

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

**Strategic Control of Invasive Weed Species
4th Quarter Report - FY 2021-22: Report #30 for Project**

April 1st, 2022 – June 30th, 2022

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

To: Kim Smith
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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:

This quarterly report covers work funded through the SANDAG Contract, which allowed work to occur from April 1st to June 30th, 2022.

Covid 19: The outbreak has modified work procedures. Small crews are continuing field work following County and State guidelines. County AWM is following these procedures as they complete work.

TASK 1 – Invasive Plant Species Coordinator:

Level of Effort: (25%) of overall contract

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

Coordination with property owners, land managers and AWM crew occurred throughout the quarter. This supported work this quarter and preparation for the next quarter. ROEs and coordination with Caltrans, City of San Diego, and County of San Diego open space for Stinknet control work in the Otay West/Furby was a continued effort this quarter.

The coordinator worked on multiple species at sites across the county:

Current work sites were visited and assessed. These included: Barbed Goat Grass, Ward's Weed, Carnation Spurge, Yellow Starthistle, Canary Island Saint John's Wort and Stinknet.

Regulatory permits:

No new work.

Report preparation:

The quarterly report was prepared and submitted.

Mapping and occurrence data:

Reviewing iNaturalist EDRR observations (confirming and correcting IDs), as well as mapping and surveying for new populations occurred. GIS coverage of all sites was updated (points). GIS coverage of all work was updated (polygons).

Work plan:

Work crew species and sites to be treated were updated.

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 NCCP portion of the county when the IPSP was written (2012).

Crews surveyed and treated two invasive weed species (Barbed Goat Grass and Carnation Spurge) at two sites this quarter. Maps for site 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 pulling 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 |
|-----------------------------|--------------------|--------------------------|----------------------|-----------------------|--------------------------|
| <i>Aegilops triuncialis</i> | Barbed Goat Grass | 1 | 1.4 | 2.5 | 14,950 |
| <i>Euphorbia terracina</i> | Carnation Spurge | 4 | 0.7 | 2.3 | 6,250 |

***Aegilops triuncialis* (Barbed Goat Grass):**

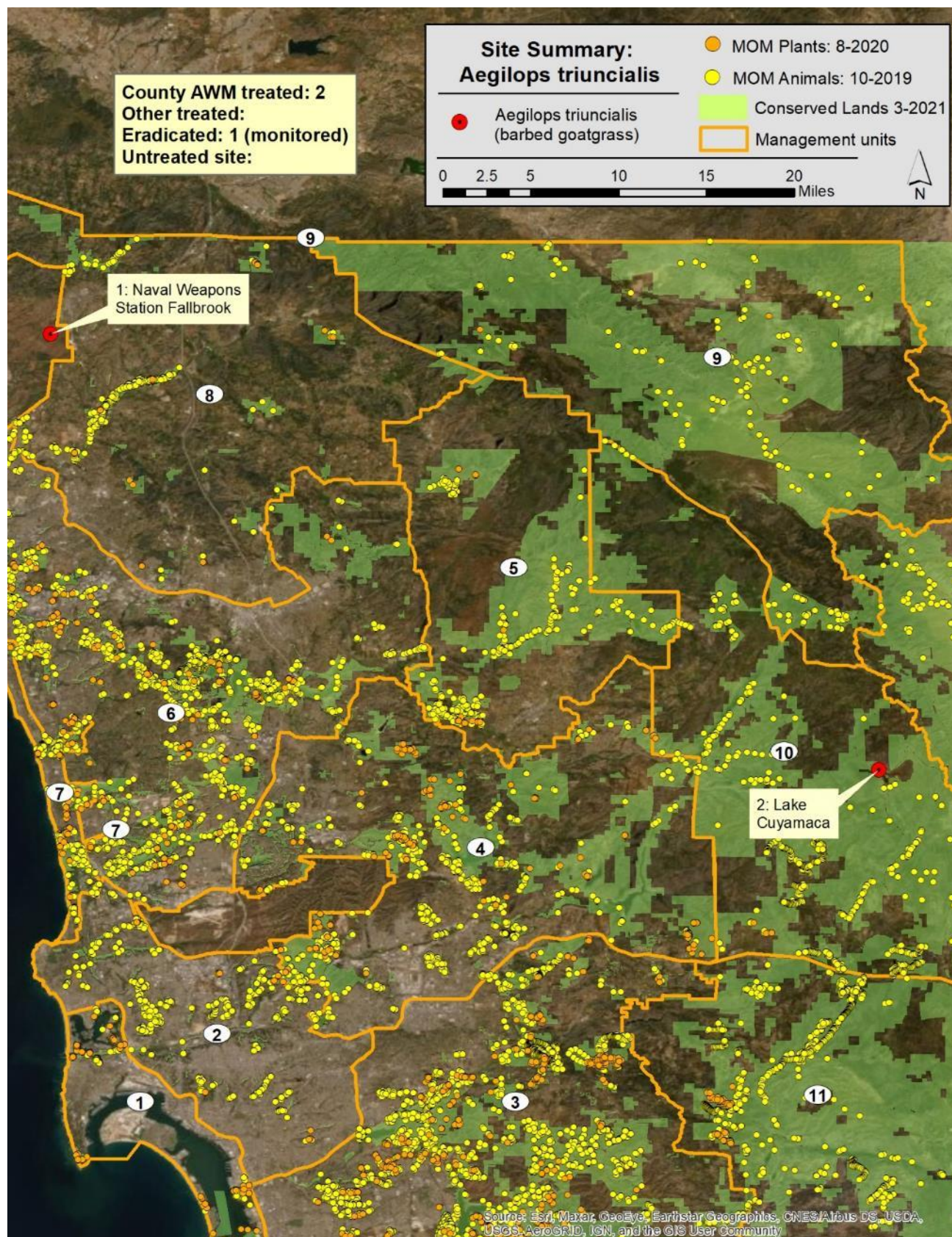
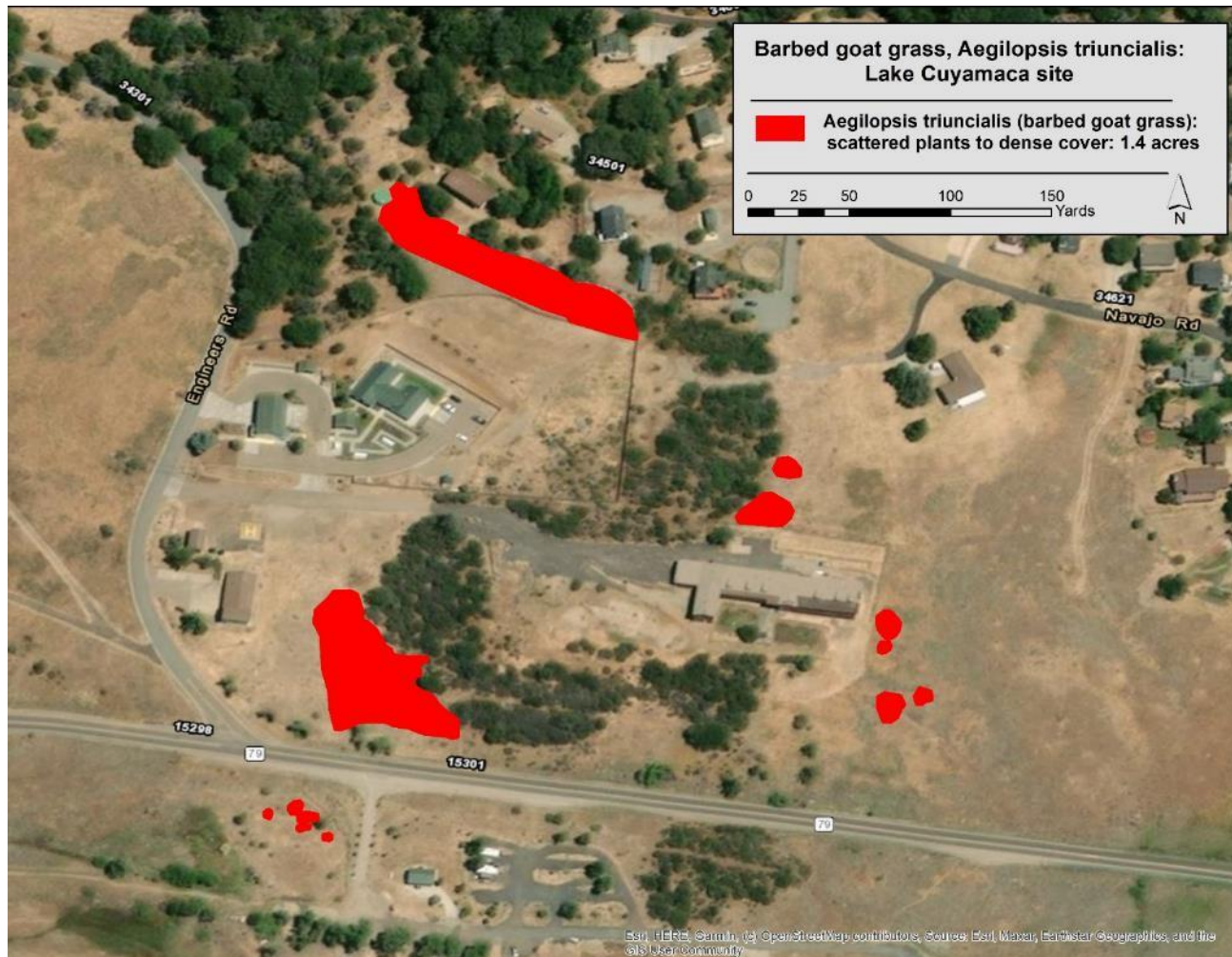


