

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

**Strategic Control of Invasive Weed Species
3rd Quarter Report - FY 2021-22: Report #29 for Project**

January 1st, 2022 – March 31st 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 January 1st to March 31st 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 new effort this quarter. Coordination with the Port of

San Diego and Caltrans for sea lavender work also occurred in the southern portion of the county on Sweetwater and CVNR/Port property in Chula Vista/National City area.

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

Current work sites were visited and assessed. These include: European sea lavender, Algerian sea lavender, bone seed, Ward's weed, desert knapweed, 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 one invasive weed species (desert knapweed) 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>Volutaria tubuliflora</i>	Desert Knapweed	2	0.7	2.8	96

Volutaria tubuliflora, Desert knapweed:

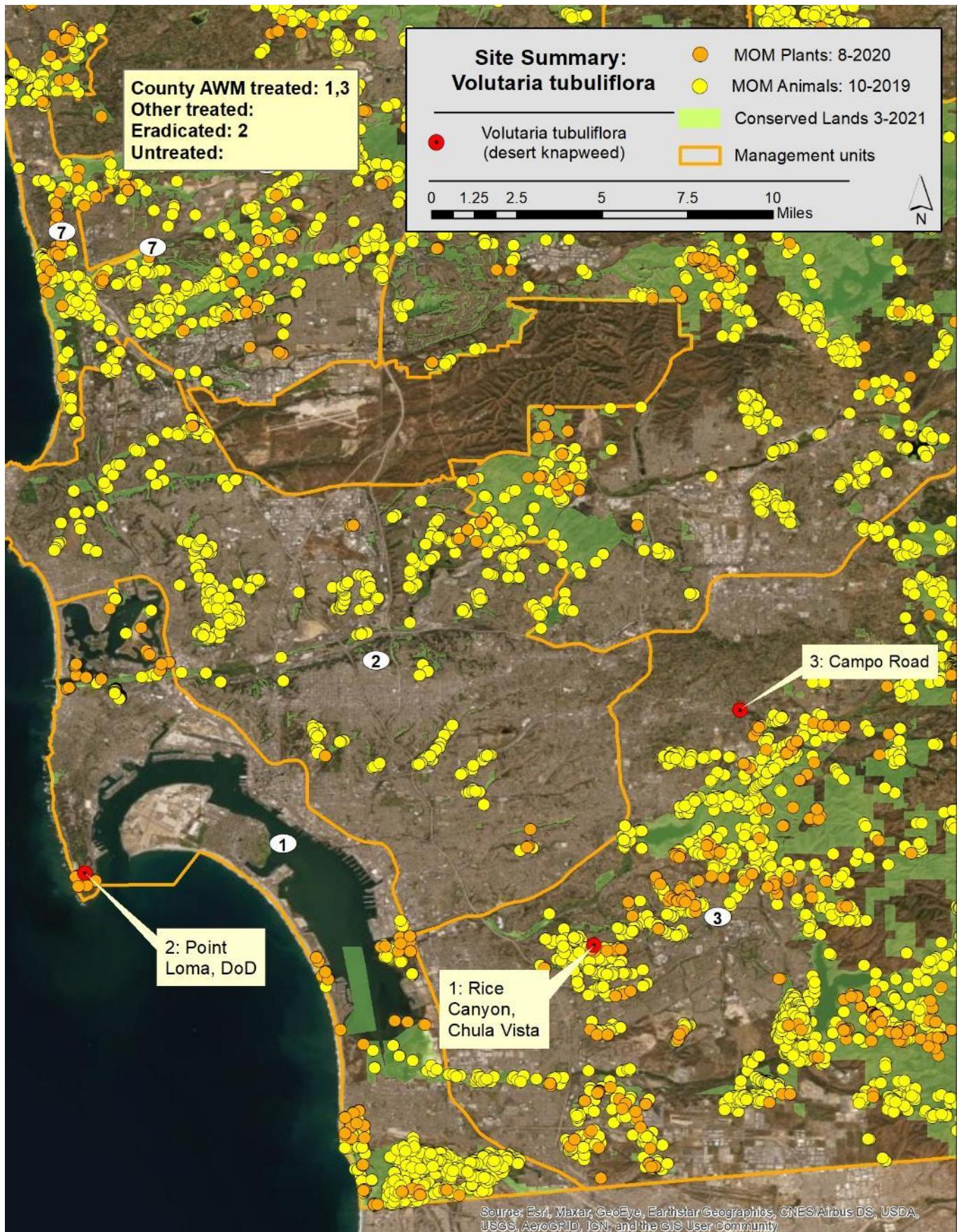


Table 2. Summary of treatments performed by AWM on *Volutaria tubuliflora* (Desert Knapweed).

Site Name	Common Name	# of Work Cycles	Acres Surveyed	Acres Treated	Plants treated
Site #1: Rice Canyon, Chula Vista	Desert Knapweed	2	0.2	0.5	16 pulled

Three separate trips were made to check this site for *Volutaria* plants. Two people surveyed January 7th 2022, 10 plants were pulled from one location. Two people surveyed again on February 18th 2022, 6 plants were pulled.



