San Diego Association of Governments (SANDAG)
Memorandum of Understanding (MOU) #5004552
Strategic Removal of Invasive Weed Species
4th Quarter Report - FY 2014-15: Report #3 for Project
April 01, 2015 – June 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 complete 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 (SOW) 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) The first Year Work Plan was approved by SANDAG/SDMMP (Q2 2014-15). An updated version of the work plan was submitted with quarterly Q3 report. The updated version has additional *Limonium* (sea lavender) information and appendices with the final California Environmental Quality Act Notice of Exemption (CEQA NOE), and County Right-of-Entry (ROE) forms.

2) Property ownership/ROE database was updated for all sites. This database tracks ROE status for all species and sites being treated. Work on ROE agreements consumed a significant amount of time this quarter. Table 1 shows the ROE status by species, and Table 2 shows the ROE status by entity. The possible statuses are: Completed, Pending (awaiting signature), In Process (distributed), Rejected, and No Action (not sent out). Progress obtaining ROEs has occurred at sites for bridal broom and sea lavender. Progress on ROE agreements has been slow overall, as liability issues are being determined. It is expected that the County will sign ROE agreements offered by the City of San Diego and the Port District within the next few weeks. This process should become less onerous and time consuming once a standard procedure is outlined for the program.

3) The coordinator worked/monitored at nine field sites.

- Three bridal broom sites were visited multiple times (Fallbrook (2), Valley Center (1)). ROEs were obtained, mapping occurred, photos were taken. The coordinator worked with crews to initiate work at all three sites (access and logistics).

- Four sea lavender sites were surveyed and ROEs obtained/worked on (La Costa Ave, Ocean Terrace, and San Elijo). One site was treated (La Costa Ave). Ocean Terrace is ready for work (ROE completed, mapped, and HOA/landscape maintenance met with). The site will require minor replacement planting to minimize erosion as the sea lavender is on landscaped slopes that are erodible. This site is important as it is above Agua Hedionda, which is invaded with Algerian sea lavender. This could be a source population for these plants.

- The Balboa Park Canary Island St. John's wort site was visited to prepare for control once the City ROE process is completed.

- Ward's weed site at La Costa Greens was monitored. No live plants were observed.

4) Quarterly report was prepared.

Table 1. Summary of ROEs by species

Scientific Name	Common Name	Sites	Total ROEs	ROE Status				
				Completed	Pending	In Process	Rejected	No action
Ageratina adenophora	Eupatory	3	5	1	2	0	1	1
Carrichtera annua	Ward's weed	2	3	3	0	0	0	0
Centaurea solstitialis	yellow starthistle	12	29	19	0	0	0	10
Centaurea stoebe	spotted knapweed	1	2	2	0	0	0	0
Elymus caput-medusae	Medusahead	N/A	-	-	-	-	-	-
Genista monspessulana	French broom	3	3	1	2	0	0	0
Hypericum canariense	Canary Island St. John's wort	5	10	1	2	0	0	7
Iris pseudacorus	yellow flag iris	N/A	-	-	-	-	-	-
*Limonium duriusculum**	European sea lavender	3	3	2	1	0	0	0
*Limonium ramosissimum**	Algerian sea lavender	10	8	3	1	2	0	2
Lythrum salicaria	purple loosestrife	2	4	1	0	3	0	0
Retama monosperma	bridal broom	3	5	5	0	0	0	0

A major focus of building capacity for Early Detection Rapid Response (EDRR) work has been obtaining access to large entities that manage lands with multiple EDRR sites or significant acreage where EDRR targets are likely to be found.

Table 2. Summary of ROEs by entity (public agencies or large landholders/programs)

Entity	Type of agreement	Length of agreement	Status	Breadth of agreement	CEQA needed (requested)
County of San Diego*	Implicit (automatic: AWM is County of SD)	Continuous	Complete	All lands	Yes
City of San Diego	City ROE (Right of Entry)	3 Years	In Process	All open space and park lands	Yes
City of San Diego	TAP (Temp Access Permit)	1 Year	Complete	Lake Murray	Yes
City of San Diego	City ROE (Right of Entry)	3 Year	In Process	Public Works Lands	Yes
Unified Port of San Diego	Unified Port of San Diego ROE	2 Years?	In process	Chula Vista NR	Yes
California Department of Fish and Wildlife (CADFW)	CADFW ROE	Continuous	Complete	North County estuaries	Yes
Sweetwater Authority	Sweetwater Authority ROE	2 years?	In process	Sweetwater Eupatory site	Yes
City of Carlsbad: Parks Department	AWM ROE	Continuous	Complete	Ward's weed site	No
City of Carlsbad: Roads Department	AWM ROE	Continuous	Complete	sea lavender site	No
Caltrans	Making determination	Pending determination	In process	Three sites	Yes
California Department of Parks & Recreation	Making determination	Pending determination	In process	N/A	Yes
Various private properties: 7	AWM ROE	Continuous	Complete	bridal broom (4), yellow starthistle (2) and sea lavender sites (1)	No

*Includes parks, open space, and roads.
**Includes parks, and open space.

TASK 2 – AWM: Invasive Plant Level 1 Management.

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

- No charges during this quarter.

TASK 3 – AWM: Invasive Plant Level 2 Management.

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

The Department of Agriculture, Weights and Measures Integrated Pest Control Program (IPC) surveyed, treated, and manually removed six invasive weed species this quarter: Ward's weed, yellow starthistle, spotted knapweed, French broom, Algerian sea lavender, and bridal broom. Additional preparation work occurred for three bridal broom sites. IPC made optimal pesticide applications, and protected the natural environment by preventing off-site movement of pesticides. IPC utilized BMPs that prevented unintentional discharges to surface waters. Additionally IPC hired a student worker to assist with the collection of GIS data, update and create maps as well as photograph areas.