Table 2. Summary of treatments performed by AWM on *Aegilops triuncialis* (Barbed Goat Grass).

| Work Site | Common Name | # of Work Cycles | Acres Treated | Acres Surveyed | Plants Controlled |
|-----------------------|-------------------|------------------|---------------|----------------|-------------------|
| Site #2 Lake Cuyamaca | Barbed Goat Grass | 1 | 1.4 | 2.5 | 14,950 |

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

No pre-emergent was used in winter 2021-22. Two years of application had occurred so the site was not treated to test effectiveness and reduce loading of the pre-emergent in the soil. Heavy early rains seemed to favor grasses, particularly annuals. The site had extensive cover of Barbed Goat Grass, many areas had cover requiring line trimming. Some areas were hand pulled. Next year a grass specific herbicide will be used, in addition to spot treating with a post emergent. The County AWM crew of two worked 10 days, June 10-24th, 2022.



Euphorbia terracina (Carnation Spurge):

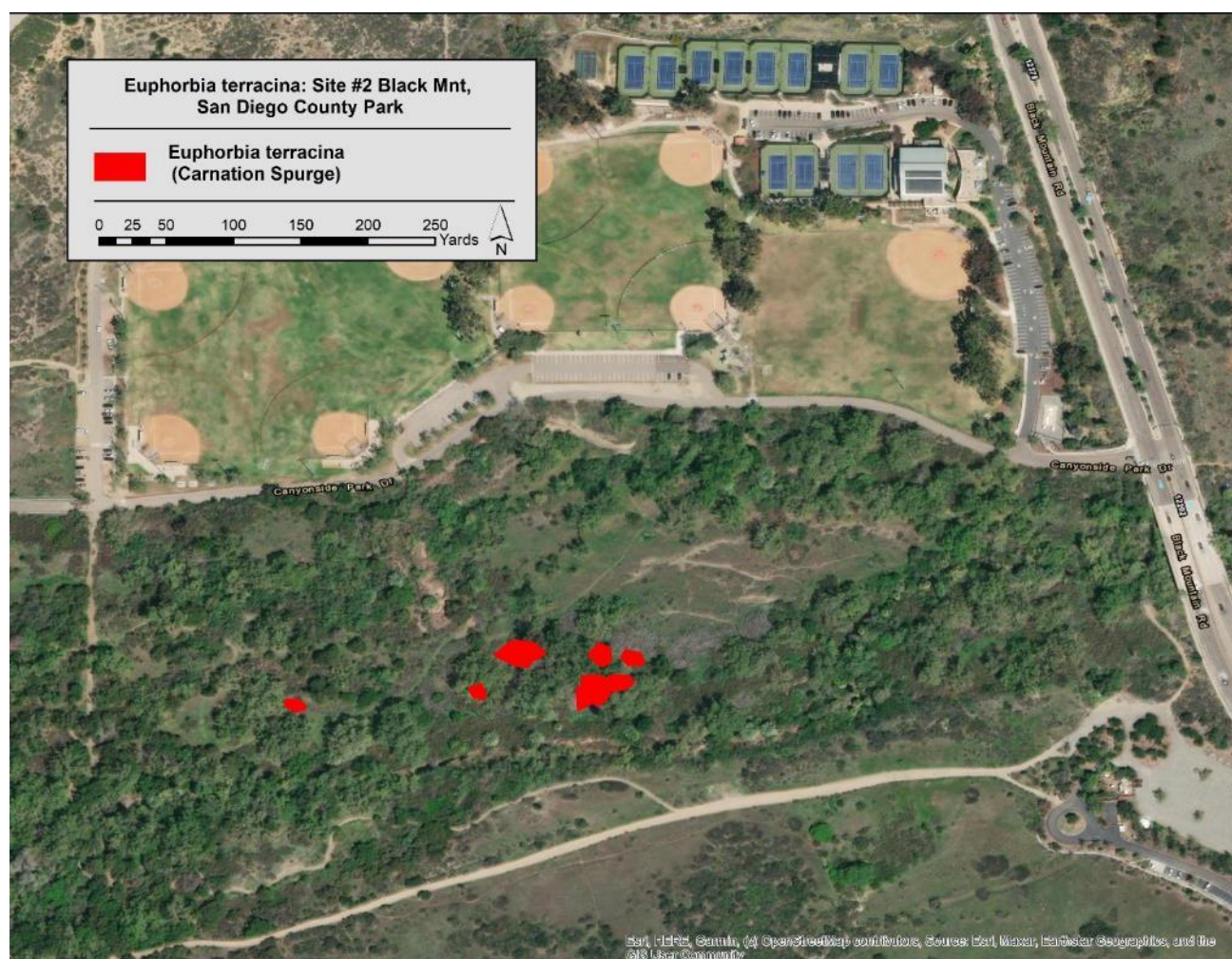


Euphorbia terracina (Carnation Spurge): Site #2, Black Mt. Park

Table 3. 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 #2, Black Mt. Park | Carnation Spurge | 1 | 0.5 | 0.3 | 3,400 |

Many forbs did not respond well to early heavy rains in winter 2021-22 followed by almost no rainfall until April. Carnation Spurge seemed to favor this odd rainfall pattern. Extensive germination from a very persistent seedbank was expressed. This year a granular form of pre-emergent (with the same active ingredient as Gallery SC, which is being used on Ward's Weed and Stinknet) was applied to spurge sites. In addition, mature plants and many seedlings were pulled. A crew of two individuals worked four days from June 2nd to June 7th, 2022. There has been a reduction in cover (>80%), but there is an extensive seedbank that continues to generate new seedlings each spring. Hopefully the granular pre-emergent will help suppress this persistent seedbank.

