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

Strategic Removal of Invasive Weed Species
1st Quarter Report - FY 2019-20: Report #20 for Project

October 1st, 2019 – December 31st, 2019

Project: County of San Diego, Department of Agriculture, Weights & Measures (AWM), Integrated Pest Control Program (IPC)
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 San Diego Association of Governments(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 Invasive Plant Strategic Plan (IPSP)P 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:

This quarterly report covers work funded through the SANDAG Contract, which allowed work to occur from October 1st 2019 to December 31st 2019.

TASK 1 – Invasive Plant Species Coordinator:

Level of Effort: (25%) of overall contract

Right of Entry (ROE) Work and Coordination With Property Owners:

Coordination with property owners, land managers and AWM crew occurred throughout the quarter. New ROE agreements were obtained for two new large sites: Ward's weed at Bressi Ranch and Barbed goatgrass at Lake Cuyamaca. Both sites currently have 100% access for control work. The City of Chula Vista also completed an entry agreement allowing three Algerian sea lavender sites to be treated for the first time.

The coordinator worked on primarily on two species at two large field sites:

Work tasks included working with field crews, assessing treatment success, and pre-mapping and surveying target plants. Work focused on initiating work at two new large sites. The Ward's weed site in the City of Carlsbad (Bressi Ranch) required coordination with multiple city staff and partners, including coordination on temporarily closing trails in the treatment area. Treated plants were monitored to assess if the pre-emergent was effective when plants were beyond cotyledon growth stage. Efficacy is very high through the second set of true leaves. Once plants grow beyond this stage, especially if they start to bolt and flower, efficacy drops off. The addition of Milestone was found to boost efficacy, but this can only be used in grasslands and disturbed areas (no shrub cover). Barbed goatgrass treatments required coordinating with State Parks, CalFire, and private landowners. Species and sites are presented under task 2 and 3.

Regulatory permits:

CEQA NOE documents were updated with a wider range of herbicides. New CDFA funded work on Early Detection Rapid Response (EDRR) targets also has separate CEQA NOE's covering Ward's weed, Barbed goat grass, Desert knapweed and Spotted knapweed.

Report preparation:

The quarterly report was prepared.

Mapping and occurrence data:

Mapping and surveying for Ward's weed and Barbed goatgrass occurred.

Work plan:

No new work.

TASK 2 – AWM: Invasive Plant Level 1 Management

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

Level 1 Management Species are EDRR targets that were **not known to occur** in the county when the IPSP was written (2012).

Crews surveyed and treated, one invasive weed species (Barbed goatgrass) at one sites this quarter. Maps for sites show treated areas (red polygons) and surveyed areas as white lines which track pathways used by crews to survey and control plants. AWM IPC carried out optimal plant control, either hand polling or using 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 1. Summary of treatments performed by AWM on Level 1 species this quarter.

Scientific Name	Common Name	# of Sites Worked	Acres Treated	Acres Surveyed	Plants Controlled
Aegilops triuncialis	Barbed goatgrass	1	6.3	7.1	>100,000

***Aegilops triuncialis (Barbed goatgrass*):**

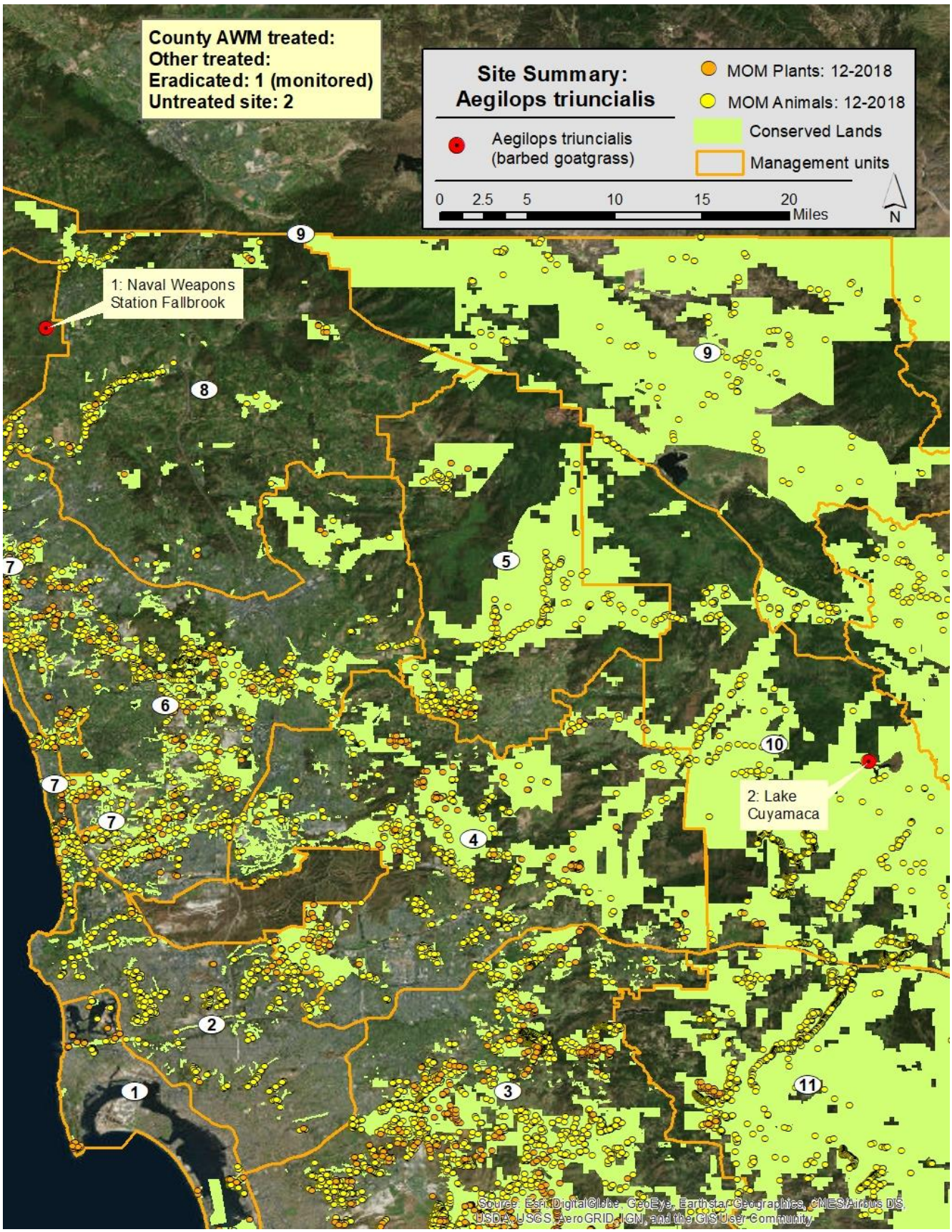
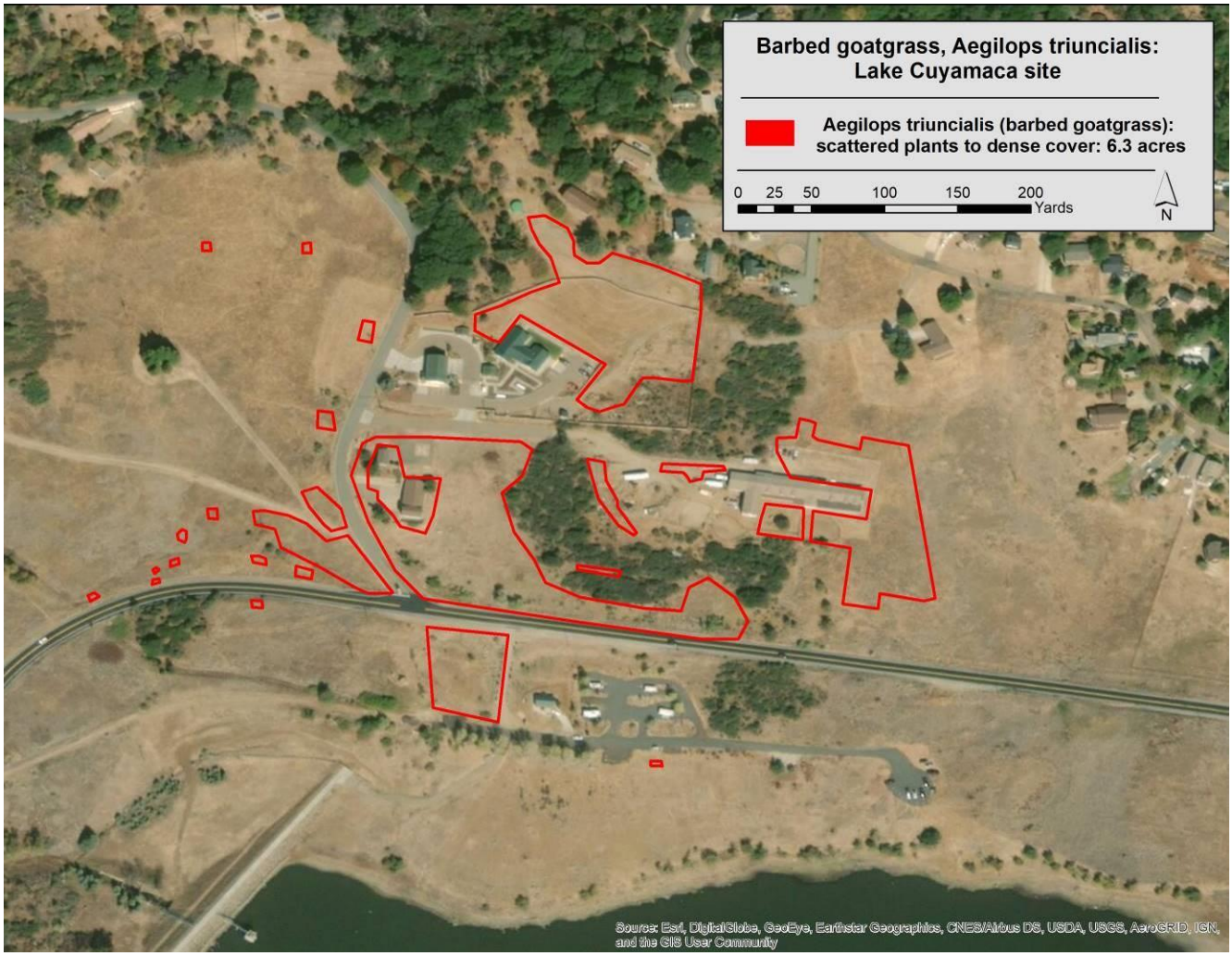