For each site, 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 toxic pesticide that effectively mitigates the target pest.

Table 3. Summary of treatments performed by AWM this quarter

Scientific Name	Common Name	# of Sites Worked	Acres Surveyed	Acres Treated	Plants treated
Carrichtera annua	Ward's weed	2	30	11.7	4,000+
Centaurea solstitialis	yellow starthistle	4	81.3	Manual removal	470+
Centaurea stoebe	spotted knapweed	1	14	Manual Removal	27
Genista monspessulana	French broom	1	15	4.4	2000+
Limonium ramosissimum	Algerian sea lavender	3	4.0	3.31	10,000+
Retama monosperma	bridal broom	3	5	3	1,000+

***Carrichtera annua*, Ward's weed: Sites #1 & #2**

Ward's weed sites #1 & #2 are located on 3 parcels of land owned by La Costa Greens HOA, Center for Natural Lands Management (CNLM), and the City of Carlsbad. Plants were found to be extensive and widely spread over CNLM and La Costa Greens HOA property, and patchy on the City of Carlsbad property. IPC manually removed over 4,000 plants with viable seed on all three properties ensuring the seed bank was removed, and bagged and disposed the biomass in a landfill. In addition, IPC treated an additional 7.7 acres with Roundup Pro Concentrate and 4 acres with Telar XP (pre-emergent).

Pre and post treatment photos of Ward's weed at a La Costa Greens HOA Site.

4-1-15 – Original infestation.

6-9-15 – Post Treatment.

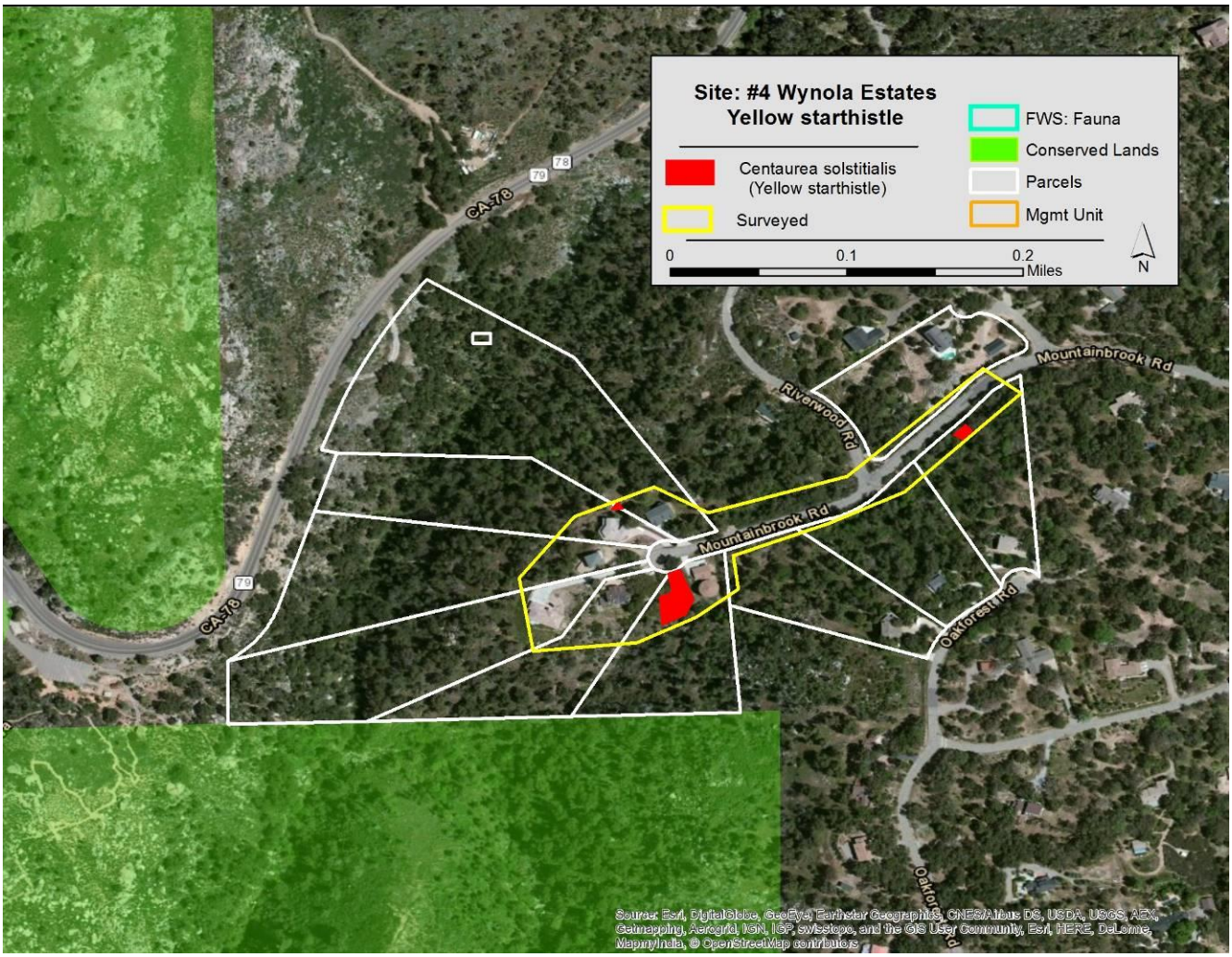
6-9-15 – Post treatment close up.