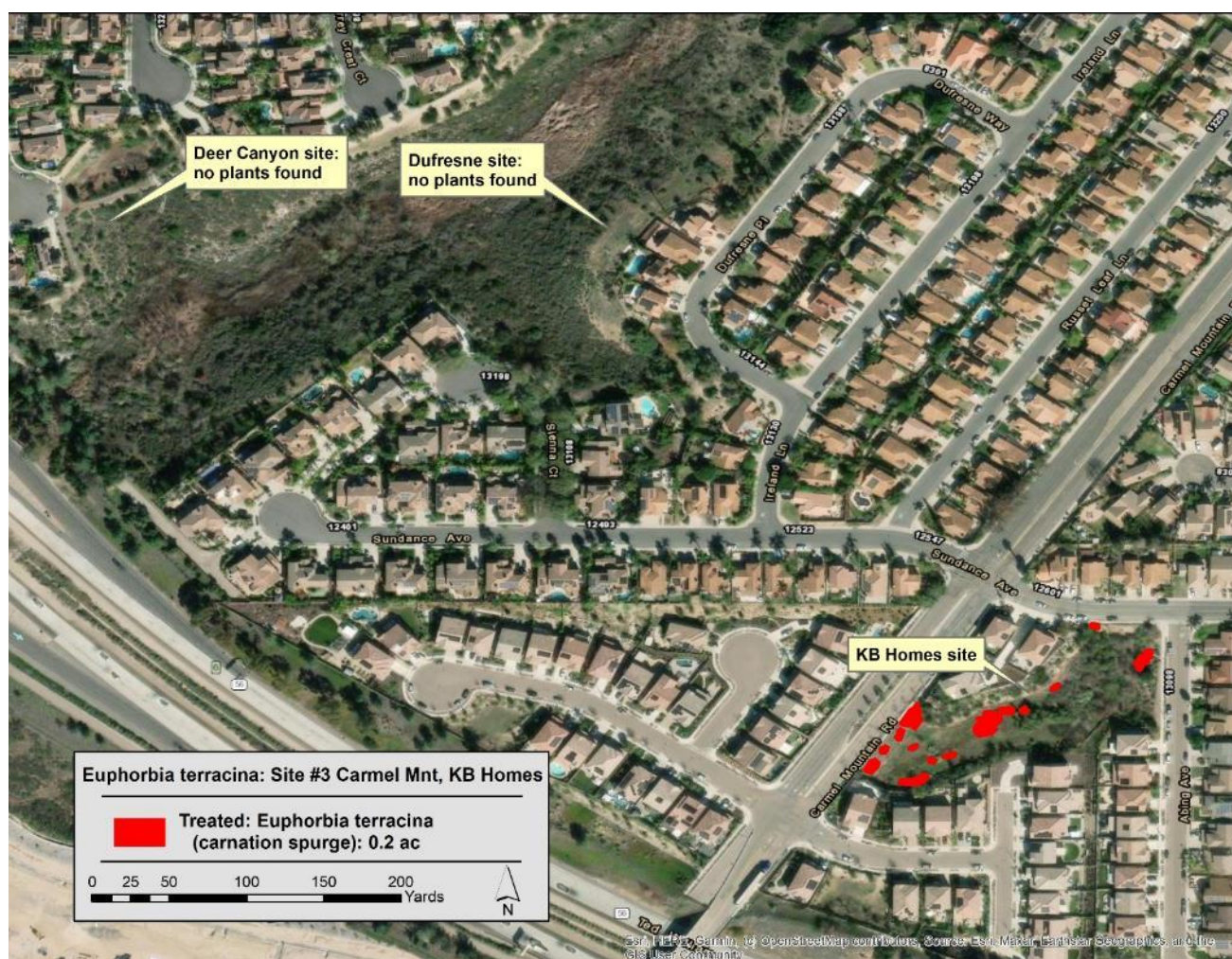


Euphorbia terracina (Carnation Spurge): Site #3 KB Homes, Carmel Mt.

Table 4. Summary of treatments performed by AWM on *Euphorbia terracina* (Carnation Spurge).

| Work Site | Common Name | # of Work Cycles | Acres Treated | Acres Surveyed | Plants Controlled |
|------------------------------|------------------|------------------|---------------|----------------|-------------------|
| Site #3 KB Homes, Carmel Mt. | Carnation Spurge | 1 | 0.2 | 1.0 | 1,450 |

Many forbs did not respond well to early heavy rains in winter 2021-22 followed by almost no rainfall until April. Carnation Spurge seemed to favor this odd rainfall pattern. Extensive germination from a very persistent seedbank was expressed. This year a granular form of pre-emergent (with the same active ingredient as Gallery SC, which is being used on Ward's weed and stink net) was applied to spurge sites. In addition, mature plants and many seedlings were pulled. A crew of one to three individuals worked six days from April 29th to May 25th, 2022. There has been a reduction in cover (>90%), but there is an extensive seedbank that continues to generate new seedlings each spring. Hopefully the granular pre-emergent will help suppress this persistent seedbank.



***Euphorbia terracina* (Carnation Spurge): Site #6, Camino Del Sur**

Table 5. 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 | 0.5 | 0.1 | 1,150 |

Mature plants and many seedlings were manually removed (1,150 plants). A crew of one to three individuals worked three days May 25th to 31st 2022. There has been a reduction in cover (>80%), but there is an extensive seedbank that continues to generate new seedlings each spring. This year a granular form of pre-emergent (with the same active ingredient as Gallery SC, which is being used on Ward's Weed and stink net) was applied to spurge sites. Hopefully the granular pre-emergent will help suppress this persistent seedbank.



***Euphorbia terracina* (Carnation Spurge): Site #7 Millpond Way**

Table 6 Summary of treatments performed by AWM on *Euphorbia terracina* (Carnation Spurge).

| Work Site | Common Name | # of Work Cycles | Acres Treated | Acres Surveyed | Plants Controlled |
|----------------------|------------------|------------------|---------------|----------------|-------------------|
| Site #7 Millpond Way | Carnation Spurge | 1 | 0.1 | 0.3 | 250 |

This year a granular form of pre-emergent (with the same active ingredient as Gallery SC, which is being used on Ward's Weed and Stinknet) was applied to spurge sites. In addition, mature plants and many seedlings were pulled. A crew of one worked one day May 24th, 2022. There has been a reduction in cover (>90%), but there is an extensive seedbank that continues to generate new seedlings each spring. Hopefully the granular pre-emergent will help suppress this persistent seedbank.



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).

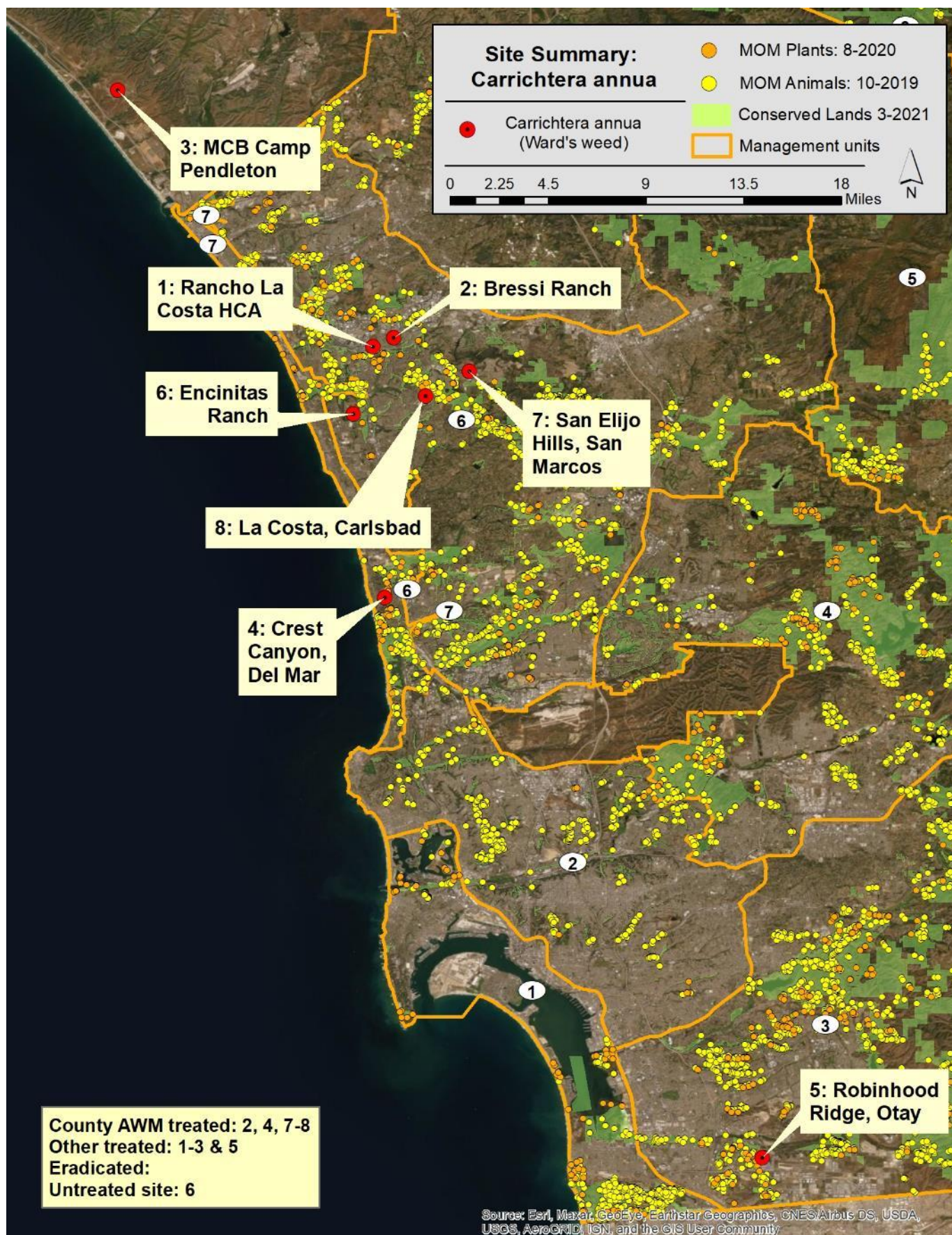
Crews surveyed and treated four invasive weed species (Yellow Starthistle, Spotted Knapweed, Canary Island Saint John's Wort, and Ward's Weed) at ten sites this quarter. AWM IPC made optimal pesticide applications, protected the natural environment by preventing off-site movement of pesticides, and utilized 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 7. 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 |
|-------------------------------|-------------------------------|--------------------------|----------------------|-----------------------|--------------------------|
| <i>Carrichtera annua</i> | Ward's Weed | 1 | 0.6 | 4.7 | 2,300 |
| <i>Centaurea solstitialis</i> | Yellow Starthistle | 5 | 0.3 | 10.4 | 42 |
| <i>Centaurea stoebe</i> | Spotted Knapweed | 1 | 0.1 | 1.1 | 36 |
| <i>Hypericum canariense</i> | Canary Island St. John's Wort | 3 | 1.2 | 17.6 | 3,504 |

Carrichtera annua, Ward's Weed:



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

Table 8. Summary of treatments performed by AWM on *Carrichtera annua*, Ward's Weed.

