapid Response implementation and priorities. Coordination with Caltrans (Kim Smith) will be initiated shortly.

Work Anticipated for 2nd Quarter Period, Oct 1, 2015 – Dec 31, 2015:

Task 1 – Invasive Plant Species Coordinator:

- Update work plan if needed.
- Coordinate ROE work with AWM, update database.
- Monitor and coordinate with AWM during implementation.
- Survey sites as needed.

Task 2 – AWM: Invasive Plant Level 1 Management.

- Survey, map, and treat any reported sightings of target Level 1 plants.
- Supervision of staff, provide training, guidance, and preparation for field work.
- Collect GIS points of targeted weeds, if found.

Task 3 – AWM: Invasive Plant Level 2 Management.

- Supervision of staff, provide training, guidance, and preparation for field work.
- Coordinate and finalize tracking methods for work completed.
- Initiate and continue work outlined in work plan.
- Obtain signed ROEs.
- Collect GIS points of targeted weeds.

Task 4 – AWM: Invasive Plant Level 3 Management.

- No work planned.

Task 5 – Coordinator: Tracking and Updating Invasive Species for Priority Removal.

- Continue coordination with Department of Defense, California Department of Parks and Recreation, and the Weed Management Area.
- Continue to aggregate data and track new prospective EDRR target species.
- Increase the number of EDRR identification sheets for priority species (for land managers and regional biologists).
- Presentation will be made on the program by Jason Giessow at the Cal-IPC Symposium October 29, 2015 in San Diego.