***Centaurea solstitialis*, Yellow Starthistle: 4 sites**

Table 4. Yellow starthistle treatments performed by AWM this quarter

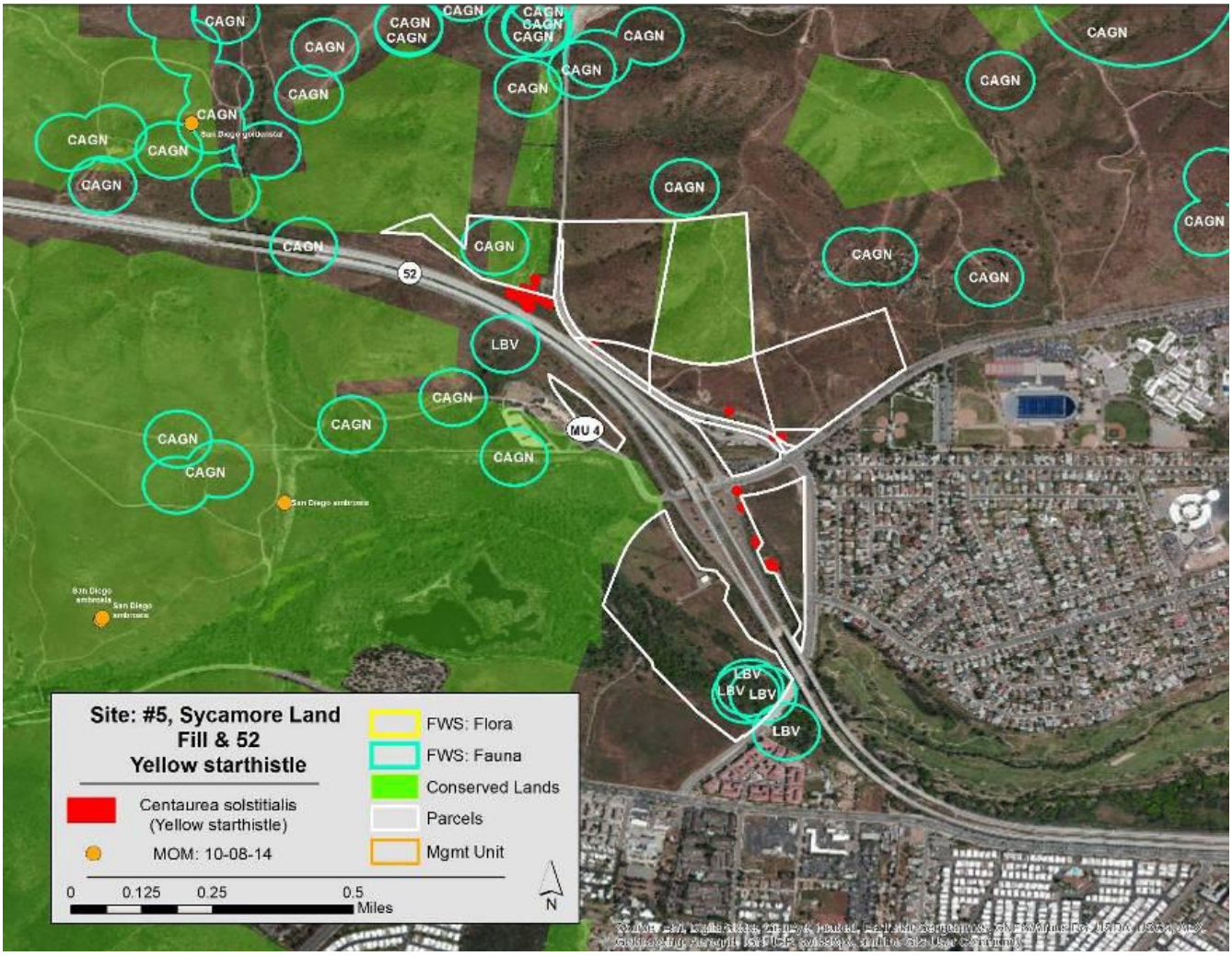
#	Location	Area Surveyed	Amount Treated	Action	Property ownership	Funding
4	Wynola Estates, Wynola	6.7 acres	28 plants	Manually Removed	10 Private	CDFA
5	SR-52 and Sycamore Landfill	15.8 acres	4 plants	Manually Removed	City SD, 5 private	EMP
8	Mendenhall Valley, Palomar Mtn	35.7 acres	436 plants	Manually Removed	2 Private	EMP
16	Mesa Grande	23.1 acres	2 plants	Manually Removed	3 Private	CDFA

Yellow starthistle at site #4 in Wynola Estates was surveyed. 28 Plants were manually removed by IPC staff within a 6.7 acre area.



