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

Strategic Removal of Invasive Weed Species
4th Quarter Report - FY 2017-18: Report #14 for Project

April 1st, 2018 – June 30th, 2018

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

To: Kim Smith and Sarah Pierce
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San Diego CA 92101

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:

This quarterly report covers work funded through the SANDAG Contract, which allowed work to occur from April 1st to June 30th 2018.

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.

The coordinator worked on six species at twelve field sites:

Work tasks included monitoring field crews, assessing treatment success, and mapping and surveying target plants. This included site visits to asses phenology (growth stage of plants) to help time treatments. Site visits occurred:

- Limonium work at Loker Ave (Carlsbad) and San Elijo (Solana Beach).
- Canary Island St. John's Wort: Lake Murray and Tecolote Canyon.
- Euphorbia terracina at Black Mountain sites.
- Volutaria: Rice Canyon, Chula Vista.

Report preparation:

Quarterly report for Q4 FY 2017-18 was prepared.

Mapping and occurrence data:

Spatial data was updated. It has been determined that survey lines (tracks of crew during surveys) are more representative of survey work during treatments. Digitizing survey areas using the tracking line data sometimes over represented searched areas (areas between lines were not always searched and access routes in and out of the site are not counted toward survey acreage multiple times). Additionally digitizing survey areas based on line data was an added step in office work for the field crews. A more accurate assessment of crew activities at sites can now be made. This data is now presented as lines on field work maps (see maps in this report).

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, 2 invasive weed species (Carnation spurge and Volutaria knapweed) at 2 sites this quarter. Maps for sites now 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 Surveyed	Acres Treated	Plants Controlled
Euphorbia terracina	Carnation spurge	1	0.7	0.1	1,200
Volutaria tubilflora	Volutaria desert knapweed	1	7.5	1.2	2,838

***Euphorbia terracina* (carnation spurge):**

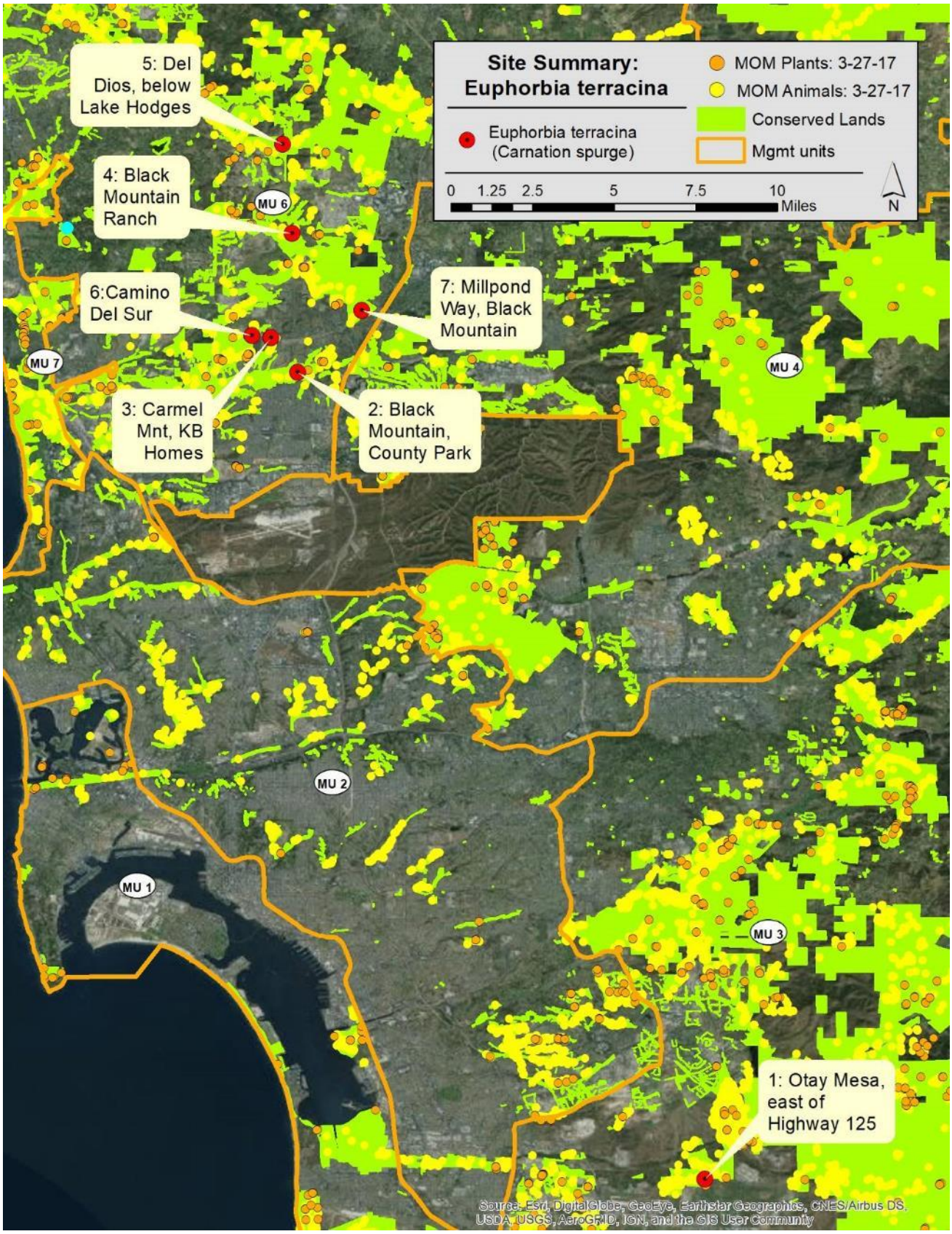
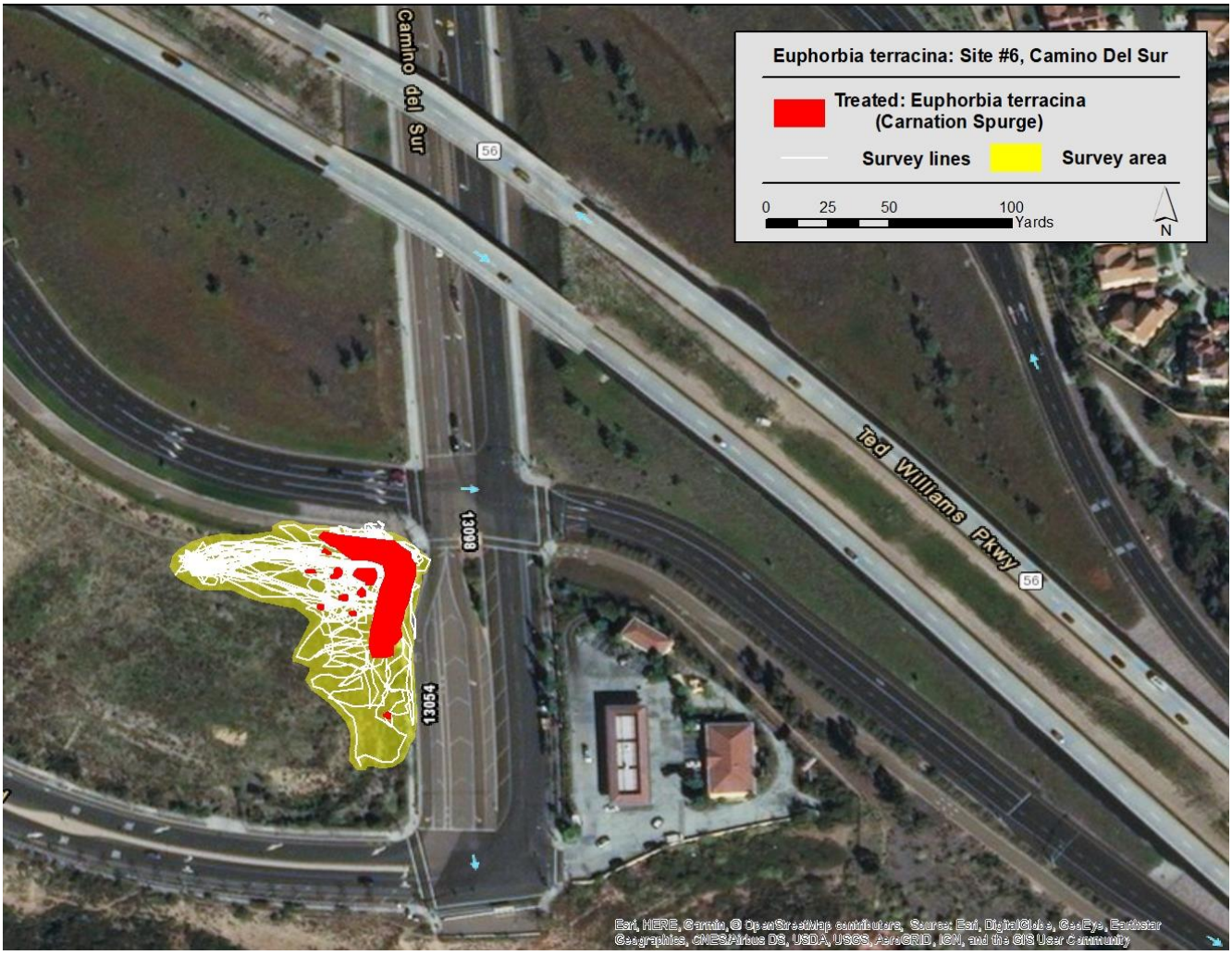