Table 2. Summary of treatments performed by AWM on *Aegilops triuncialis (barbed goatgrass*).

Work Site	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants Controlled
Site #2 Lake Cuyamaca	Barbed goatgrass	1	6.3	7.1	>200,000

***Aegilops triuncialis (Barbed goatgrass*): Site #2 Lake Cuyamaca**

California Department of Food and Agriculture (CDFA) grant has provided funding for two years (2019 and 2020) to start control of this high priority EDRR target that was discovered in summer 2018. This is the only known active site in the county, the Fallbrook site is considered eradicated. All seven property owners granted permission for work, including State Parks. A work crew of 5 to 2 individuals treated 6.3 acres over five days in November. A split application (fall and spring application at a lower rate) using Method herbicide was used. The second application was completed in January 2019. Control is supposed to be over 99% for barbed goat grass, while leaving other grasses. A January site visit did not show this level of control, it is possible that the rate used was too low. A late spring visit will give further information.



Dense patch of Barbed goatgrass, 2019.

2019 Treatment, some plants still holding seed, but uncommon.

2019 Treatment, dense cover of Barbed goatgrass, all seed dropped.

Barbed goatgrass germinating,1-20-2020. Second treatment was the following week.

TASK 3 – AWM: Invasive Plant Level 2 Management.

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

Level 2 Management Species are EDRR targets that were of limited distribution in the county when the IPSP was written (2012).

Crews surveyed and treated five invasive weed species (Eupatory, Ward's weed, French broom, European sea lavender and Algerian sea lavender) at nine sites this quarter. 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 Treated	Acres Surveyed	Plants Controlled
Ageritina adenophora	Eupatory	2	1.4	2.9	2,250
Carrichtera annua	Ward's weed	1	23.3	23.3	>500,000
Genista monspessulana	French broom	2	0.9	2.3	2,630
Limonium duriusculum	European sea lavender	1	0.2	1.0	800
Limonium ramosissimum	Algerian sea lavender	3	3.6	5.7	38,050

***Ageritina adenophora*, Eupatory:**

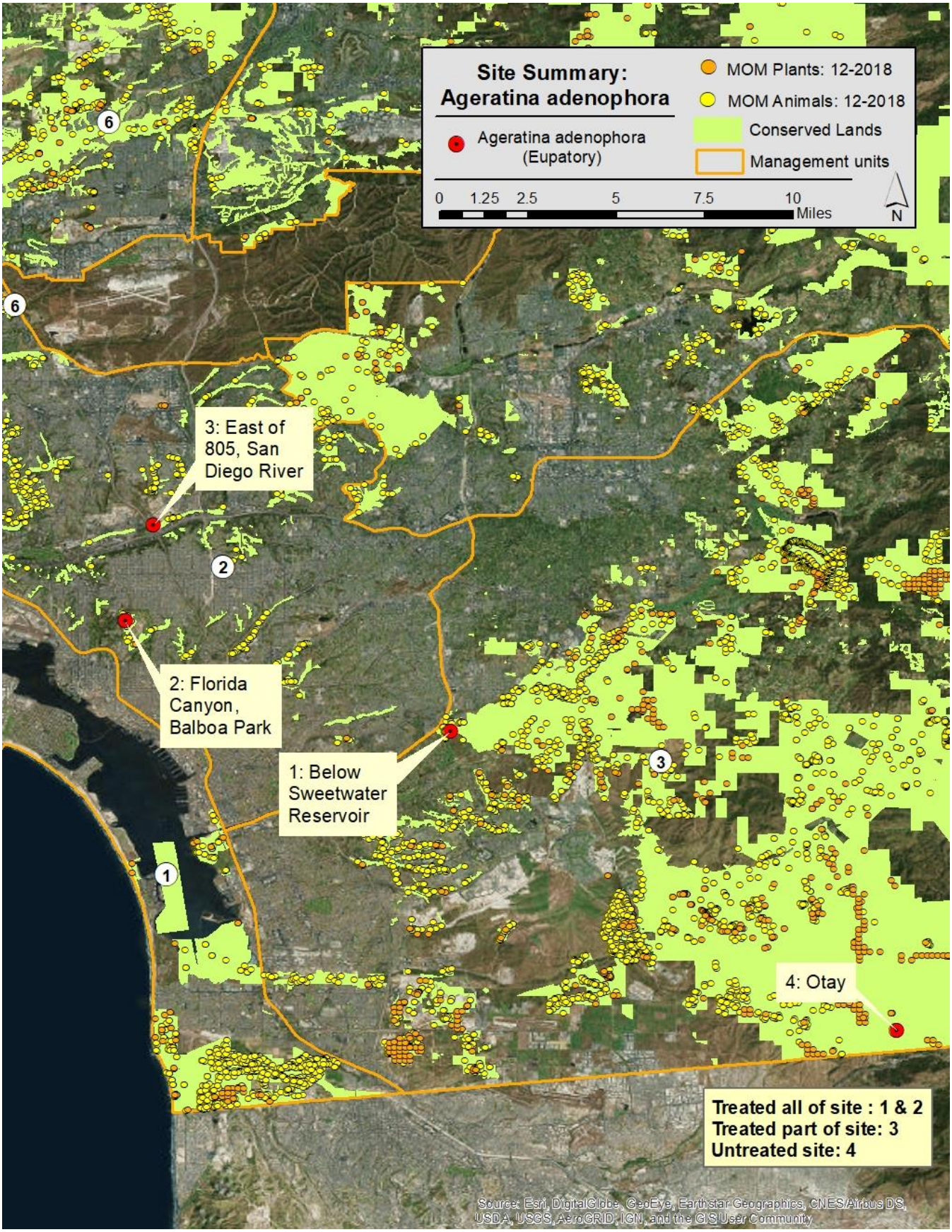


Table 4. Summary of treatments performed by AWM on *Ageratina adenophora,* Eupatory:

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #1: Sweetwater Authority	Eupatory	1	0.4	1.1	900

900 plants were foliar treated with glyphosate/imazapyr (70% re-sprouts/30% seedlings). A crew of two individuals worked two days on 10-4-2019 and 10-5- 2019.