Table 3. Summary of treatments performed by AWM on *Volutaria tubuliflora* (Desert Knapweed).

Site Name	Common Name	# of Work Cycles	Acres Surveyed	Acres Treated	Plants treated
Site #3 Campo Road	Desert knapweed	1	0.5	0.5	80

This site was treated by a crew of three on January 6th, 2022. A pre/post emergent (Milestone) was used on the site for the second time, 80 plants were observed.



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).

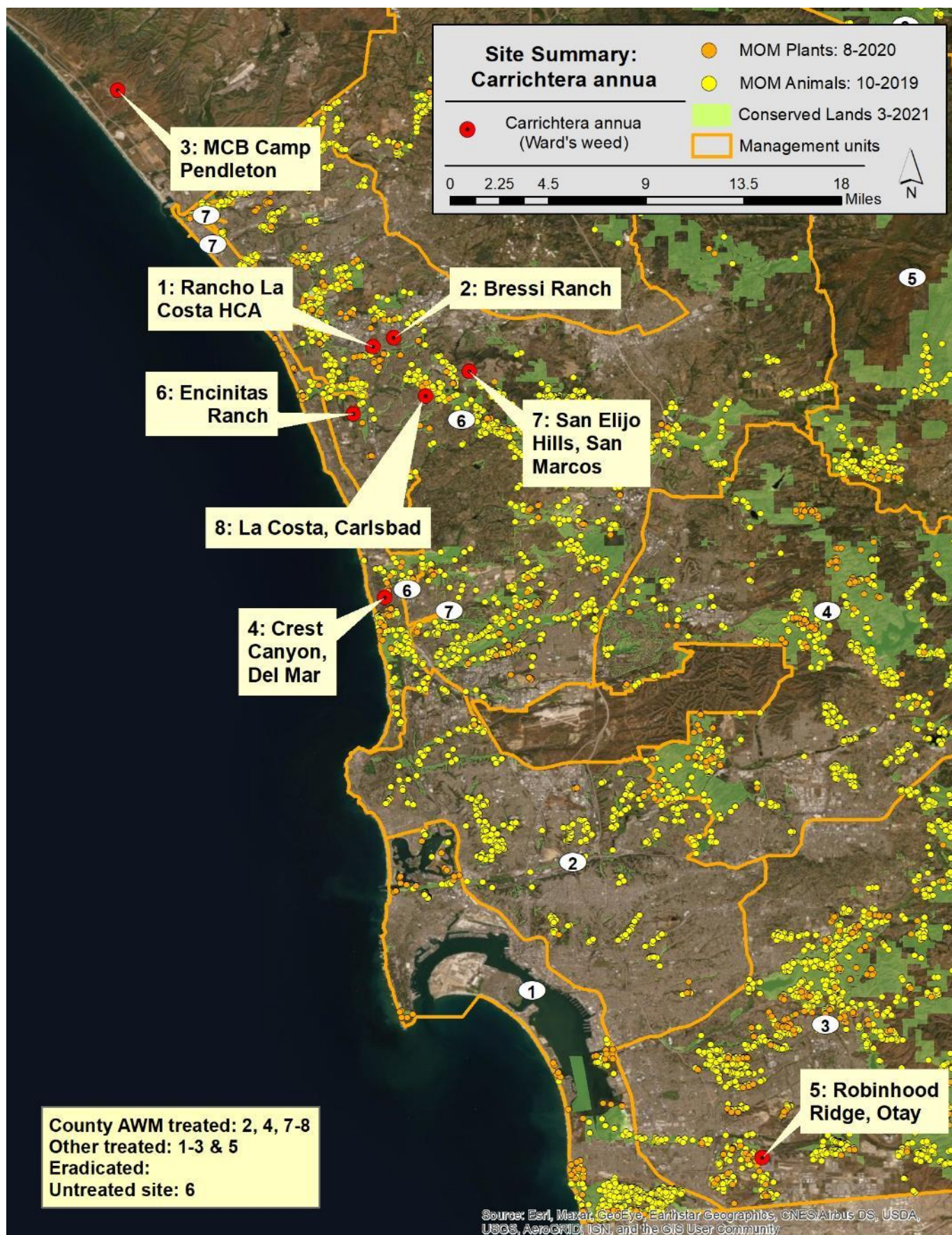
Crews surveyed and treated five invasive weed species (Algerian Sea Lavender, European Sea Lavender, Cary Island Saint John's Wort, Desert Knapweed, Boneseed, and Ward's Weed) at twelve sites this quarter. AWM IPC made optimal pesticide applications, protected the natural environment by preventing off-site 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 4. 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	3	0.4	1.6	255
(<i>Chrysanthemoides</i>) <i>Osteospermum monilifera</i>	Boneseed	1	0.5	2.8	97
<i>Hypericum canariense</i>	Canary Island St. John's Wort	1	0.9	5.35	1,880
<i>Limonium duriusculum</i>	European Sea Lavender	3	3.3	12.55	21,465
<i>Limonium ramosissimum</i>	Algerian Sea Lavender	2	0.8	2.4	1,200