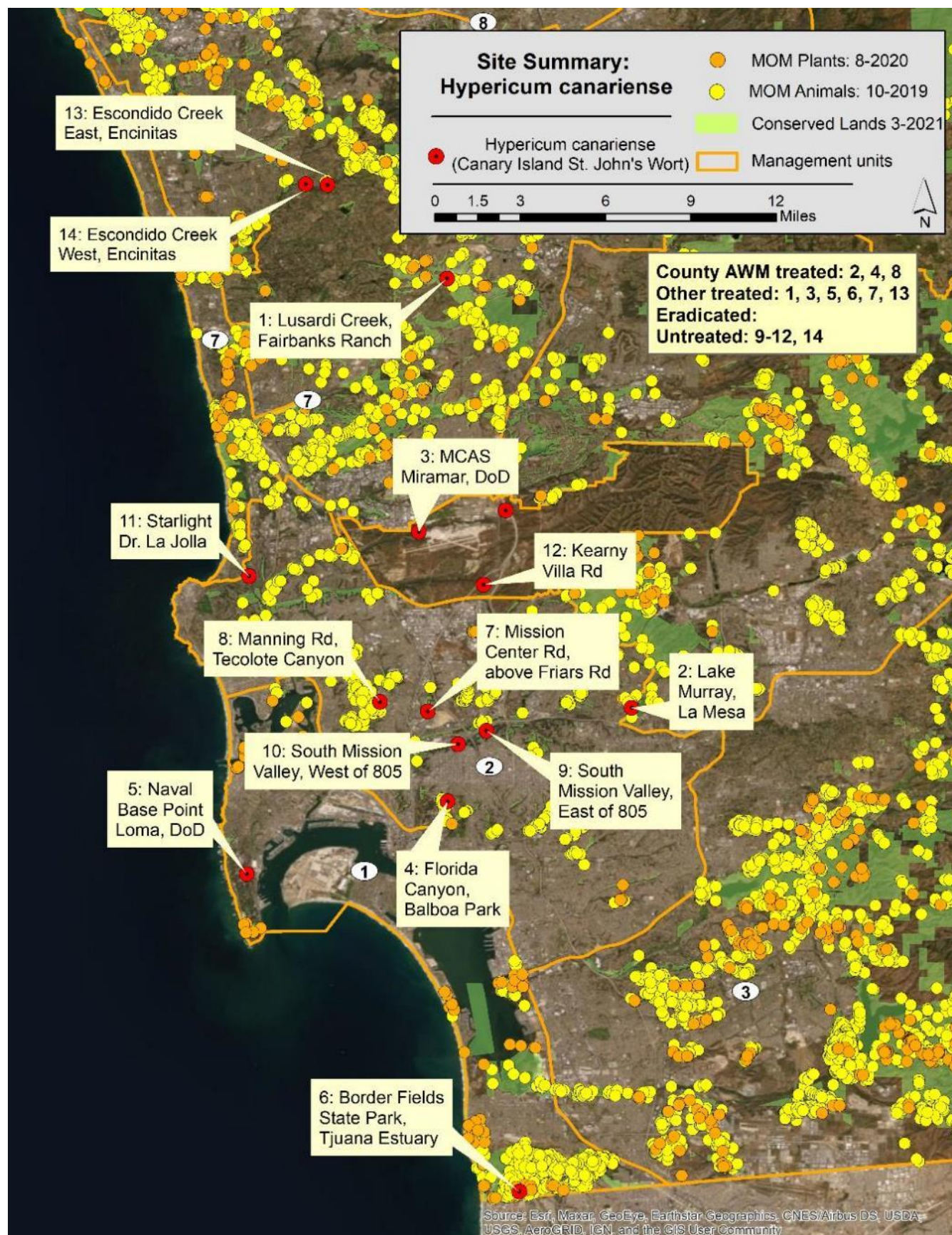
| Site Name | Common Name | # of Work Cycles | Acres Treated | Acres Surveyed | Plants treated |
|--------------------------------|-------------|------------------|---------------|----------------|----------------|
| Site #2 Bressi Ranch, Carlsbad | Wards Weed | 1 | 0.6 | 4.7 | 2,300 |

The Bressi Ranch (City of Carlsbad) Ward's Weed site is a very large site (>200 acres) covering rolling hills with many property owners (city, open space, and private yards). A group collaboration has been working on the site since 2019: City of Carlsbad and The Nature Collective are working on the northern and western portions of the site and County AWM has worked on the southern and eastern portions of the site. CNLM is taking the lead on the eastern La Costa Greens site. A pre-emergent herbicide (Gallery SC) was applied to the site in winter 2020/2021 and 2021/2022.

County AWM crews surveyed, and hand pulled plants seen in work areas. The pre-emergent worked well, but soil disturbance and gaps in application allow expression of plants from the seedbank. The crew applied granular pre-emergent where plants were seen to patch the holes where plants are being seen. One long strip did not get treated previously, this area was not hand pulled, but granular was applied. This area will be re-treated in winter 2022/23. A crew of one to two worked seven days from May 9th to the 18th 2022.



Hypericum canariense, Canary Island St. John's Wort

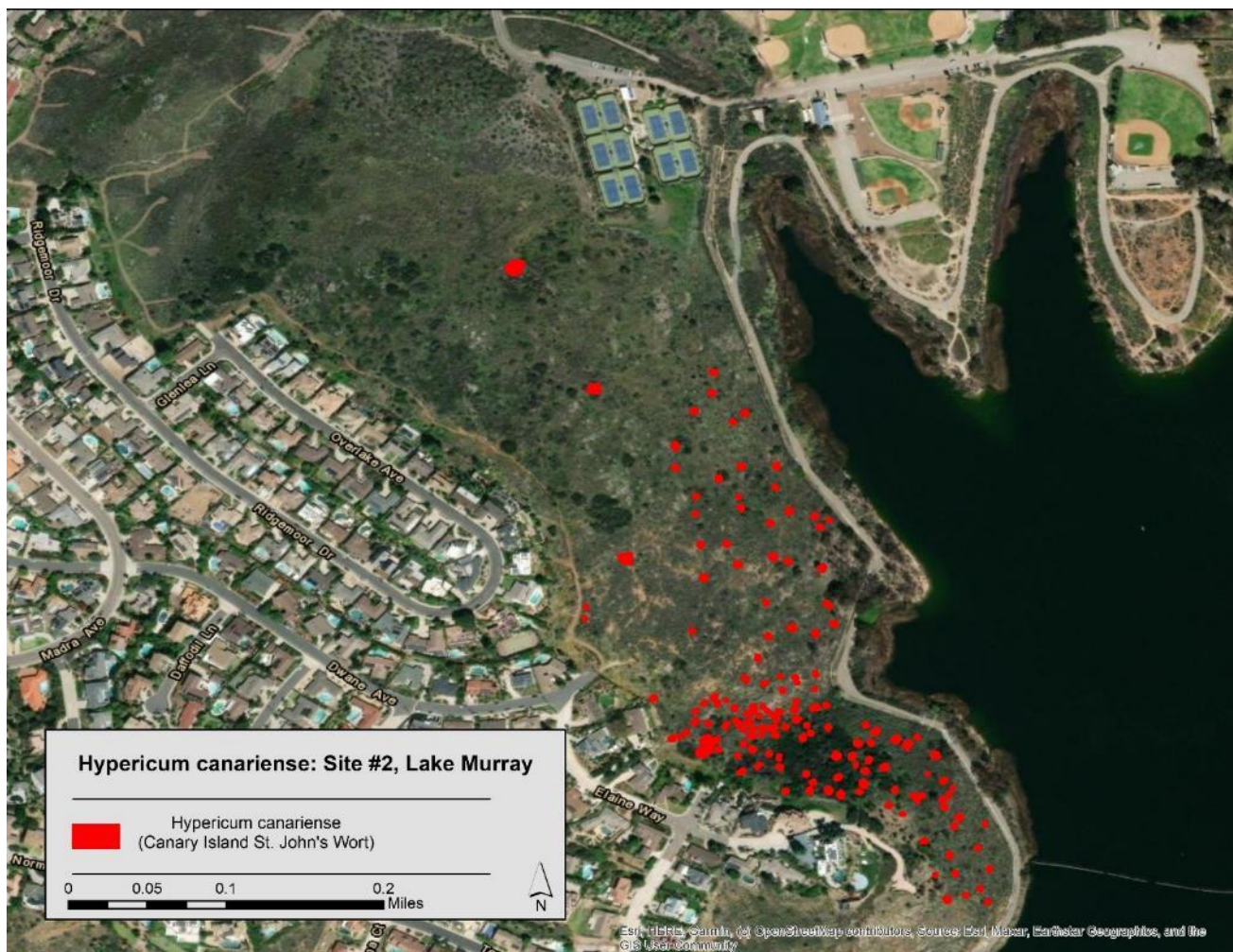


***Hypericum canariense*, Canary Island St. John's Wort: Site #2 Lake Murray**

Table 9. Summary of treatments performed by AWM on *Hypericum canariense*, Canary Island St. John's Wort.

| Site Name | Common Name | # of Visits | Acres Treated | Acres Surveyed | Plants treated |
|----------------------------|-------------------------------|-------------|---------------|----------------|----------------|
| <i>Site #2 Lake Murray</i> | Canary Island St. John's Wort | 1 | 0.6 | 8.1 | 1,034 |

A crew of one to three worked eight days in April 2022. Small plants (40%) and seedlings (60%) were foliar treated with a post emergent herbicide mix with some pre-emergent efficacy (glyphosate/imazapyr); some plants were also treated with triclopyr. Cover is greatly reduced (>95% cover reduction), but there are scattered seedlings and some resprouts still emerging.