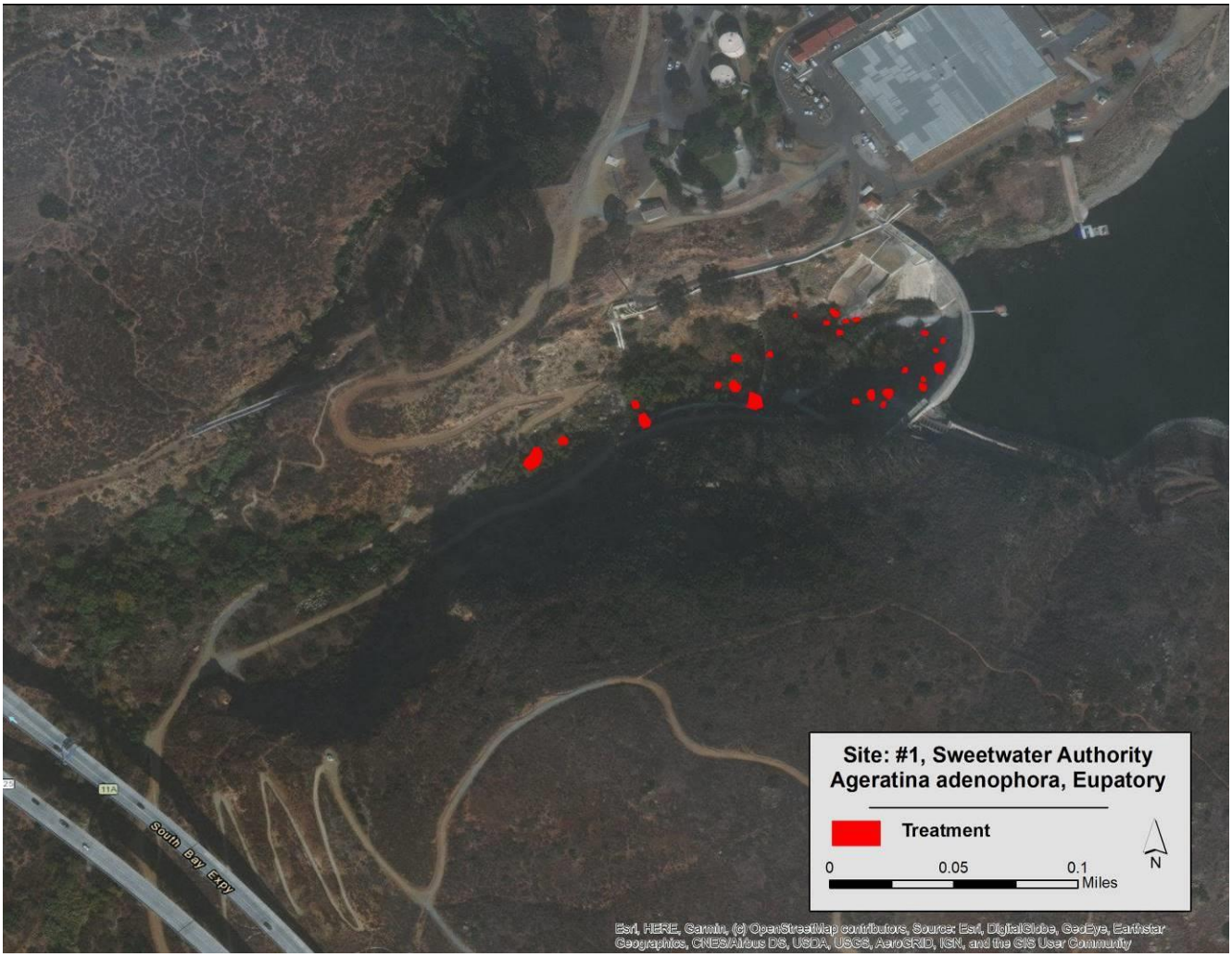


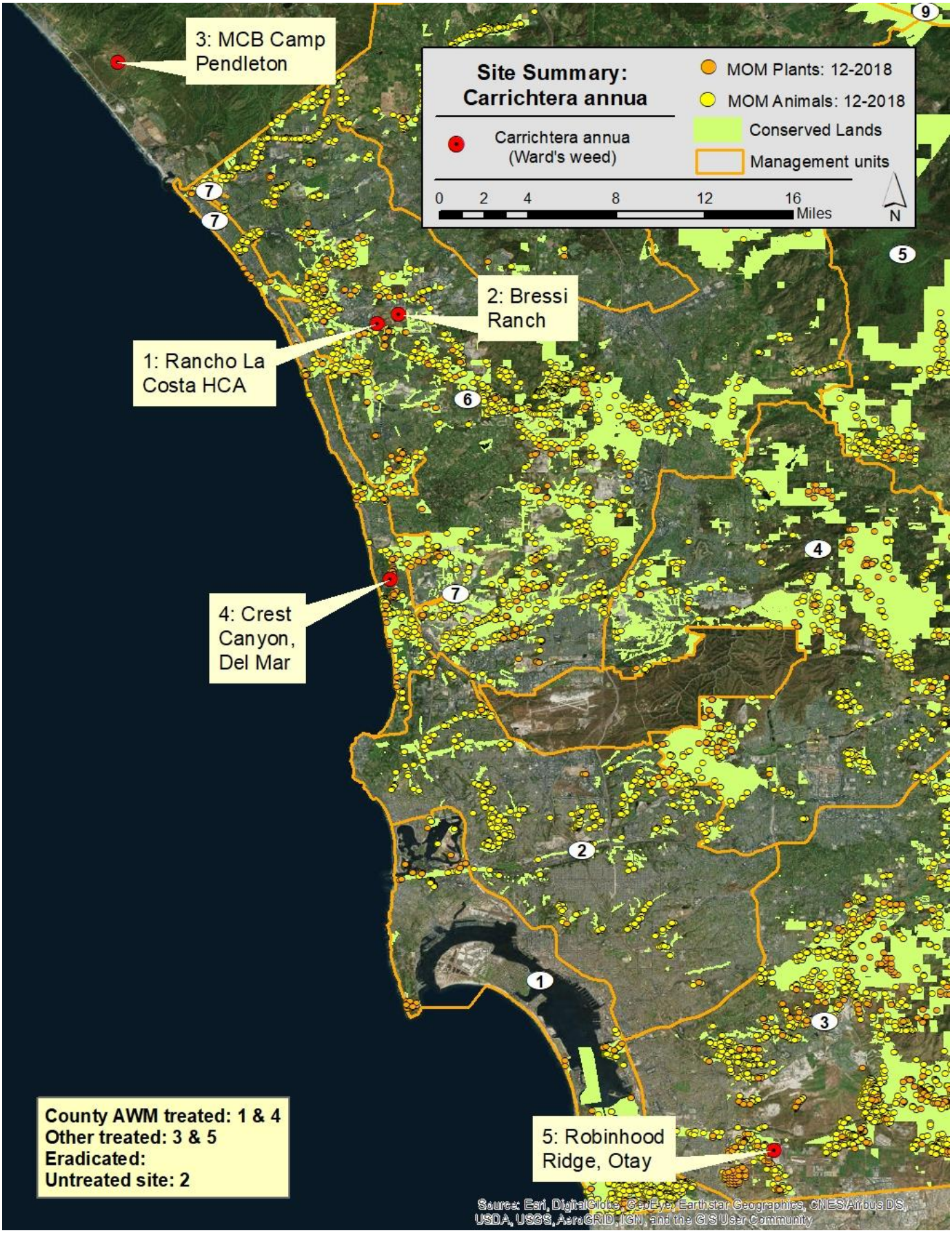
Table 5. Summary of treatments performed by AWM on *Ageratina adenophora,* Eupatory:

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #2: Balboa Park	Eupatory	1	1.0	1.8	1,350

1,350 plants were foliar treated with glyphosate/imazapyr (90% re-sprouts/10% seedlings). A crew of two individuals worked two days on 10-7-2019 and 10-8-2019.