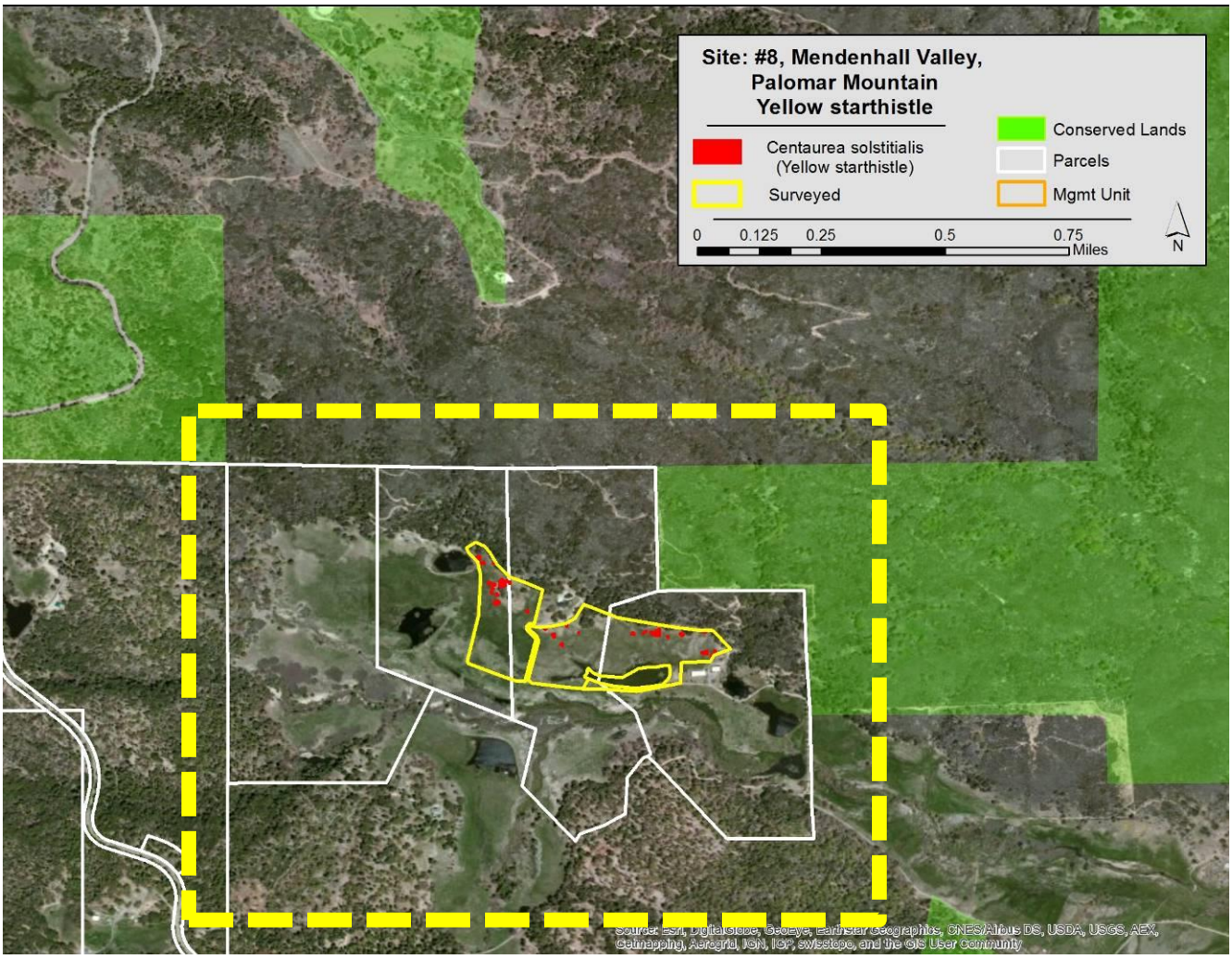
Yellow starthistle being removed at site #4 'Wynola Estates' by an IPC worker.

Yellow starthistle site #5 at the Sycamore Landfill and Radio towers was surveyed. This site is close to the coast so early surveys were completed due to the warmer than normal conditions. IPC staff surveyed 15.8 acres, finding and manually removing 4 plants.



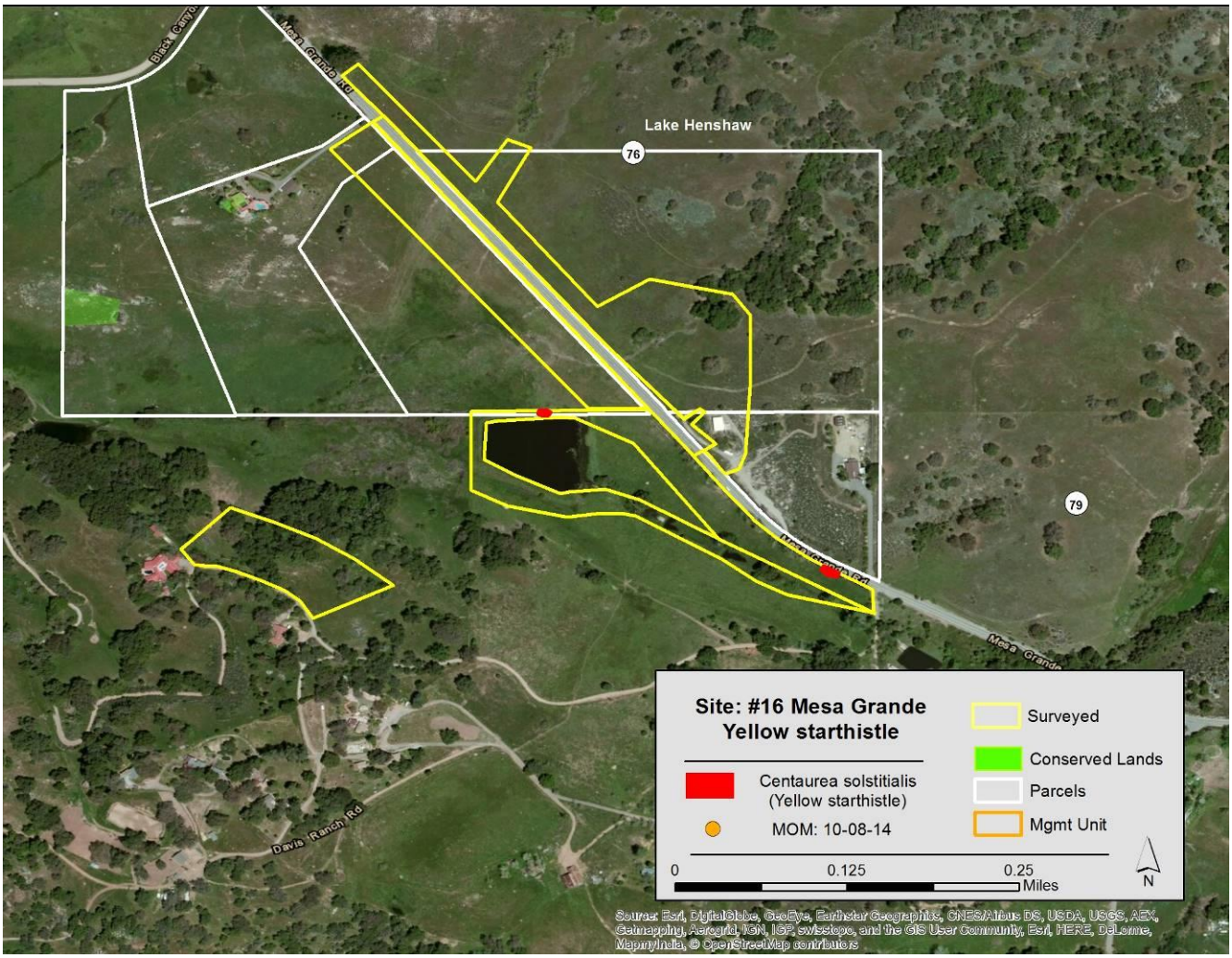
IPC workers surveying and treating yellow starthistle at site #5, 'Sycamore Landfill.'