Table 2. Summary of treatments performed by AWM on *Euphorbia terracina* (carnation spurge).

Work Site	Common Name	# of Work Cycles	Acres Surveyed	Acres Treated	Plants Controlled
Site #6, Camino Del Sur	carnation spurge	1	0.7	0.1	1,200

***Euphorbia terracina* (carnation spurge): Site #6, Camino Del Sur**

Mature plants and many seedlings were manually removed (1,200 plants). A crew of four individuals worked one day on 6/22/2018. There has been a reduction in cover (>80%), but there is an extensive seedbank that continues to generate new seedlings each spring.



***Volutaria tubiliflora*, Volutaria knapweed:**

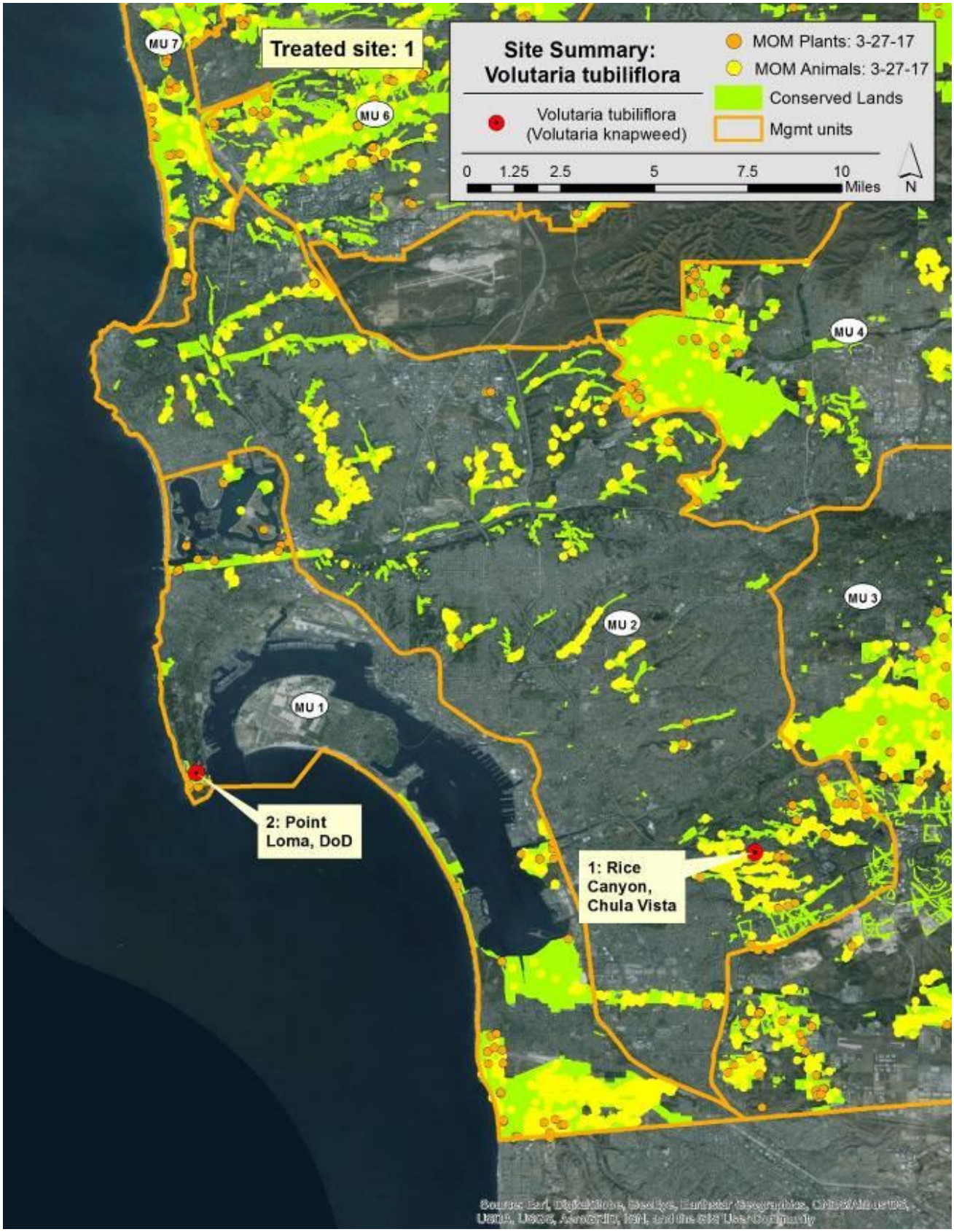


Table 3. Summary of treatments performed by AWM on *Volutaria tubiliflora* (Volutaria knapweed).