Myrtle Ave
Upas St
Morley Field Dr
Park Blvd
Florida Dr
Alabama St
Jacaranda Dr
Zoo Dr
Village Pl
Old Globe Way
Florida Canyon Tr
Pershing Dr
Site #2, Balboa Park
Ageratina adenophora, Eupatory
Treatment
0 0.05 0.1 0.2
Miles
N
Esri, HERE, Garmin, (c) OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

***Carrichtera annua*, Ward's Weed:**



***Carrichtera annua*, Ward's Weed, Site #2 Bressi Ranch**

Table 6. Summary of treatments performed by AWM on *Carrichtera annua*, Ward's weed.

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #2 Bressi Ranch, Carlsbad	Wards weed	1	23.3	23.3	Pre-emergent: >500,000

The Bressi Ranch in the City of Carlsbad Ward's weed site is a very large site (>100 acres) covering multiple hillsides with many property owners. A collaboration has started work on the site: City of Carlsbad and The Nature Collective are working on the northern and western portions of the site and County AWM has started on the southern and eastern portions of the site. Center for Natural Land Management is taking the lead on the eastern La Costa Greens site. A pre-emergent herbicide (Gallery SC) was applied to the site. County AWM crews spent 25 days in November, December and January treating the area. A large crew was used to manage spray lines, treat the area, and manage trail closures during treatment work. The project required extensive coordination with the City of Carlsbad and partners. Early rains in November complicated treatments. Plants were already emerging by early December and were quite large by late December. Pre-emergent herbicides work best on plants at cotyledon stage, the Ward's weed plants were well beyond this growth stage for part of the treatment work. Close monitoring established that Wards's weed is extremely sensitive to Gallery SC herbicide. Plants with up to two sets of leaves were still being controlled at 100%. This is extremely fortunate as it extends the work window. The far eastern canyon was purposely treated very late (January 7-13) to test how far the treatment season can be pushed (see photos below). These plants were into third and fourth sets of leaves. Gallery SC was still effective, but not at 100%, closer to 80%. Milestone Herbicide was added to the treatment mix for the western portion of the site. Adding this pre/post emergent was very effective, 100% control was achieved. Milestone cannot be used in shrublands areas, however, so it extends treatment by time but only for grassland treatment areas.

Full control of Wards weed plants using Gallery and Milestone late in season (treatment early January, photo late February).

Partial control of Ward's weed using just Gallery SC late in season (treatment January 2020, photo late February 2020). (Ward's weed is thin upright plant with few leaves)

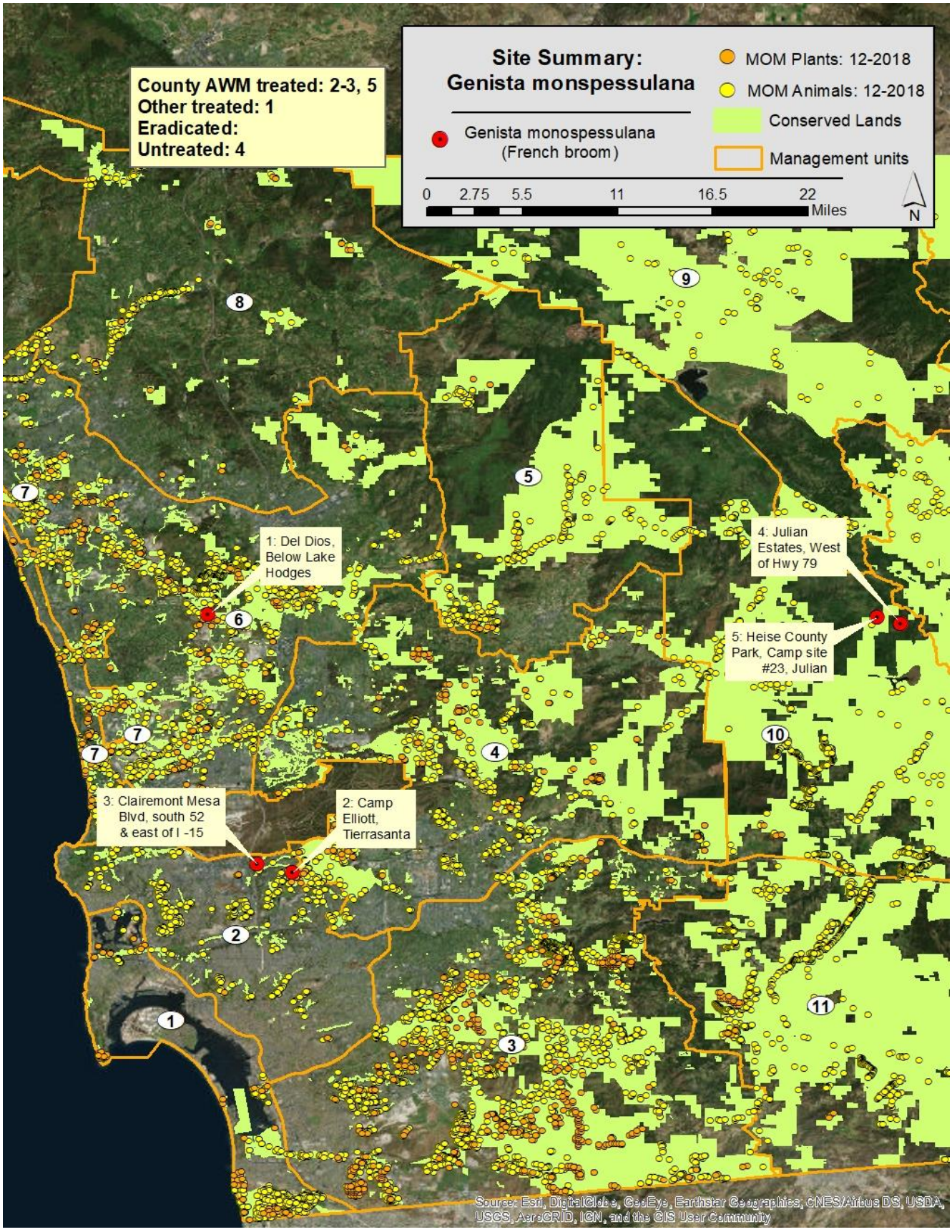
***Carrichtera annua*, Ward's weed, Site #4 Crest Canyon, Del Mar**

Table 7. Summary of treatments performed by AWM on *Carrichtera annua*, Ward's weed.

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #4, Crest Canyon, Del Mar	Wards weed	1	0.8	0.8	5,500

This site was treated for the first time with Gallery SC pre-emergent herbicide by a crew of three on December 6th, 2019 (The site did have an early summer post emergent treatment in 2019, to stop plants from adding to the seedbank). Plants in December were at the seedling stage, but still at first and second leaf set stage. A site visit in January indicated very good control, no live Ward's weed plants were observed in a late December site visit.

***Genista monspessulana*, French broom:**



***Genista monspessulana*, French broom: Site #3 Clairemont Mesa Blvd.**

Table 8. Summary of treatments performed by AWM on *Genista monspessulana*, French broom.