Yellow starthistle site #8 at Mendenhall Valley on Palomar Mountain was surveyed. 436 plants were manually removed by IPC staff within a 35.7 acre area, on south and southwest facing slopes. While on site, another landowner requested his property be surveyed for yellow starthistle.



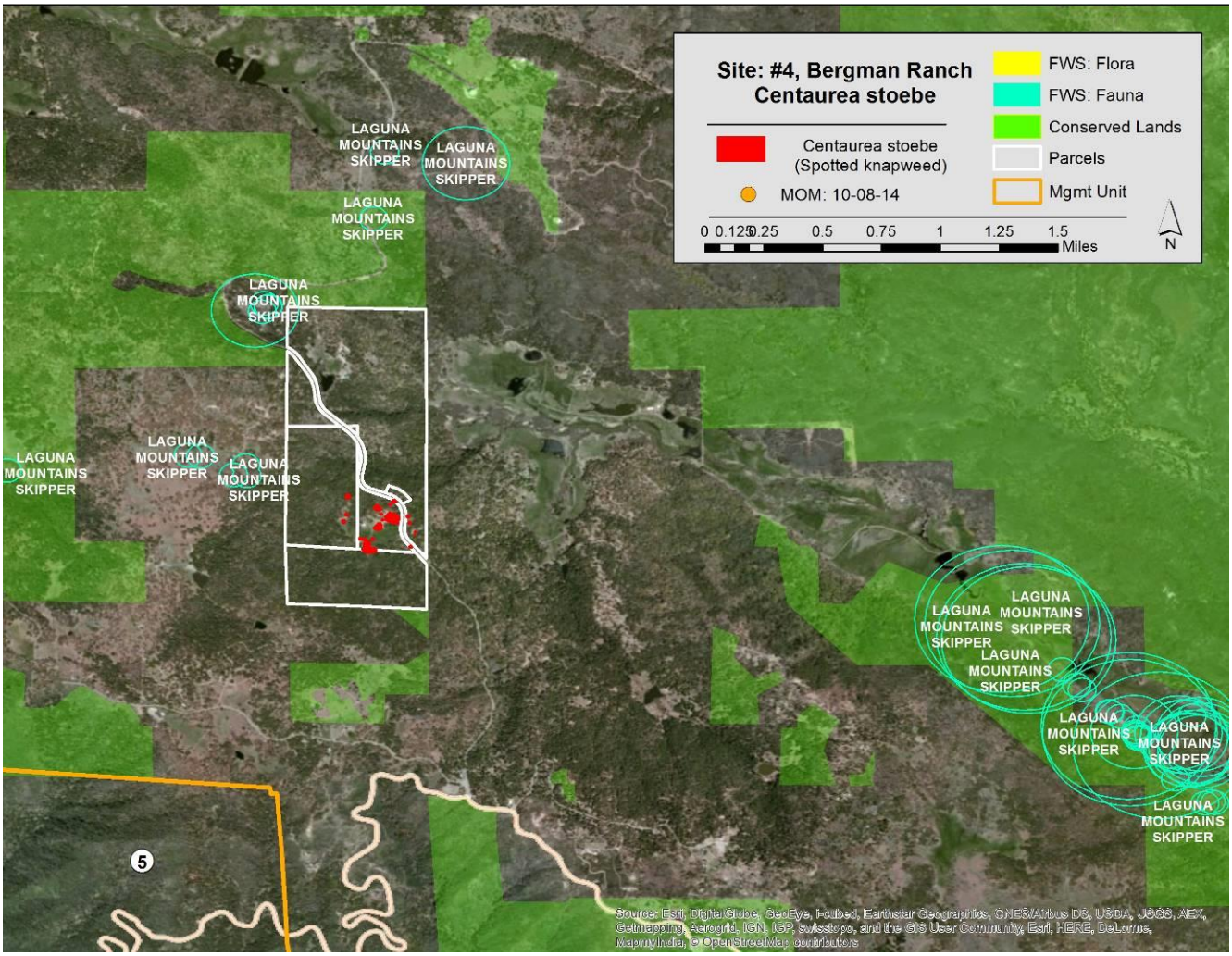
IPC workers manually removing yellow starthistle at site #8 ‘Mendenhall Valley,’ Palomar Mtn.

Yellow Star Thistle site #16 at Mesa Grande was surveyed. IPC staff found and manually removed 2 plants at this site, having surveyed 23.1 acres.