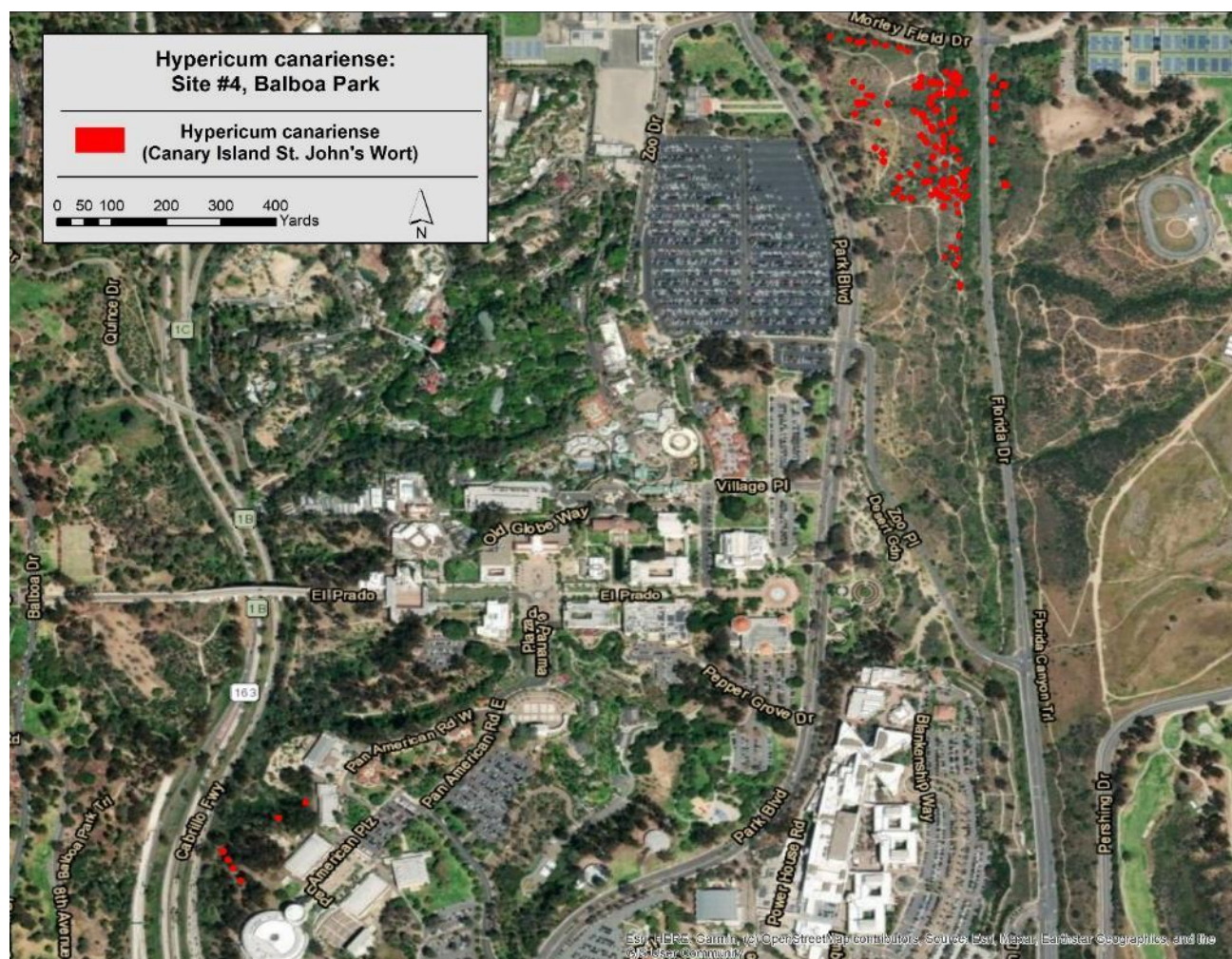


Hypericum canariense, Canary Island St. John's Wort: Site #4 Balboa Park

Table 10. Summary of treatments performed by AWM on *Hypericum canariense*, Canary Island St. John's wort.

| Site Name | Common Name | # of Visits | Acres Treated | Acres Surveyed | Plants treated |
|-----------------------------|-------------------------------|-------------|---------------|----------------|----------------|
| <i>Site #4, Balboa Park</i> | Canary Island St. John's Wort | 1 | 0.4 | 4.3 | 1,620 |

Small plants (40%) and seedlings (60%) were foliar treated with herbicide (Garlon 4 Ultra). The eastern portion of the site was treated the previous quarter. A crew of two individuals visited the site over six days from March 15th to the 29th 2022. Cover is greatly reduced (>90% cover reduction), but there were scattered seedlings still emerging.

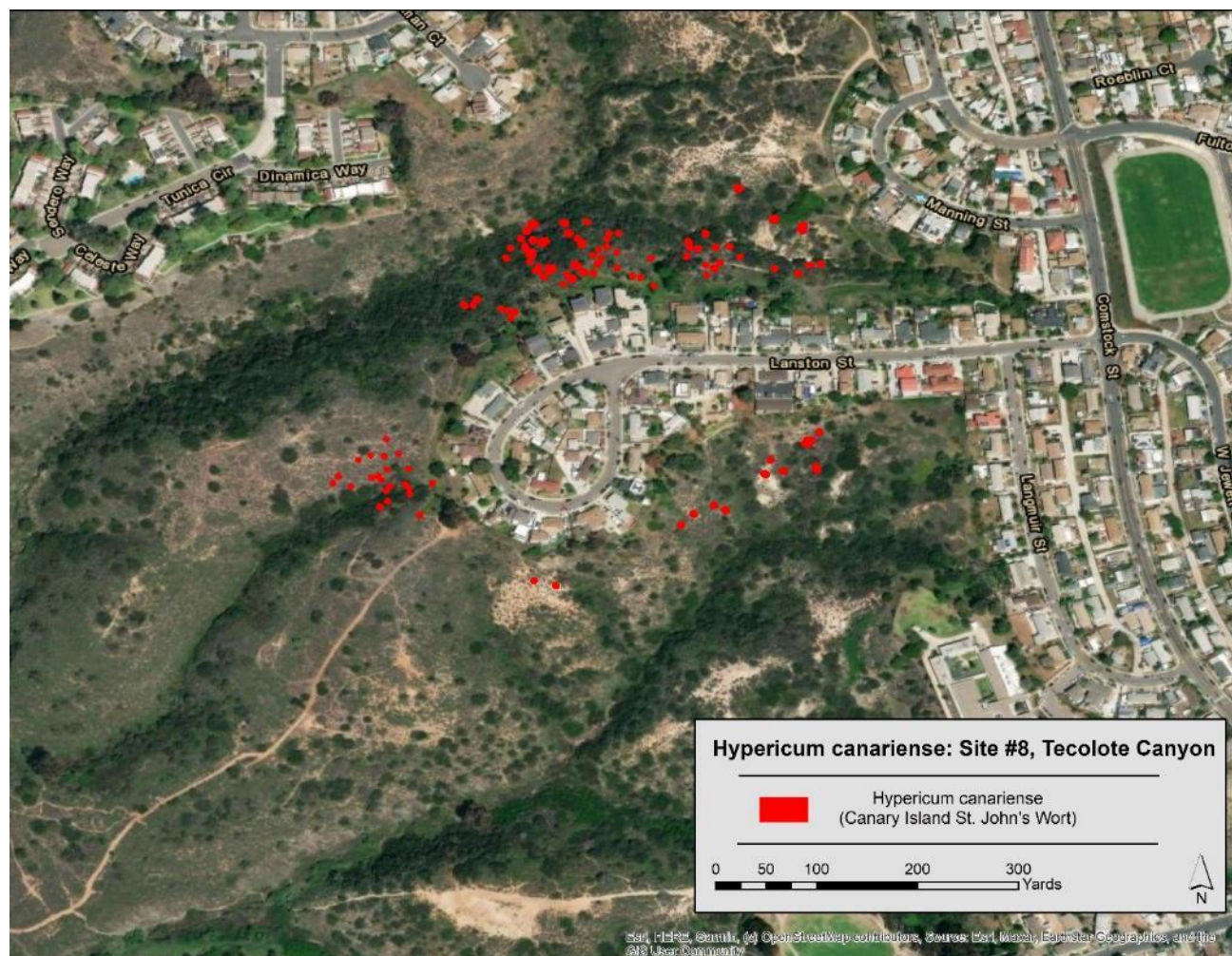


Hypericum canariense, Canary Island St. John's Wort: Site #8 Tecolote Canyon

Table 11. Summary of treatments performed by AWM on *Hypericum canariense*, Canary Island St. John's Wort.