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #3 Clairemont Mesa	French broom	1	0.3	0.8	1,500

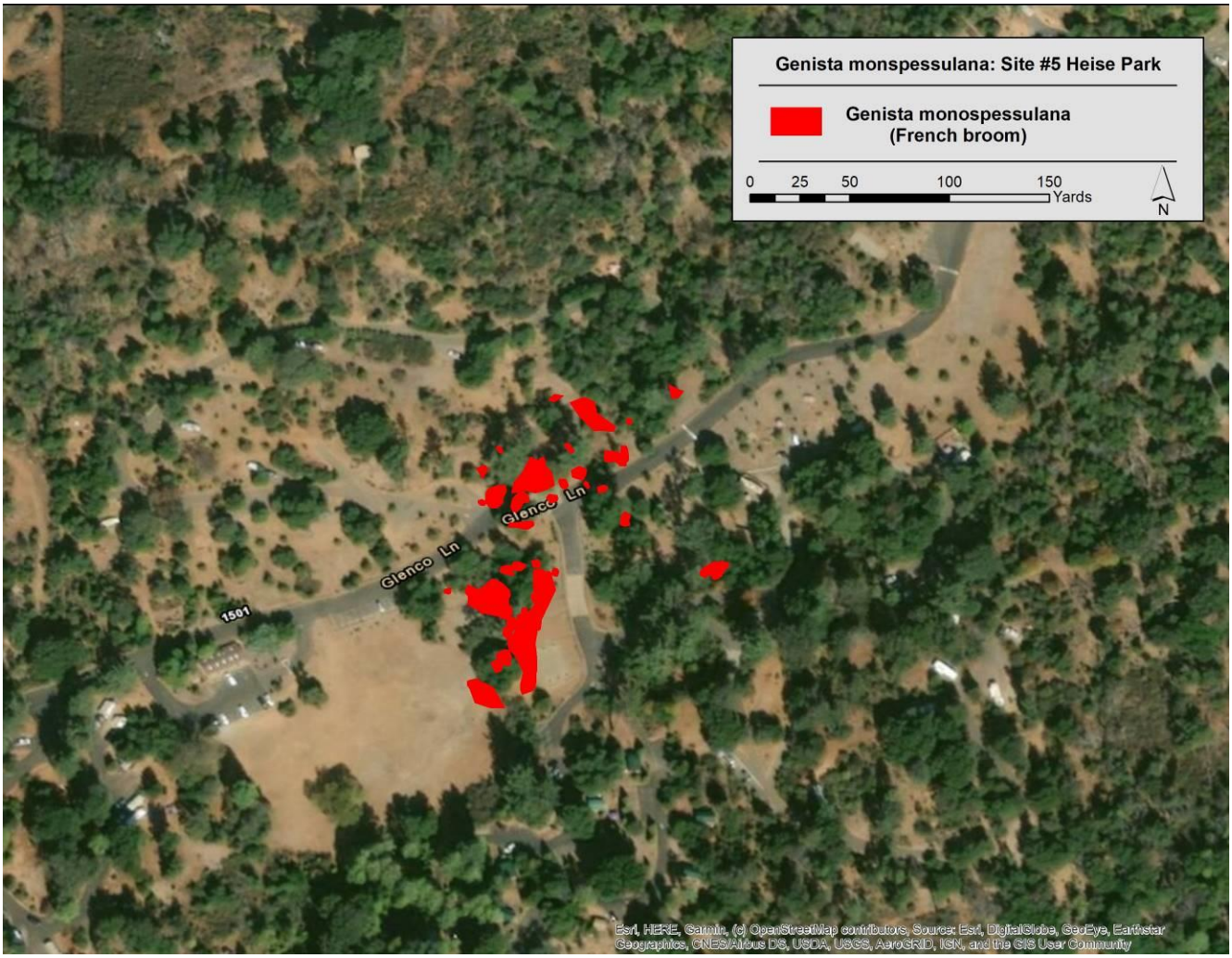
1,500 scattered seedlings were foliar treated with Triclopyr, no re-sprouts were seen. A crew of two individuals worked one day October 3rd 2019.

***Genista monspessulana*, French broom: Site #5 Heise Park.**

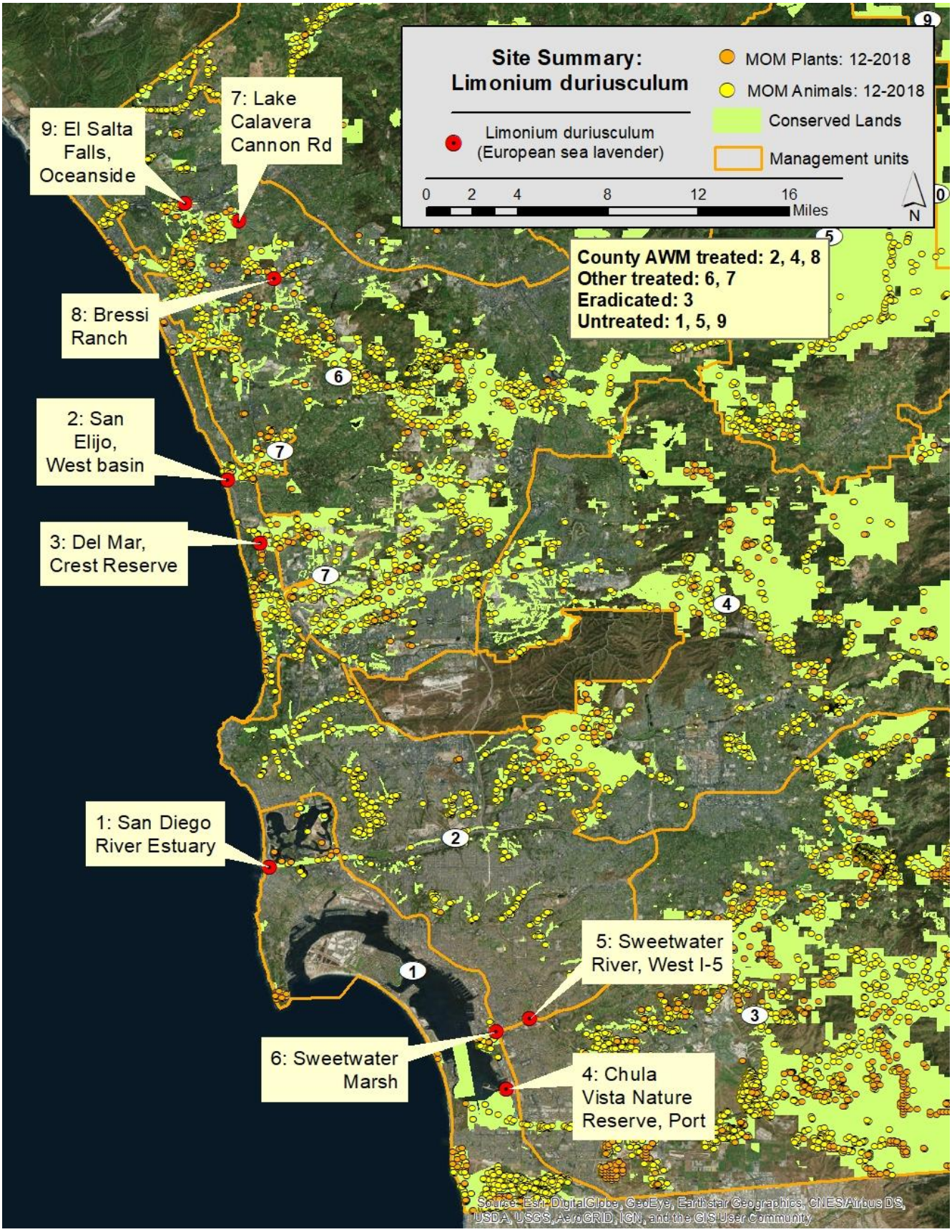
Table 9. Summary of treatments performed by AWM on *Genista monspessulana*, French broom.