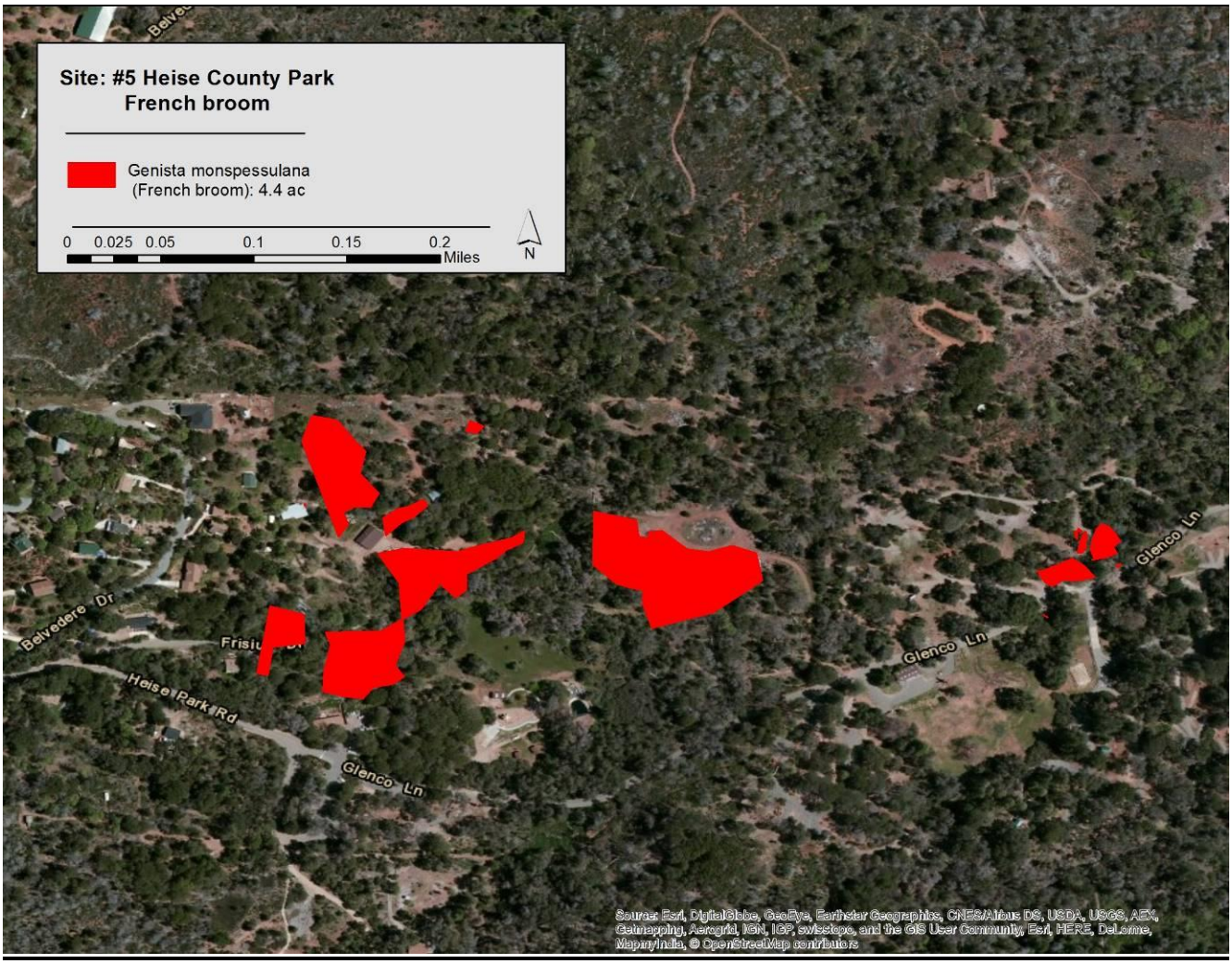
***Centaurea stoebe*, spotted knapweed: Sites #1**

Centaurea stoebe, spotted knapweed at Bergman Ranch in Palomar Mountain was treated. A total area of 14 acres was surveyed. A total of 27 plants were removed from this site.



***Genista monspessulana* (French broom): Site #5**

Genista monspessulana (French broom) at Heise County Park in Julian was treated. A total area of 15 acres was surveyed and 4.4 acres were treated. Plants were cut and hauled off, or sprayed with herbicide. This work required a total of 16 visits to the park.



French broom pre spot spray treatment (above) and post spray treatment (below).

***Limonium ramosissimum*, Algerian sea lavender Site #5**

Algerian sea lavender site #5 along La Costa Avenue in Carlsbad (above Batiquitos Lagoon) was surveyed and treated. This site is owned by the City of Carlsbad. About 4 acres were surveyed along the road, and 3.31 acres were treated. The herbicide treatment was 3% glyphosate and 1% Imazapyr. Application was made with backpacks. The areas was posted because it was accessible, and along a roadway. Plants were dense to scattered, mature plants were in flower and seedlings were abundant.

IPC worker documents spot treatment of Algerian sea lavender.

Algerian sea lavender plants were small and covered a large area.

- Two additional Algerian sea lavender sites were surveyed and ROEs obtained/worked on (Ocean Terrace, and San Elijo). Ocean Terrace is ready for work (ROE completed, mapped, and HOA/landscape maintenance consulted). The site will require minor replacement planting to minimize erosion as the sea lavender is on landscaped slopes that are erodible. This site is important because it is above Agua Hedionda, which is invaded with Algerian sea lavender. This could be a source population for these plants.

Sea lavender in Ocean Terrace HOA area.

Sea lavender seedlings at Ocean Terrace HOA site.

The San Elijo site was monitored (treatment efficacy was fair, about 60%). New treatments will be with higher concentrations of glyphosate. Two source populations above the 'west basin' European sea lavender site have been newly identified and mapped. Both are in landscaping (a car wash facility and City of Solana Beach). ROEs will be obtained and sites treated.

European sea lavender in City of Solana Beach landscaping, above San Elijo Lagoon.