Site Name	Common Name	# of Work Cycles	Acres Surveyed	Acres Treated	Plants treated
Site #1: Rice Canyon, Chula Vista	Volutaria desert knapweed	2	7.5	1.2	2,838

This is the second year of treating this site and the second year of applying pre-emergent. Rains this year were very late and light. The pre-emergent (Milestone) applied in early spring worked well. Plants were scattered along edges of the treatment zone and in one area that should have pre-emergent used (it will next year). A crew of two to three hand pulled 832 scattered plants and a patch of 2,000 plants over five days April 17-20 and 23- 2018. A second site visit occurred on June 18th-2018. A crew of two walked the entire area and pulled six plants.

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, 3 invasive weed species at 7 sites this quarter: Spotted knapweed (CDFA funded), Canary St. John's Wort, and European sea lavender. 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 4. Summary of treatments performed by AWM on Level 2 species this quarter.

Scientific Name	Common Name	# of Sites Worked	Acres Surveyed	Acres Treated	Plants Controlled
Centaurea stoebe	Spotted knapweed	3	18.9	6.9	12,845
Hypericum canariense	Canary Island St. John's Wort	2	7.8	1.7	3,650
Limonium duriusculum	European sea lavender	2	5.3	4.0	7,002

***Centaurea stoebe*, Spotted Knapweed:**

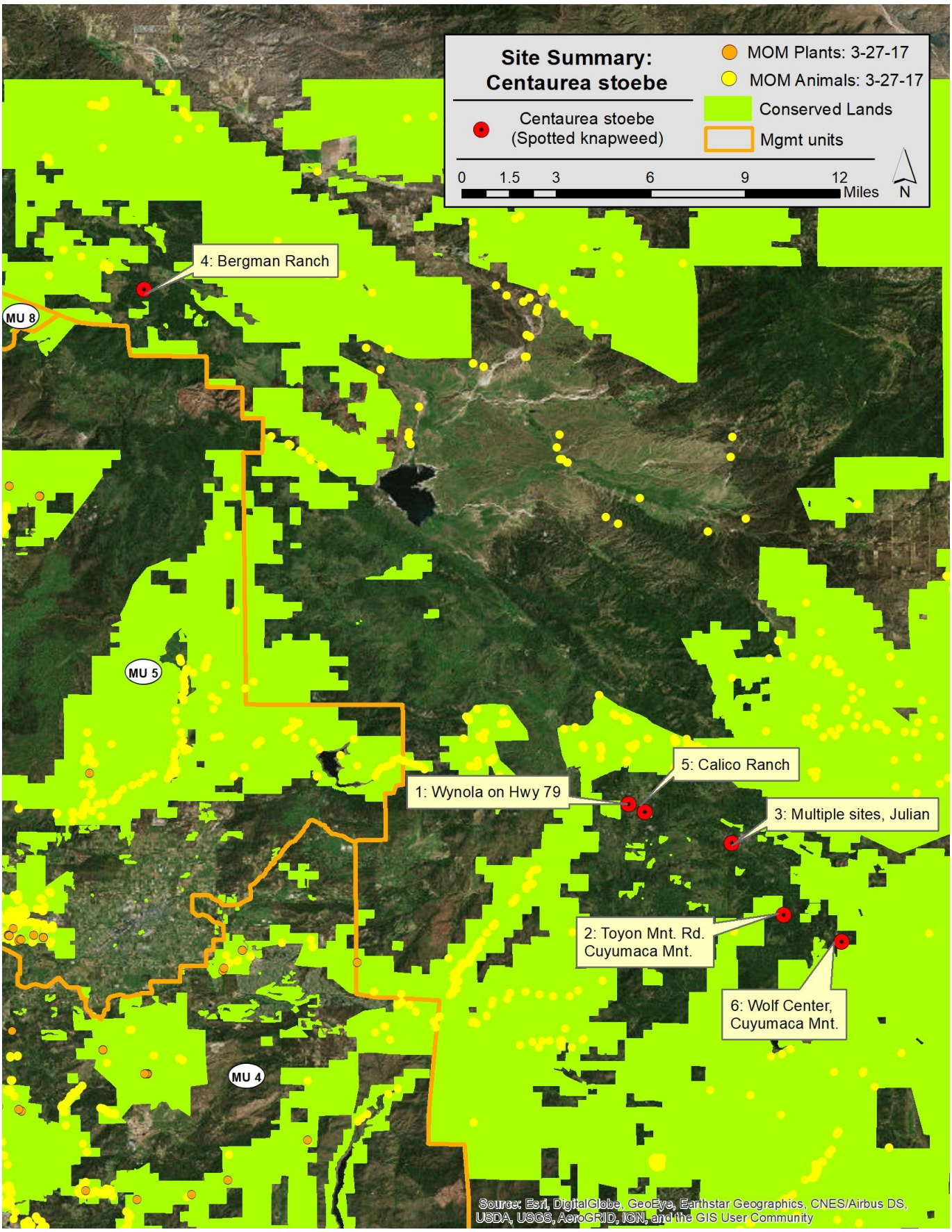


Table 5. Summary of treatments performed by AWM on *Centaurea stoebe* (spotted knapweed).

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
Site #4, Bergman Ranch	Spotted knapweed	1	10	1.6	1,725

The site was treated by a crew of two to three over nine days, between May 24th and June 29th-2018. Multiple treatment methods were used: hand pulling mature plants and herbicide application using Milestone and glyphosate. This EDRR treatment work was funded by CDFA, but is reported here as the species is a Level 2 EDRR target.