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #5 Heise Park	French broom	1	0.6	1.5	1,130

1,130 plants were treated (5% mature/re-sprouts and 95% seedlings). Two days were spent finishing work at the Heise County Park site by a crew of two individuals on October 1&2, 2019.


Genista monspessulana: Site #5 Heise Park
Genista monospessulana
(French broom)
0 25 50 100 150
Yards
N
Glenco Ln
Glenco Ln
1501
Esri, HERE, Garmin, (c) OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

***Limonium duriusculum*, European sea lavender:**

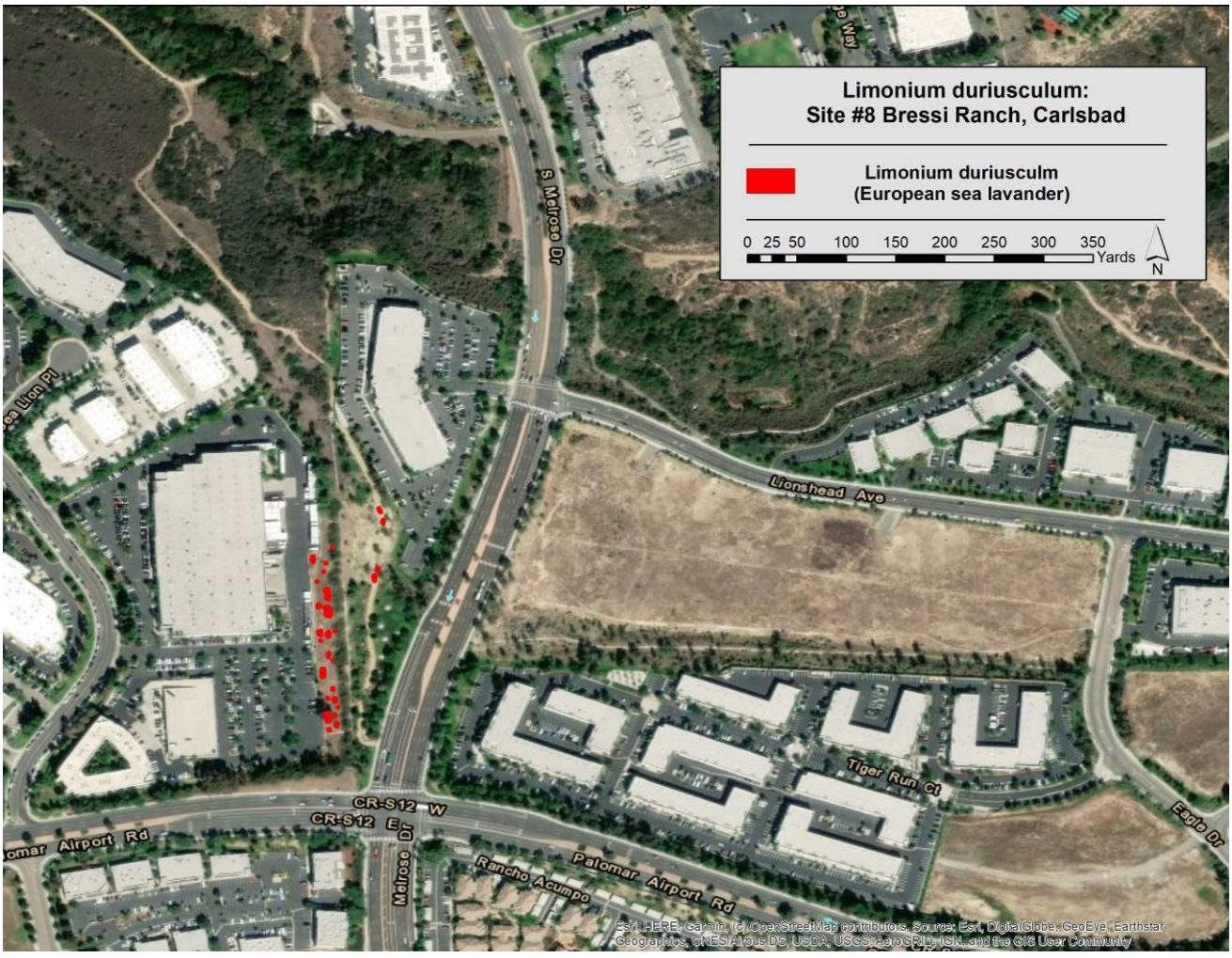


***Limonium duriusculum*, European sea lavender: Site #8 Bressi Ranch**

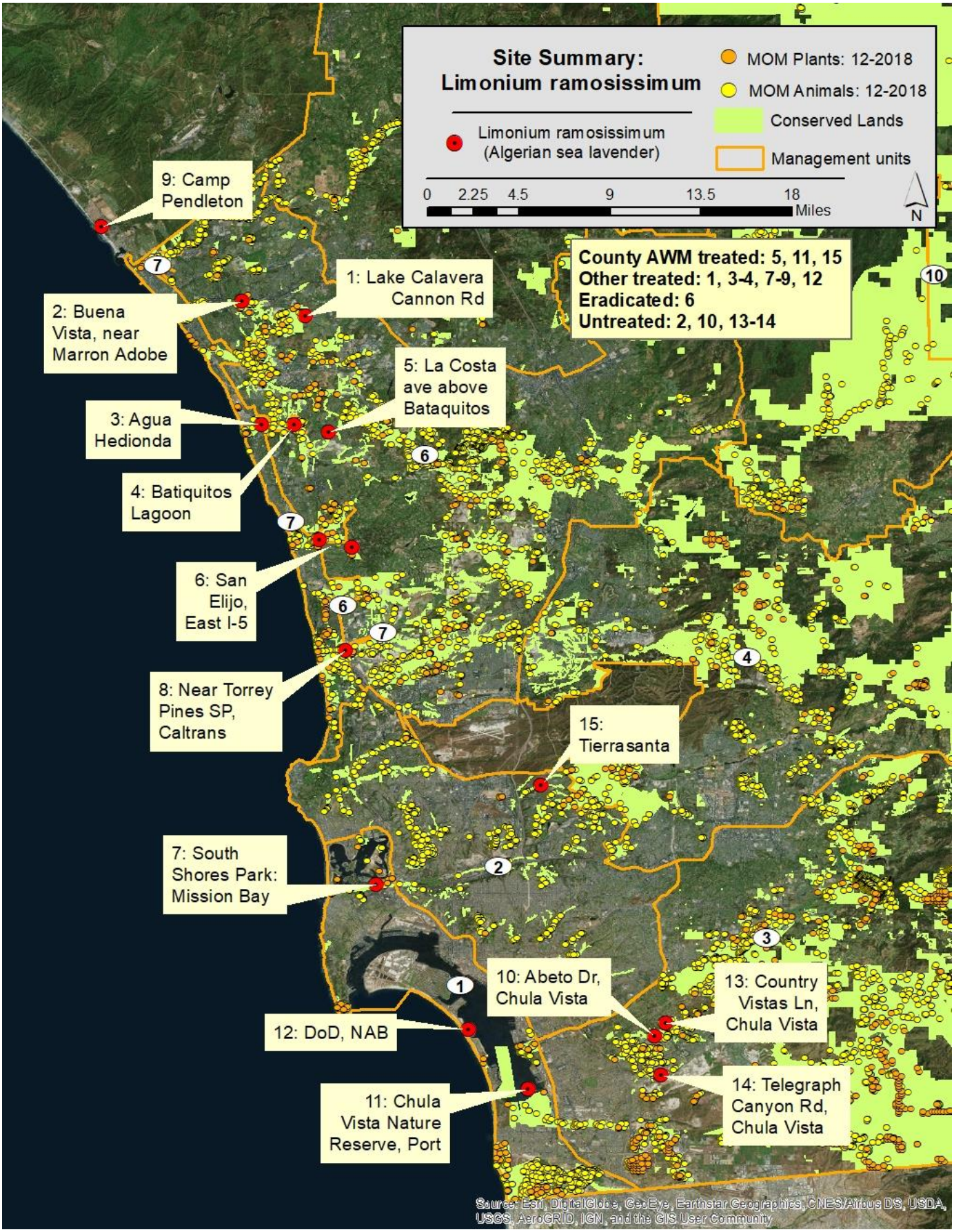
Table 10. Summary of treatments performed by AWM on *Limonium duriusculum* (European sea lavender).