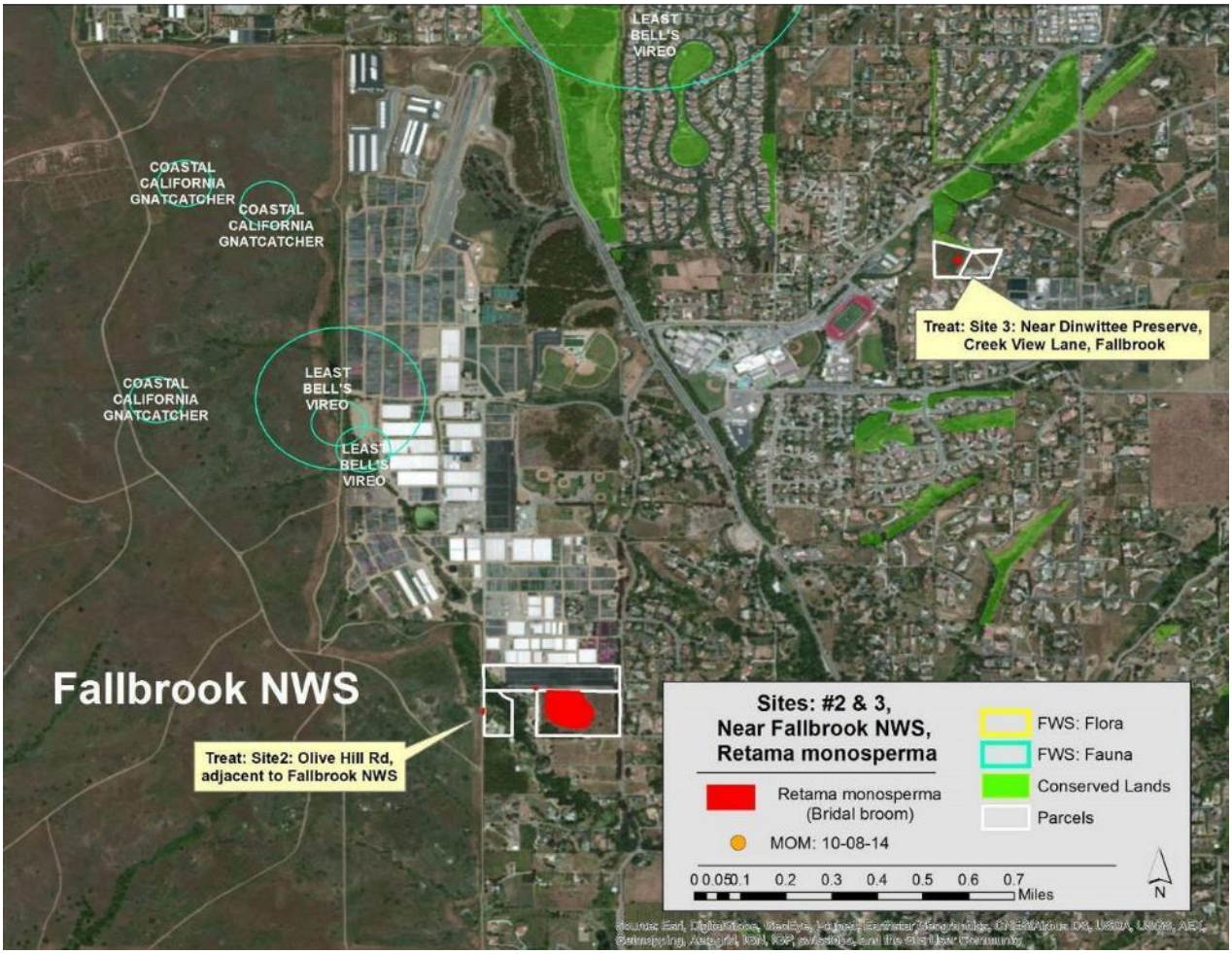
The San Diego River estuary European sea lavender site was visited to assess whether it can co-occur with the listed salt marsh bird's beak. The site does have areas where both species are intermixed.

Salt march bird's beak co-occurring with European sea lavender at San Diego River Estuary.

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

Retama monosperma (bridal broom) at Olive Hill Road in Fallbrook (site #2) was treated. A total of 3 acres were surveyed, and 1.0 acre was treated. Large plants were cut, stumps were treated with Garlon 4 (tryclopyr), and seedlings were foliar sprayed. Imazapyr was used as a pre-emergent in selected areas (where biomass was staged or at the base of large shrubs). Biomass disposed of at a landfill (not green waste).