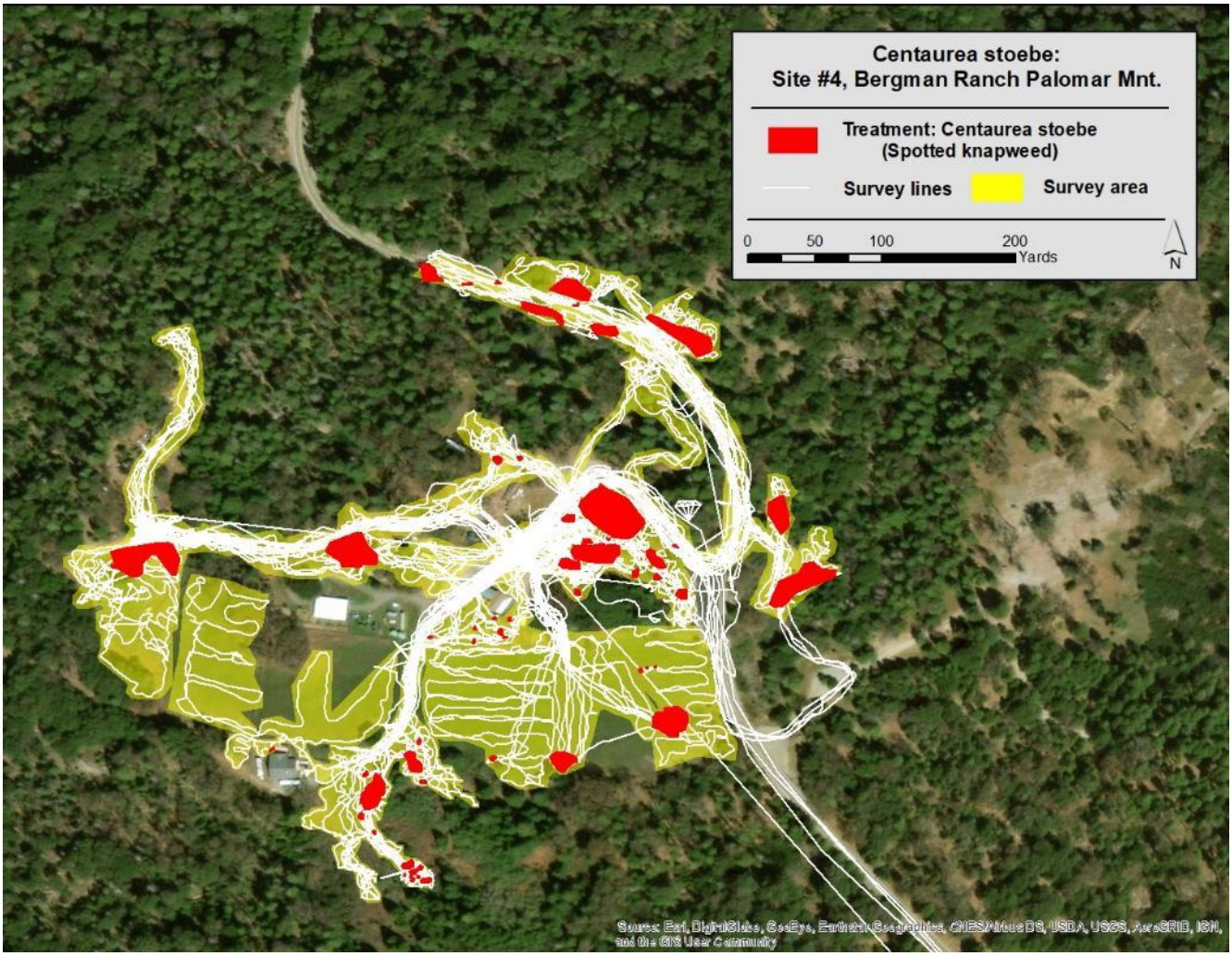


Table 5. Summary of treatments performed by AWM on *Limonium ramosissimum* (Algerian sea lavender).

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
Site #5, Calico Ranch	Spotted knapweed	1	2.9	1.9	1,930

The site was treated by a crew of two over three days May 21, 23 and June 13-2018. Multiple treatment methods were used: hand pulling mature plants and herbicide application using Milestone

and glyphosate. This EDRR treatment work was funded by CDFA, but is reported here as the species is a Level 2 EDRR target.