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #8 Bressi Ranch	European sea lavender	1	0.2	1.0	800

800 plants (5% mature/95% seedlings) were treated foliar treated by a crew of two individuals on October 9th 2019. Cover is greatly reduced in past treatment areas (>95% cover reduction), but there are still many seedlings sprouting.



***Limonium ramosissimum*, Algerian sea lavender:**

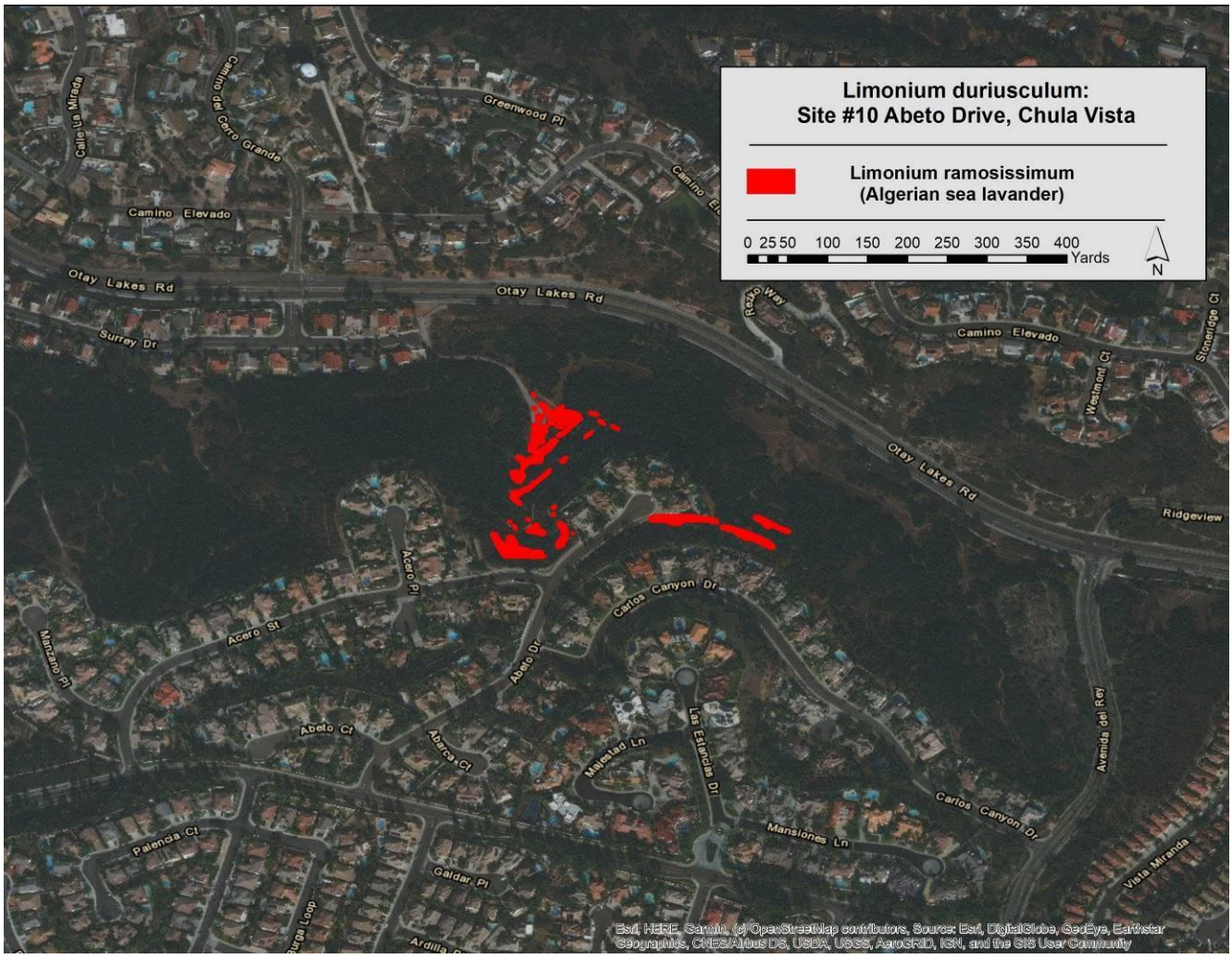


***Limonium ramosissimum*, Algerian sea lavender: Site #10 Abeto Dr, Chula Vista**

Table 11. Summary of treatments performed by AWM on *Limonium ramosissimum* (Algerian sea lavender).

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #10 Abeto Dr, Chula Vista	Algerian sea lavender	1	2.7	3.6	>30,000

This was the first treatment of this large heavily invaded site (see photos below). Plants often formed dense monotypic patches forming a carpet. Crews foliar treated with backpacks. A crew of two to three individuals worked six days October 11th to the 18th 2019.



***Limonium ramosissimum*, Algerian sea lavender: Site #13 Country Vistas, Chula Vista**

Table 12. Summary of treatments performed by AWM on *Limonium ramosissimum* (Algerian sea lavender).

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #13 Country Vistas, Chula Vista	Algerian sea lavender	1	0.6	1.4	>7,500

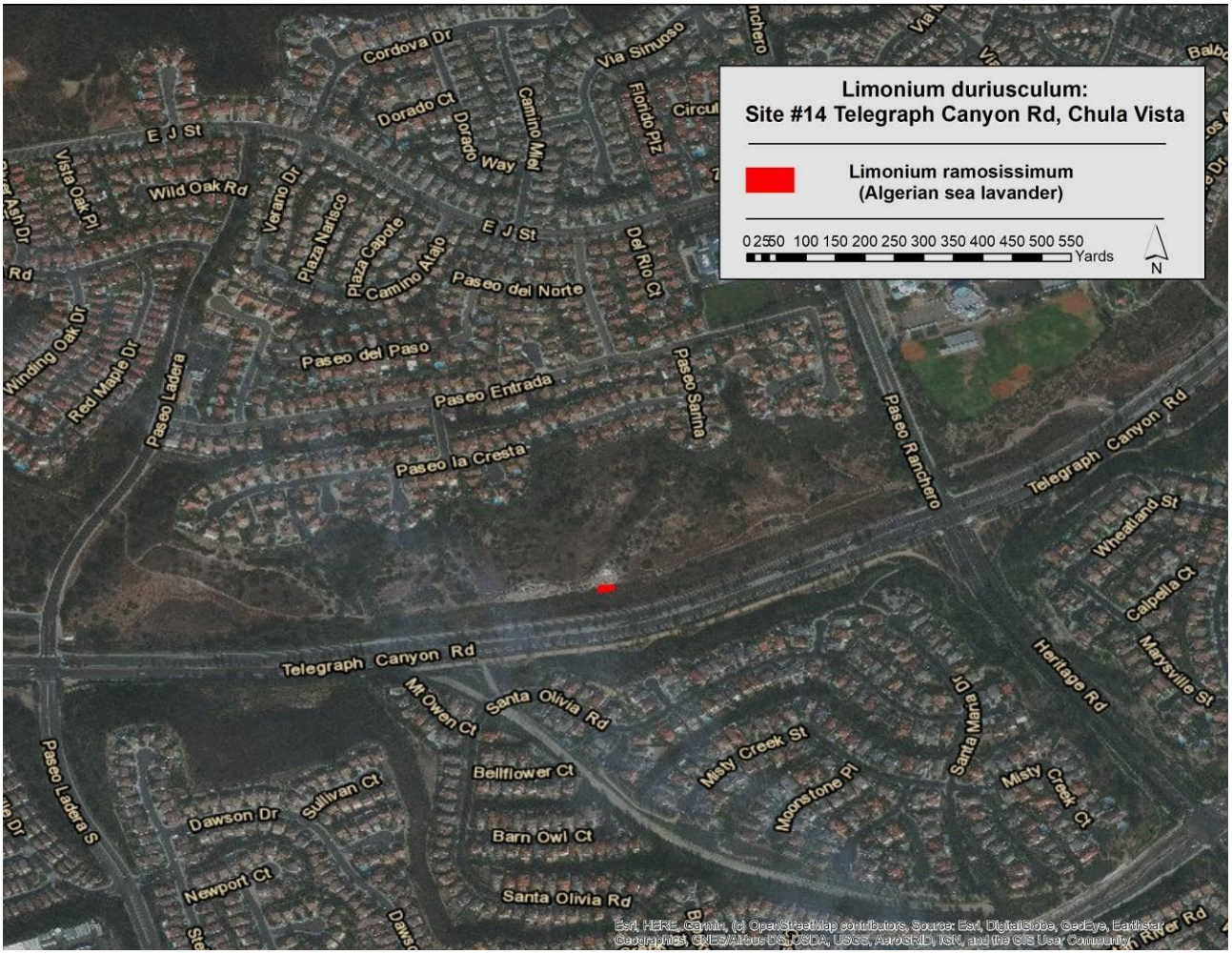
This was the first treatment of this large heavily invaded site. Plants often formed dense patches (see photos below). Crews foliar treated with backpacks. A crew of two to three individuals worked two days October 23rd and 25th 2019.