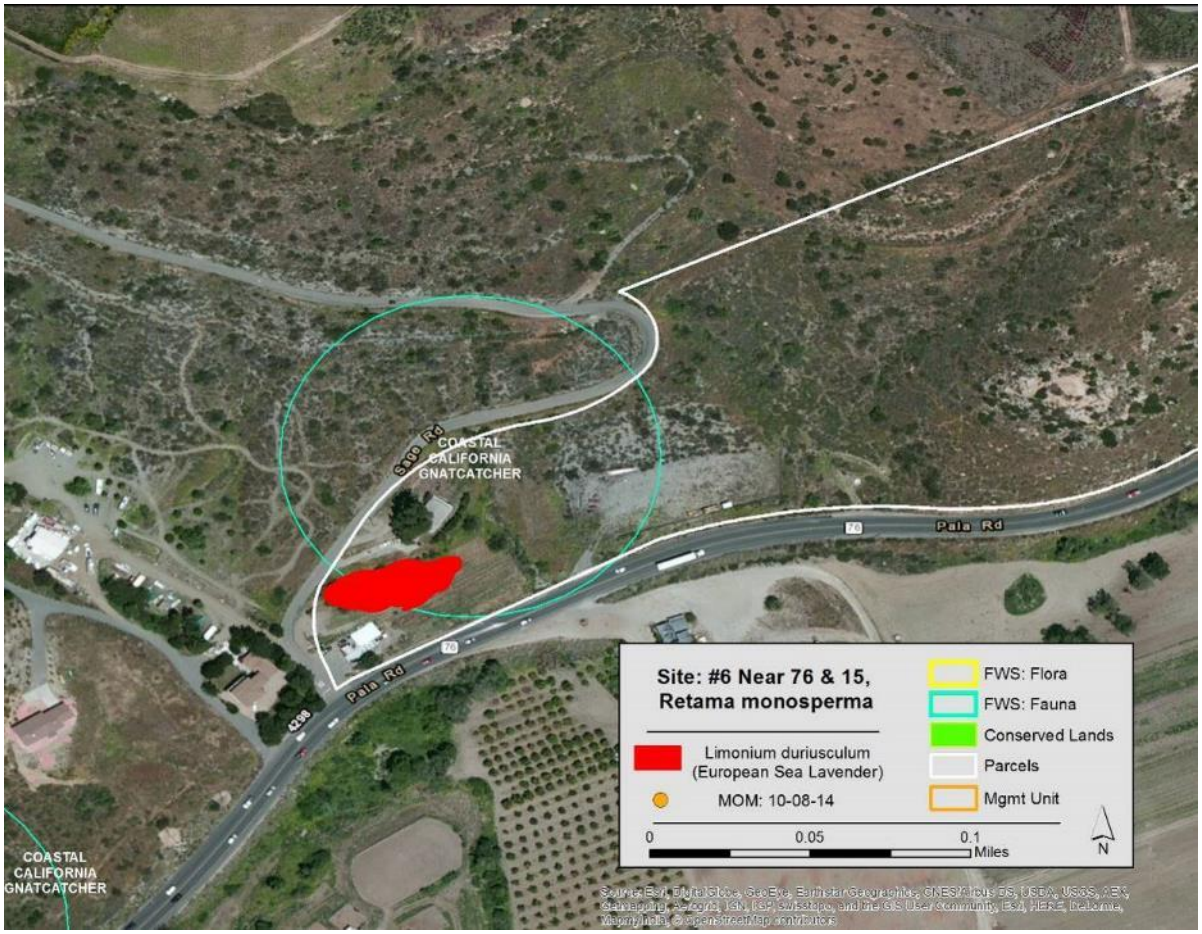
Retama monosperma, Bridal broom at Creek View Lane in Fallbrook was treated (site #3). A total of 1 acre was surveyed, and 4 large shrubs were treated. Plants were cut, and stumps were treated with Garlon 4 (tryclopyr). Imazapyr was used as a pre-emergent in selected areas (where biomass was staged or at the base of large shrubs). Biomass disposed of at a landfill (not green waste).

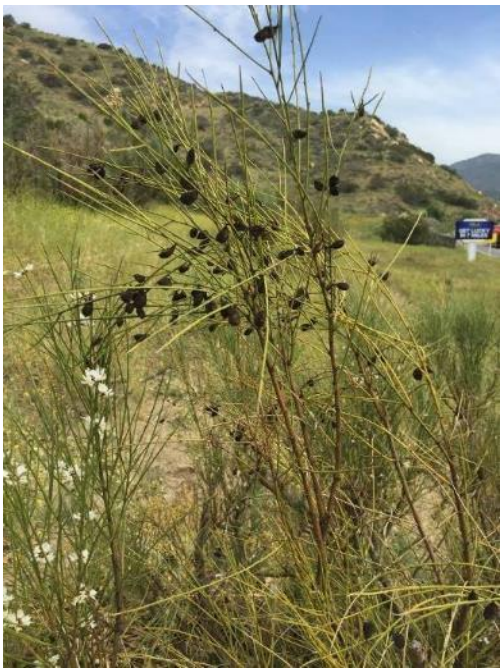





The two top photos depict before and after treatment of bridal broom bordering the Fallbrook Naval Weapons Station. The bottom photos show thick bridal broom growths before and during treatment at the same site, #2 'Olive Hill Road.'

Retama monosperma, bridal broom at 76 and I-15 near Fallbrook was treated (site #6). A total of 1 acre was surveyed and 30 large shrubs were treated. Plants were cut, and stumps were treated with garlon (tryclopyr). Biomass disposed of at a landfill (not green waste) due to the presence of viable seeds. Follow-up visits will be conducted to treat sprouting bridal broom plants.





bridal broom at site #6 (left), 'near the 76 & 15 freeways,' show viable seed production (right).

Above, IPC workers cut bridal broom down to stump at site #6, near the 76 & 15 freeways. Post herbicide treatment of the cut stumps are shown in the lower photo.

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

- Co-ordination with State Parks (Darren Smith), Naval Weapons Station Seal Beach Detachment Fallbrook (Christy Wolf and Ryan Lockwood), and Camp Pendleton (Patrick McConnell) occurred on EDRR implementation and priorities. Co-ordination with Caltrans (Kim Smith) will be initiated shortly.
- Presentation to San Diego Weed Management Area (SDWMA) on program (6-30-15).

Work Anticipated for 4th Quarter Period, July 1, 2015 – September 30, 2015:

Task 1 – Invasive Plant Species Coordinator:

- Update work plan if needed.
- Coordinate ROE work with AWM, update database.

  Caltrans and State Parks will be specifically worked on, along with other ROEs for scattered sites.
- 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.

  Euphorbia terracena (carnation spurge) has been found on a tributary of Los Penasquitos Canyon. This site will be mapped and treated.
- 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, CDFW, and Weed Management Area. Initiate coordination with Caltrans.
- Continue to aggregate data and track new prospective EDRR target species.
- Presentations will be made on the program by Jason Giessow at: 1) the monthly San Diego Management and Monitoring Program meeting on August 26, 2015, and 2) USFWS on August 3, 2015.