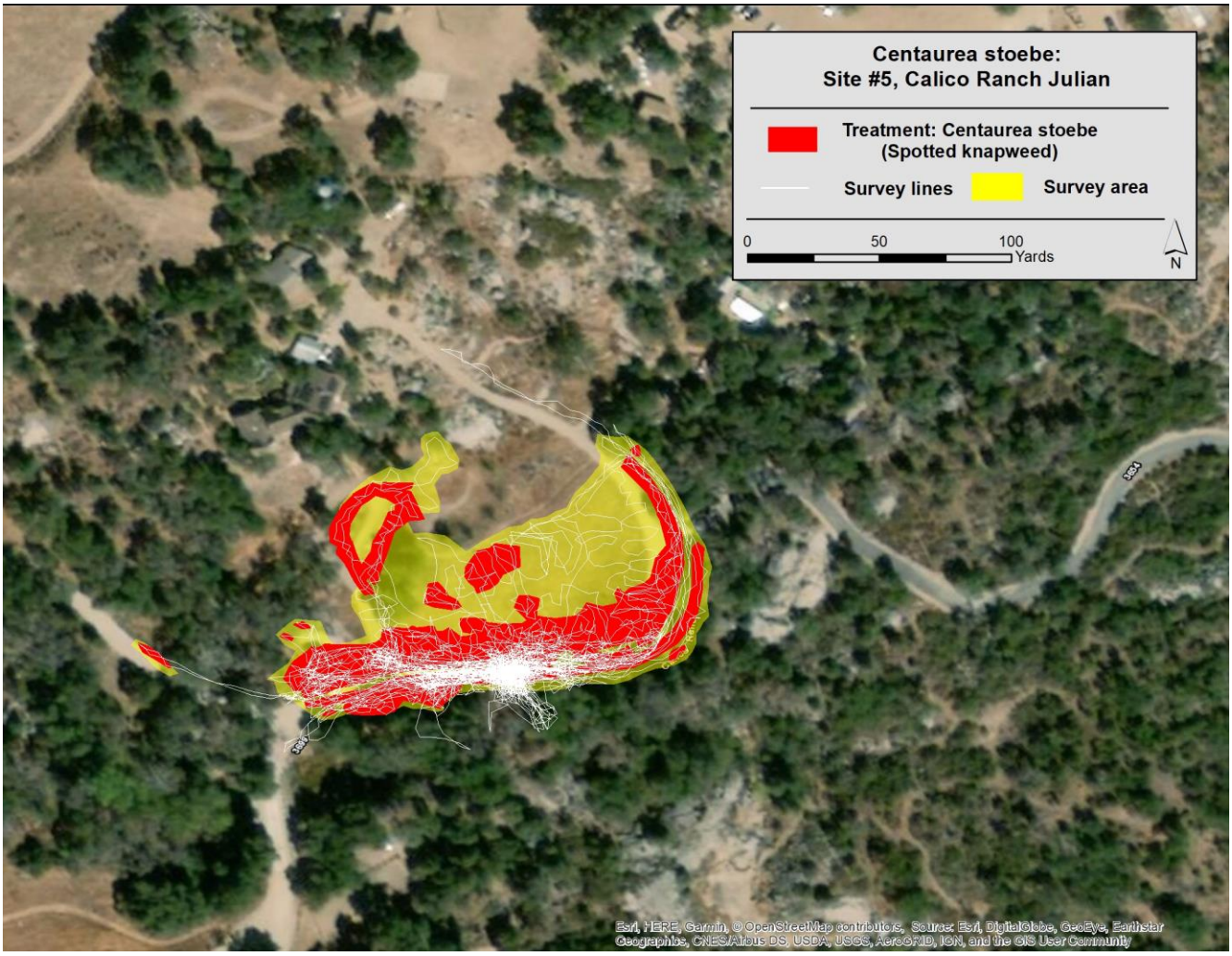
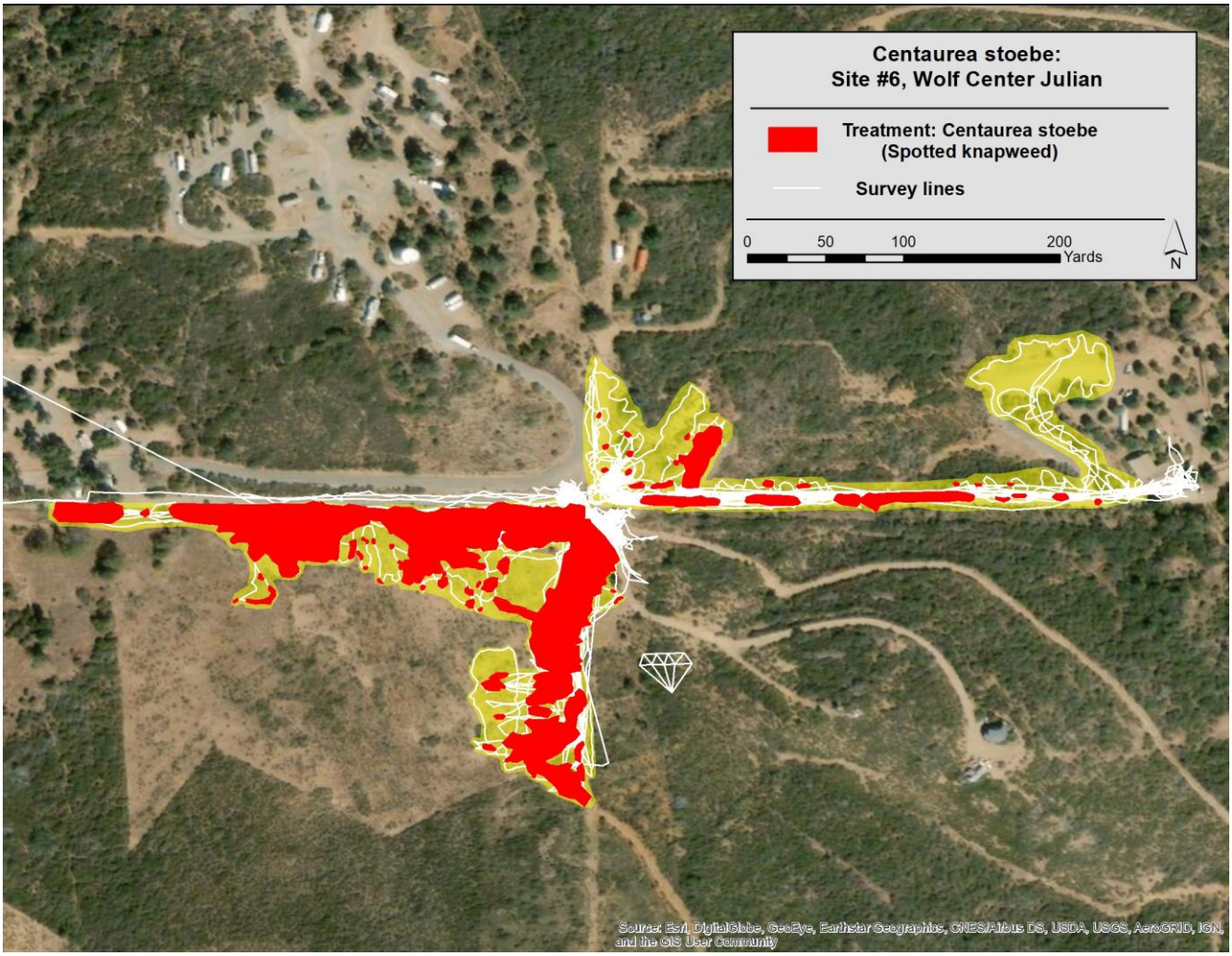


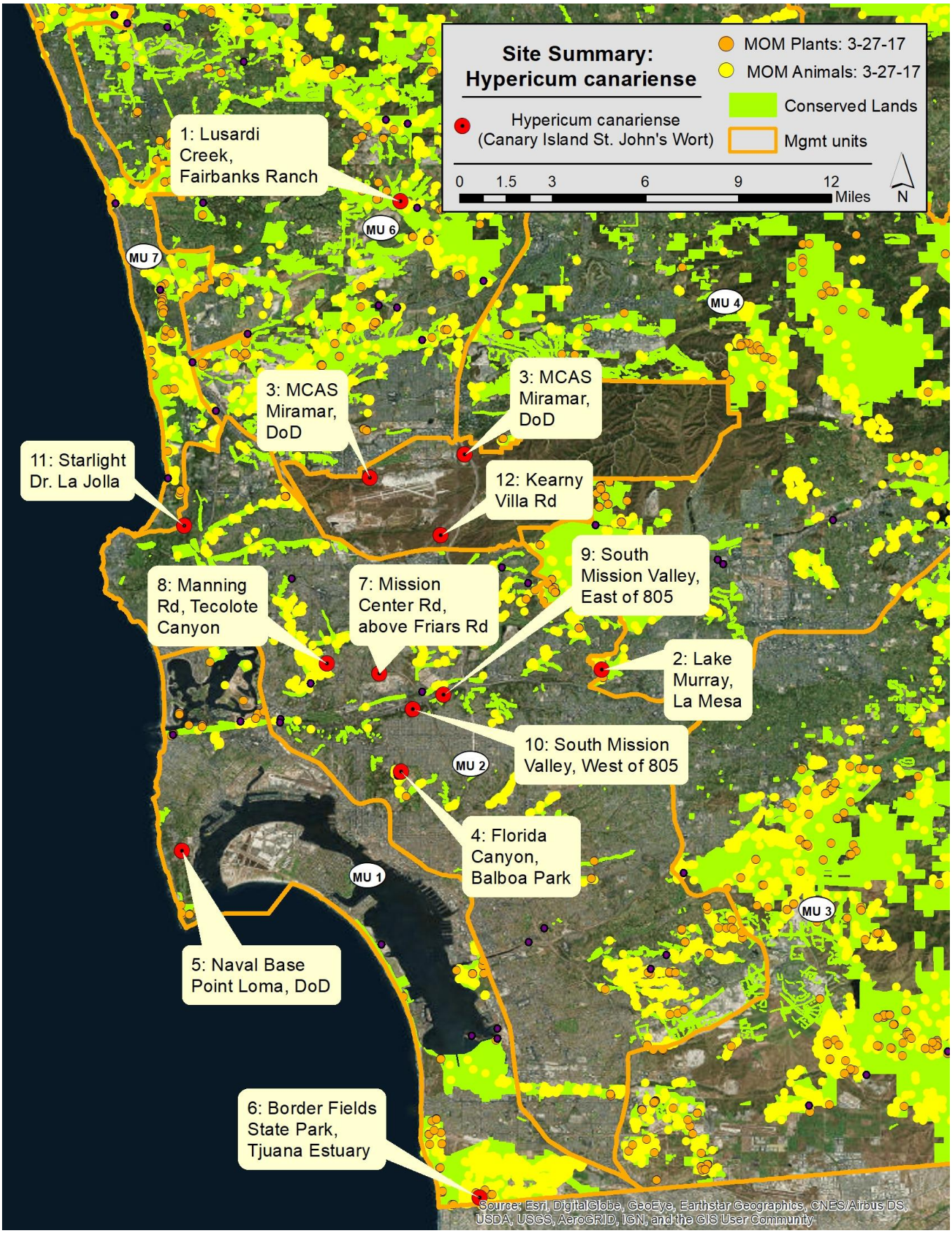
Table 5. Summary of treatments performed by AWM on *Limonium ramosissimum* (Algerian sea lavender).