***Limonium ramosissimum*, Algerian sea lavender: Site #14 Telegraph Canyon Rd, Chula Vista**

Table 12. Summary of treatments performed by AWM on *Limonium ramosissimum* (Algerian sea lavender).

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #14 Telegraph Canyon Rd, Chula Vista	Algerian sea lavender	1	0.1	0.7	550

This was the first treatment of a lightly invaded site. Plants occurred in scattered patches. Crews foliar treated with backpacks. A crew of two individuals worked one day October 22nd 2019.



TASK 4 – AWM: Invasive Plant Level 3 Management.

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

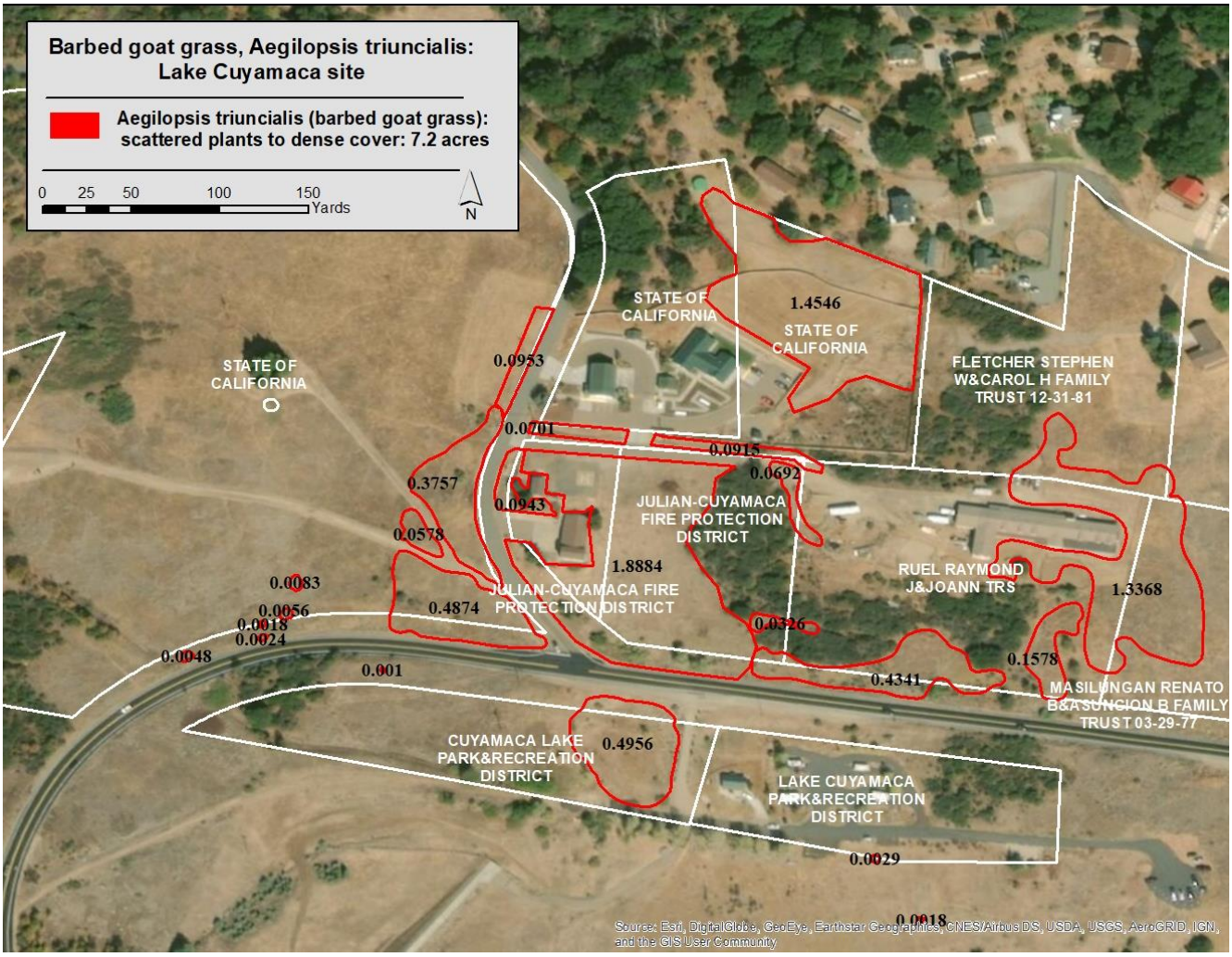
- No charges during this quarter.

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

Level of Effort: (5%) of overall contract

- A presentation was given at the California Invasive Plant Council (Cal-IPC) Symposium in Riverside in October 2019, at the State Weed Management Area (WMA) meeting. The EDRR program supported by SANDAG was the focus of the talk.
- A presentation was given at the San Diego Management and Monitoring Program(SDMMP) December meeting on the two new large efforts that have been initiated: Ward's weed in Carlsbad and Barbed goatgrass.
- Co-ordination with the 'Ward's weed control team' in Carlsbad at Bressi Ranch continued. A control program has started work Ward's weed at Bressi Ranch, the largest invaded side in North America. The City of Carlsbad, The Nature Collective, CNLM, and AWM are the primary team members. County AWM has secured $65k from CDFA to start work on the southern portion of the site. SANDAG funding will be used to complete treatments and carryout re-treatments, if the CDFA funding does not cover all treatment work. The City of Carlsbad has allocated $200k to the overall control program. The Nature Collective will direct $100k in current Wildlife Conservation Board funding to the site. CNLM will direct $30k to its management areas. The long term goal is to eradicate Ward's weed.

- Co-ordination to initiate control on the only known population of Barbed goatgrass in San Diego County at Lake Cuyamaca occurred. County AWM has secured $65k in CDFA funding for two years of work. The project involves State Parks, private property, and CalFire.



Work Anticipated for 3rd Quarter Period, January 1st – March 31st 2019:

Task 1 – Invasive Plant Species Coordinator:

- Coordinate ROE work with AWM, update database.
- Monitor and coordinate with AWM during implementation.
- Survey and map sites as needed.
- Prepare quarterly report.

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 treatment polygons and survey routes (lines) of targeted weeds.

Task 3 – AWM: Invasive Plant Level 2 Management.

- Re-treatment of sites.

- 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 treatment polygons and survey routes (lines) 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, San Diego Weed Management Area and Orange County California Natural Plant Society EDRR invasive's group.
- Continue to aggregate data and track new prospective EDRR target species.
- Attend SDMMP land manager, working group and other meetings as requested.