| Site Name | Common Name | # of Visits | Acres Treated | Acres Surveyed | Plants treated |
|-------------------------|-------------------------------|-------------|---------------|----------------|----------------|
| Site #8 Tecolote Canyon | Canary Island St. John's Wort | 1 | 0.2 | 5.2 | 850 |

A crew of two worked four days from April 12th to the 15th 2022. Small plants (40%) and seedlings (60%) were foliar treated with a post emergent herbicide mix with some pre-emergent efficacy (glyphosate/imazapyr); some plants were also treated with triclopyr. Cover is greatly reduced (>95% cover reduction), but there are scattered seedlings and some resprouts still emerging.



Centaurea solstitialis, Yellow Starthistle:

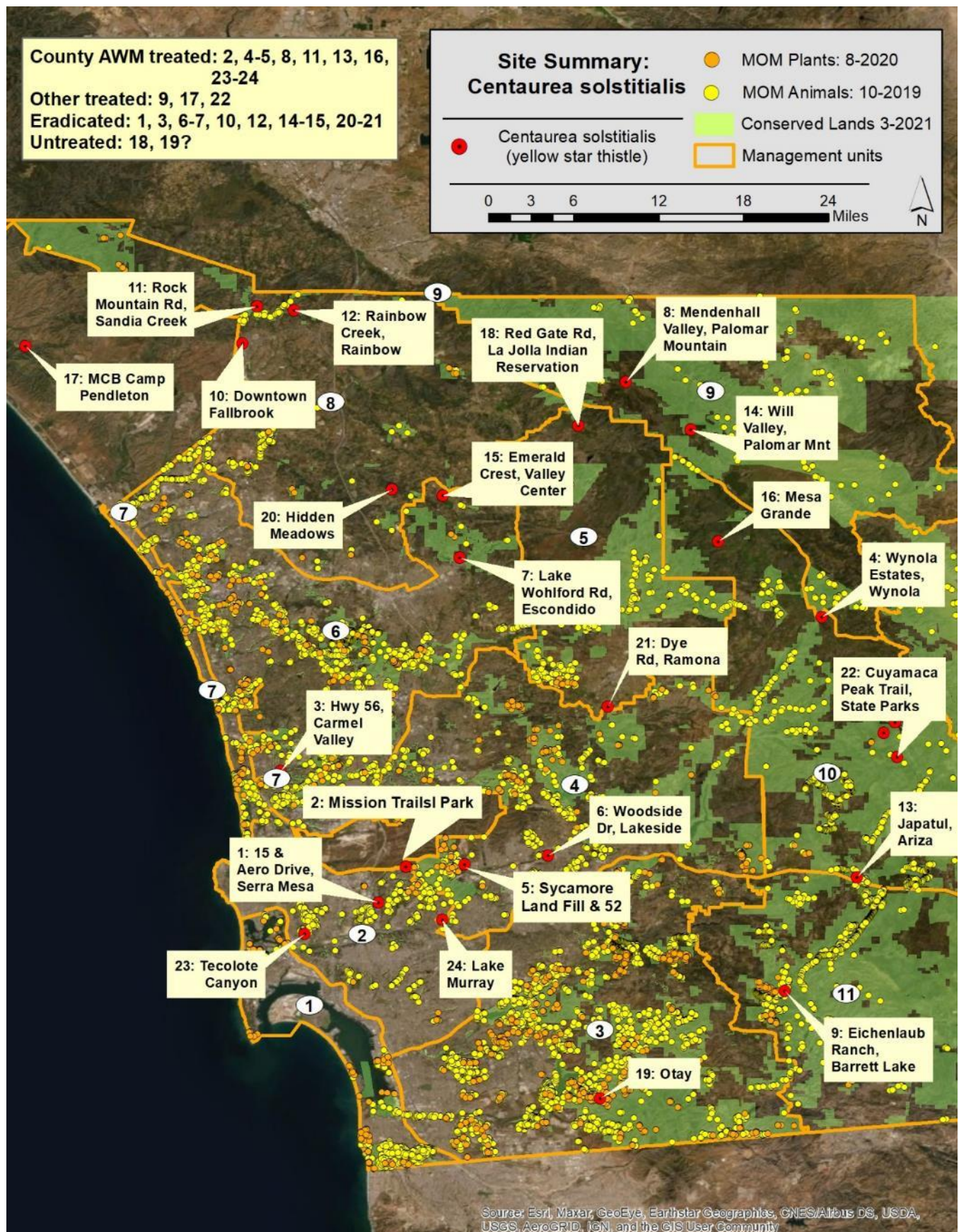
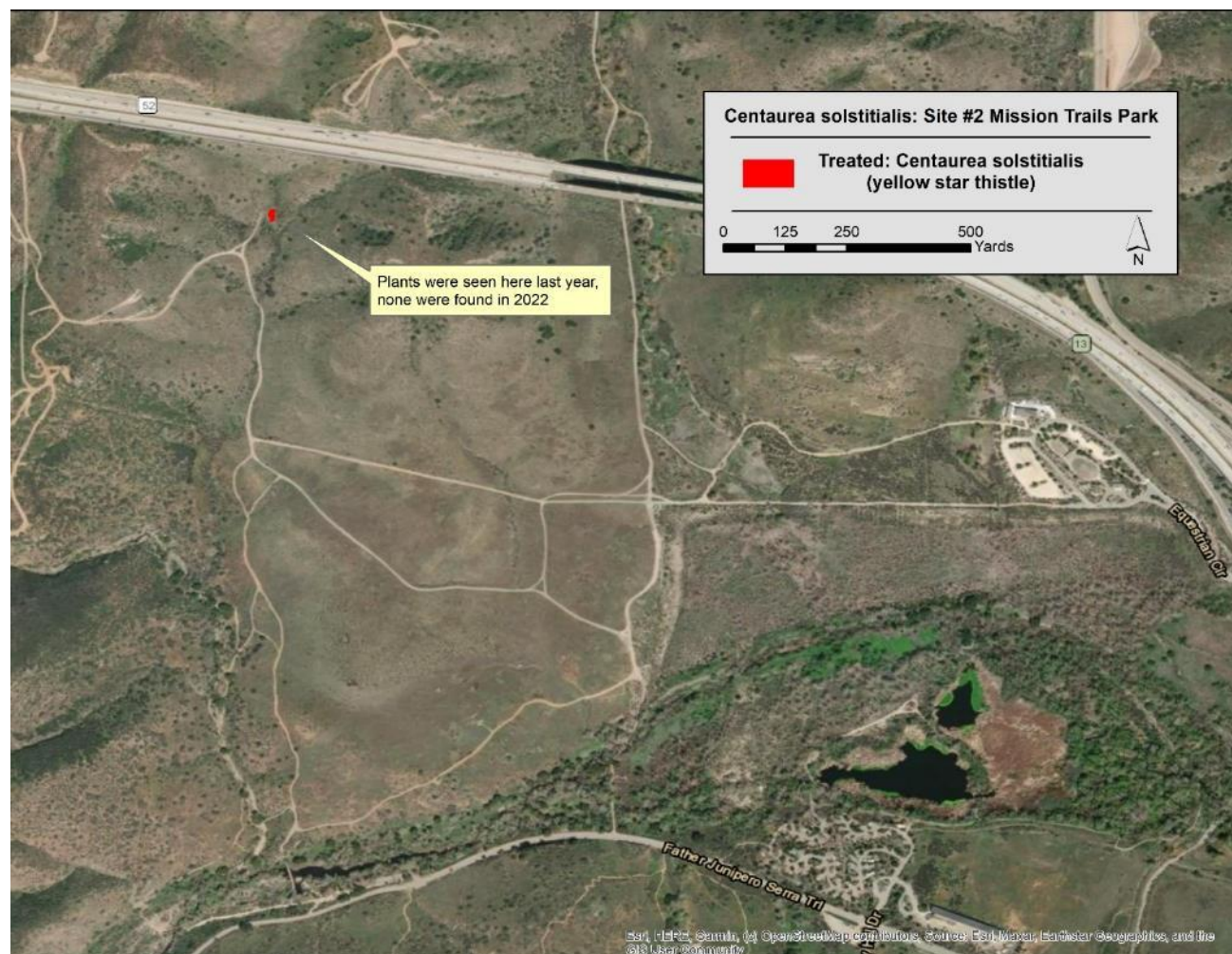