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
Site #6, Wolf Center Julian	Spotted knapweed	1	2.9	1.9	1,930

The site was treated by a crew of two over eight days between May 22 and June 27-2018. Multiple treatment methods were used: hand pulling mature plants and herbicide application using Milestone and glyphosate. This EDRR treatment work was funded by CDFA, but is reported here as the species is a Level 2 EDRR target.


Centaurea stoebe:
Site #6, Wolf Center Julian
Treatment: Centaurea stoebe
(Spotted knapweed)
Survey lines
0
50
100
200
Yards
N
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

***Hypericum canariense*, Canary Island St. John's wort**

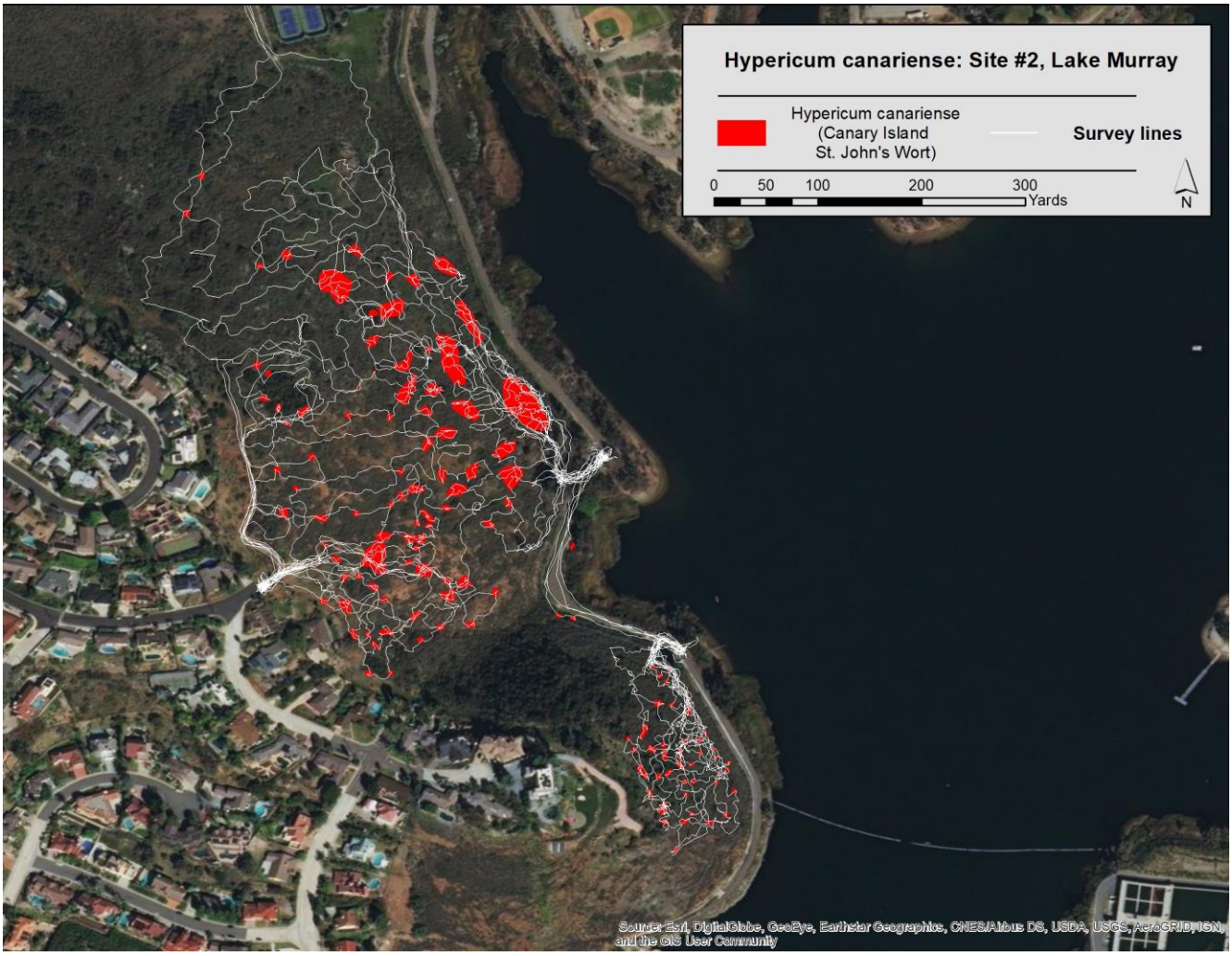


Hypericum canariense, Canary Island St. John's wort: Site #2 Lake Murray

Table 6. Summary of treatments performed by AWM on *Hypericum canariense* (Canary Island St. John's wort)

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
Site #2, Lake Murray	Canarey Island St. John's Wort	1	7.3	1.2	2,190

Re-sprouting plants and seedlings were foliar treated with herbicide (Element 4). A crew of two individuals visited the site over seven days from April 3rd to the 30th-2018. Cover is greatly reduced (>90% cover reduction), but there were scattered re-sprouts and seedlings.



Hypericum canariense, Canary Island St. John's wort: Site #8 Tecolote Canyon

Table 7. Summary of treatments performed by AWM on *Limonium duriusculum* (European sea lavender).

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
Site #4, Florida Canyon, Balboa Park	Canary Island St. John's Wort	1	13.4	5.3	4,385

Re-sprouting plants and seedlings were foliar treated with herbicide (Element 4). A crew of two individuals visited the site over four days from May 4th to the 14th-2018. Cover is greatly reduced (>90% cover reduction), but there were scattered re-sprouts and seedlings.

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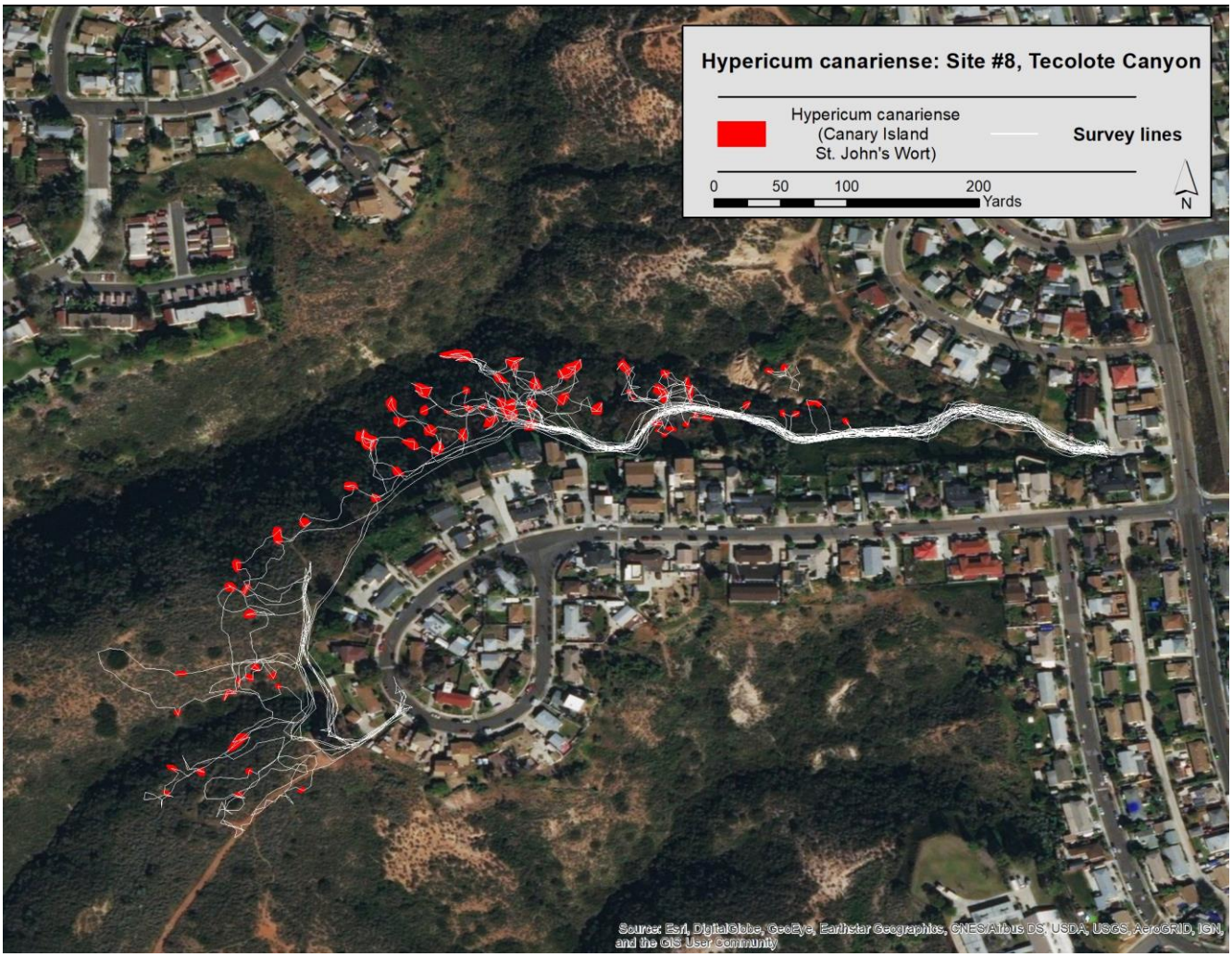
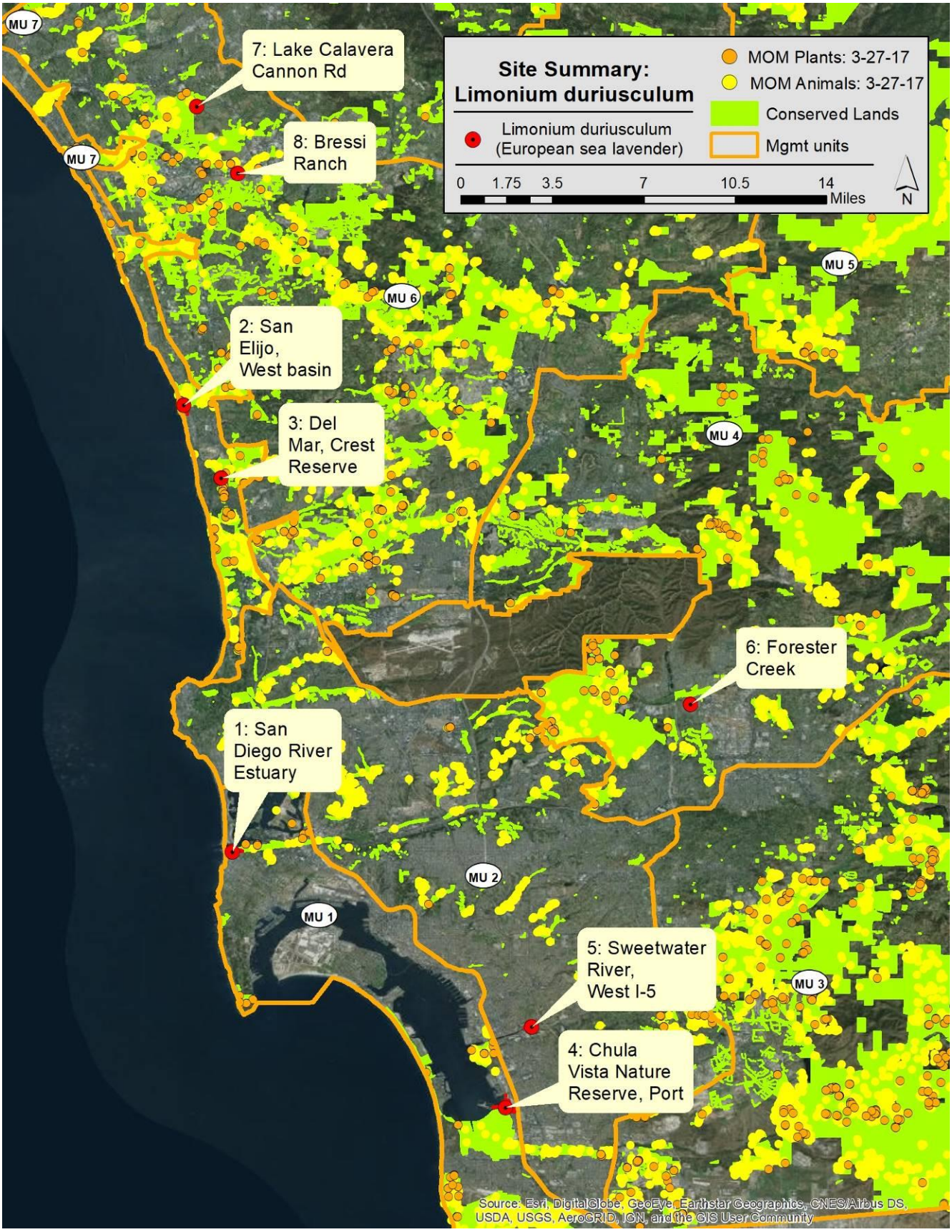