Table 12. Summary of treatments performed by AWM on *Centaurea solstitialis* (Yellow Starthistle).

| Site Name | Common Name | # of Work Cycles | Acres Treated | Acres Surveyed | Plants treated |
|------------------------------------|--------------------|------------------|---------------|----------------|----------------|
| Site #2, Mission Trails, San Diego | Yellow Starthistle | 1 | 0 | 0.5 | 0 |
| Site #4, Wynola Estates, Wynola | Yellow Starthistle | 1 | 0.1 | 0.4 | 35 |
| Site #5, Sycamore Landfill | Yellow Starthistle | 1 | 0.1 | 4.5 | 2 |
| Site #16, Mesa Grande | Yellow Starthistle | 1 | 0.1 | 5.0 | 5 |

***Centaurea solstitialis*, Yellow Starthistle: Site #2, Mission Trails Park**

A crew of two individuals surveyed the site on May 6th 2022. No plants were found. 86 plants were found in patches in 2021.



***Centaurea solstitialis*, Yellow Starthistle: Site #5 Sycamore Landfill**

A crew of one individual visited the site on two days May 3rd and 4th 2022. Two plants were found during a survey of the site, they were pulled and removed. Last year 1 plant was found, and 3 plants were found in 2020.



***Centaurea solstitialis*, Yellow Starthistle: Site #4, Wynola Estates, Wynola**

A crew of two individuals visited the site over one day on June 27th, 2022. 35 plants were found in patches and were removed by hand. 17 plants were found in 2021.



***Centaurea solstitialis*, Yellow Starthistle: Site #16 Mesa Grande**

Five plants were hand pulled by a crew of two on one workday, June 28th, 2022. In 2021 855 plants in scattered patches and were removed by hand or treated with Milestone.



Centaurea stoebe, Spotted Knapweed:

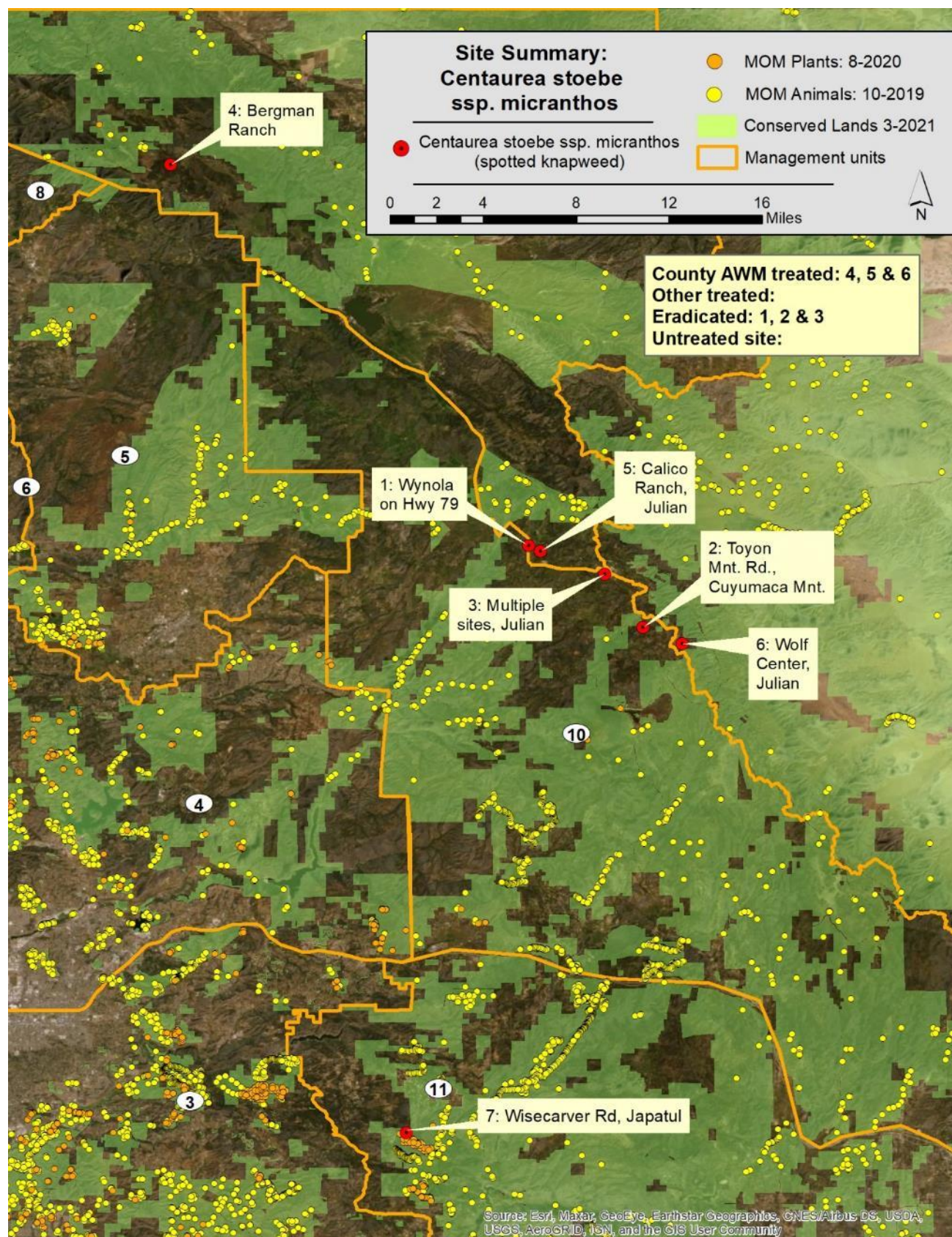


Table 13. Summary of treatments performed by AWM on *Centaurea stoebe* (Spotted Knapweed).

| Site Name | Common Name | # of Visits | Acres Treated | Acres Surveyed | Plants treated |
|------------------------------|------------------|-------------|---------------|----------------|----------------|
| <i>Site #5 Callico Ranch</i> | Spotted Knapweed | 1 | 0.1 | 1.1 | 36 |

***Centaurea stoebe*, Spotted Knapweed: Site #5 Callico Ranch, Julian**

36 plants were treated (foliar sprayed with glyphosate) by a crew of two over two days, July 29th - 30th 2022. 100 plants were treated in 2021.



TASK 4 – AWM: Invasive Plant Level 3 Management.

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

Level 3 Management Species are invasive non-native targets that of a wider distribution in the county (they cannot be eradicated), but still limited enough that they can be contained to portions of the county, or they may be eradicated from watersheds or large landscape level units, when the IPSP was written (2012). These species may also be worked on to suppress them in high resource value areas.