***Limonium duriusculum*, European sea lavender:**



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

Table 8. Summary of treatments performed by AWM on *Limonium duriusculum* (European sea lavender).

Site Name	Common Name	# of Work Cycles	Acres Surveyed	Acres Treated	Plants treated
Site #8 Bressi Ranch	European sea lavender	1	7.0	0.1	852

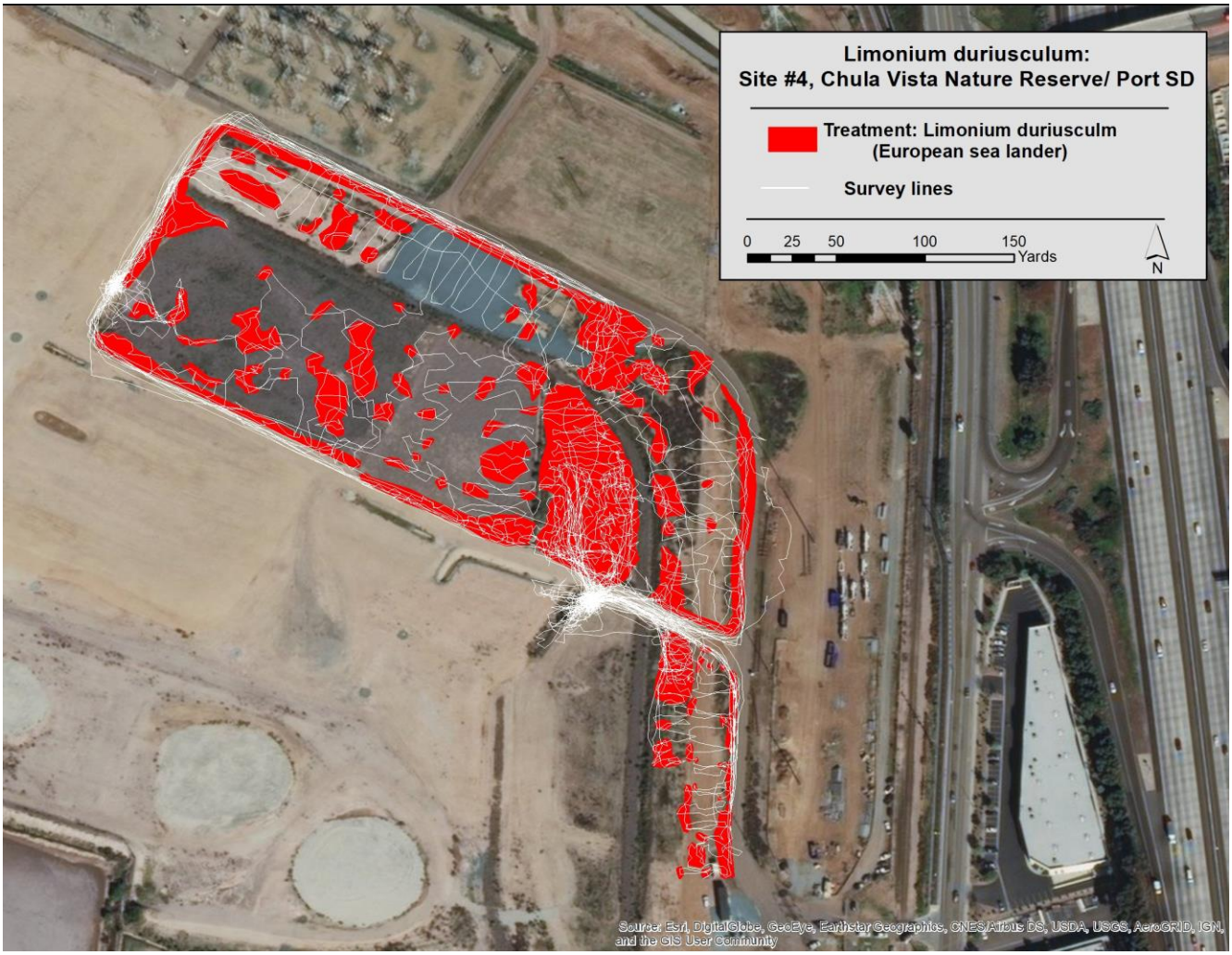
Re-sprouts and seedlings were treated with glyphosate. A crew of two individuals worked on 6-22-2018. Cover is greatly reduced (>95% cover reduction), but there are a few re-sprouts and scattered seedlings sprouting.

***Limonium duriusculum*, European sea lavender: Site #4: Chula Vista Nature Reserve/Port**

Table 9. Summary of treatments performed by AWM on *Limonium duriusculum* (European sea lavender).

Site Name	Common Name	# of Work Cycles	Acres Surveyed	Acres Treated	Plants treated
Site #Chula Vista Nature Reserve/Port SD	European sea lavender	1	4.0	3.5	6,150

Re-sprouts and seedlings were treated with glyphosate. A crew of two individuals worked on 6-22-2018. Cover is greatly reduced (>95% cover reduction), but there are a few re-sprouts and scattered seedlings sprouting.



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 of annual work on EDRR species was made at the San Diego Weed Management Area meeting on June 4th, 2018.
- A Plant ID sheet for Medusahead was completed.

Work Anticipated for 4th Quarter Period, July 1 – Septemner 30th, 2018:

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.
- Submit GIS data for target EDRR species and work with SDMMP of invasives mapping attribute data.

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 County of Orange CNPS EDRR invasives group.
- Continue to aggregate data and track new prospective EDRR target species.
- Attend SDMMP land manager, working group and other meetings as requested.