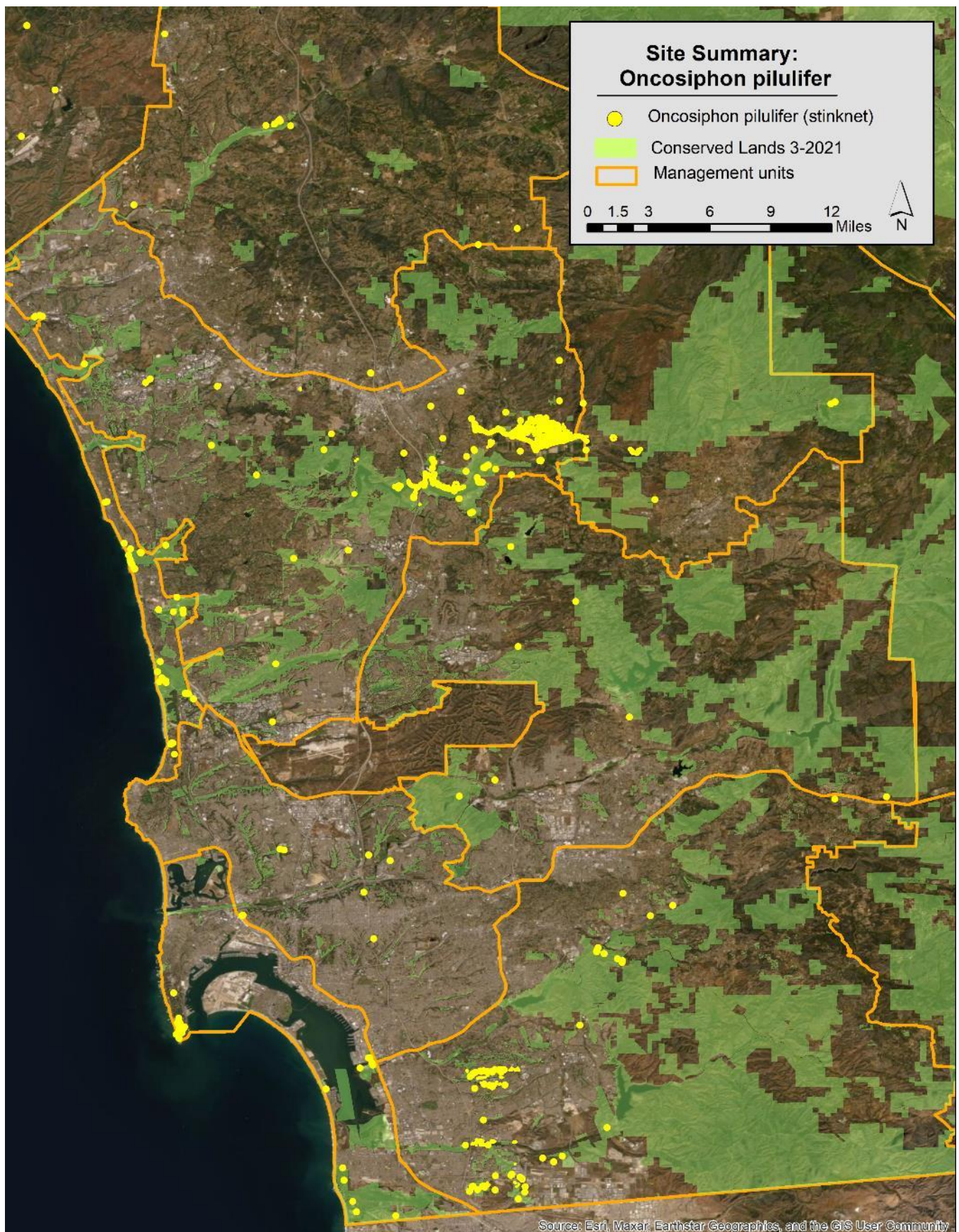
Crews surveyed and treated one invasive weed species (Stinknet) at one site this quarter. AWM IPC made optimal pesticide applications, protected the natural environment by preventing off-site movement of pesticides, and utilized Best Management Practices (BMPs) that prevented unintentional discharges 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 14. Summary of treatments performed by AWM on Level 3 species this quarter.

| Scientific Name | Common Name | # of Sites Worked | Acres Treated | Acres Surveyed | Plants Controlled |
|-----------------------------|--------------------|--------------------------|----------------------|-----------------------|--------------------------|
| <i>Oncosiphon pilulifer</i> | Stinknet | 1 | 0.5 | 0.5 | 2,000+ |

Oncosiphon pilulifer, stinknet:

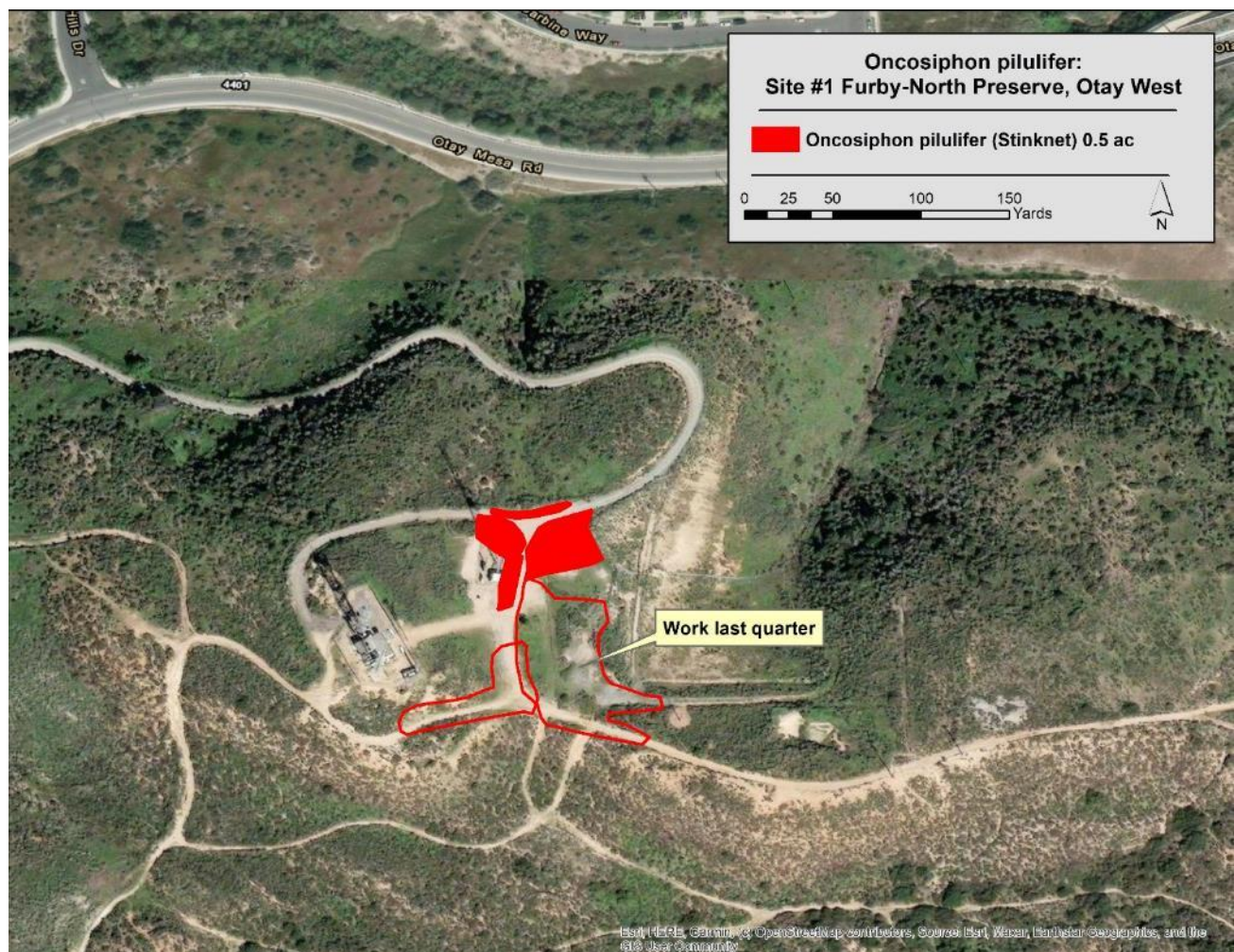


Oncosiphon pilulifer, Stinknet: Site #1 Furby-North, Otay West

Table 15. Summary of treatments performed by AWM on *Oncosiphon pilulifer* (Stinknet).

| Site Name | Common Name | # of Work Cycles | Acres Treated | Acres Surveyed | Plants treated |
|--------------------------------|-------------|------------------|---------------|----------------|----------------|
| Site #1 Furby-North, Otay West | Stinknet | 1 | 0.5 | 0.5 | 2,000+ |

The County AWM crew completed treatments at Furby-North County Preserve. This complimented work that occurred to the east on Caltrans and City of San Diego property. This effort is being initiated to suppress Stinknet in this portion of the county. The area is of high resource value with both vernal pools in the area (not part of this specific site) and occupied cactus wren habitat nearby. The crew foliar treated areas with pre and post emergent. Two crew members worked one day May 1st, 2022. Over 2,000 plants were treated.





Stinknet plants (low plant cover that looks like grass cover, but it has yellow flowers) in disturbed road areas.



Stinknet plants (low plant cover that looks like grass cover, but it has small yellow flowers) in disturbed road areas.

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

Level of Effort: (5%) of overall contract

- Co-ordination to continue control of Ward's Weed in Carlsbad.
- Review (with online confirmation or correction) of reports for EDRR species from iNaturalist.
- Co-ordination with San Diego Weed Management Area at quarterly meeting. Presentation at annual meeting reviewing EDRR and stinknet work.
- Review/consideration of stinknet treatments, primarily on County of San Diego lands. Coordination with SDMMP and Nature Collective staff.

Work Anticipated for 4th Quarter Period, July– September 2022:

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.

- Survey, map, and treat any reported sightings of target Level 2 plants: Spotted Knapweed, Yellow Starthistle, and Limonium.
- Re-treatment of sites: Spotted Knapweed, Yellow Starthistle, Bridal Broom, French Broom, and Limonium.
- 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 State Parks, City 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.
- Present at SDMMP land manager meeting, working group and other meetings as requested.
- Provide population status of EDRR regional targets to CDFA statewide assessment.