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



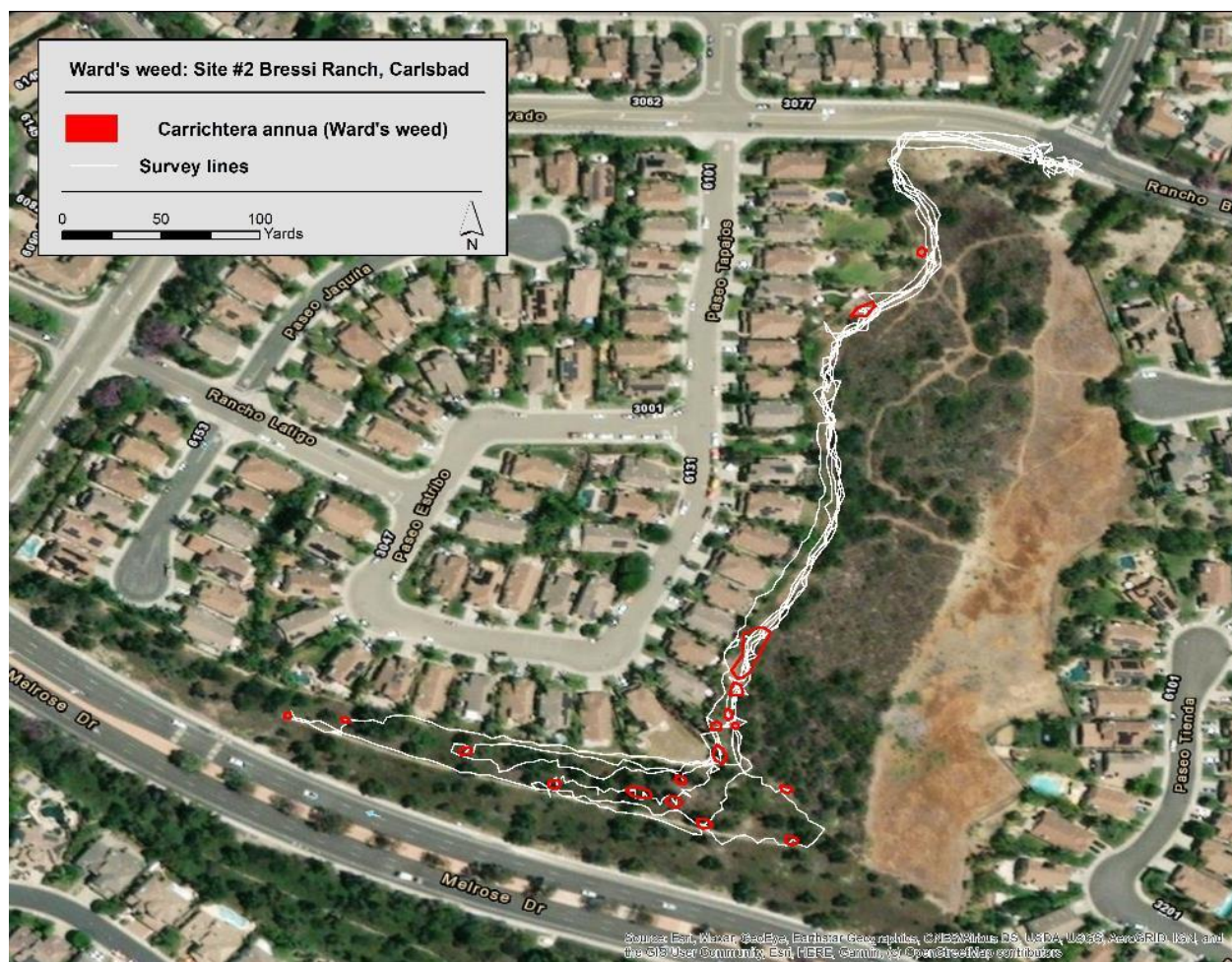
Carrichtera annua, Ward's Weed, Site #2 Bressi Ranch

Table 5. 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	0.2	0.5	200

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) was applied to the site in winter 2020/2021 and 2021/2022.

County AWM crews treated most of the site in December, one day in January was worked to complete the site. A crew of 2 personnel spent 1 day in January treating the area. Funding was from CDFA for this workday.



Carrichtera annua, Ward's Weed, Site #8 La Costa, Carlsbad

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 #8 La Costa, Carlsbad	Wards Weed	1	0.1	0.6	15

This is a newer site first identified by an iNaturalist report in early 2021. The site footprint was treated for the first time with Gallery pre-emergent herbicide by a crew of two on November 3rd 2021. Fifteen plants were observed and spot treated with glyphosate and pre-emergent on March 3rd 2022 by a crew of two.

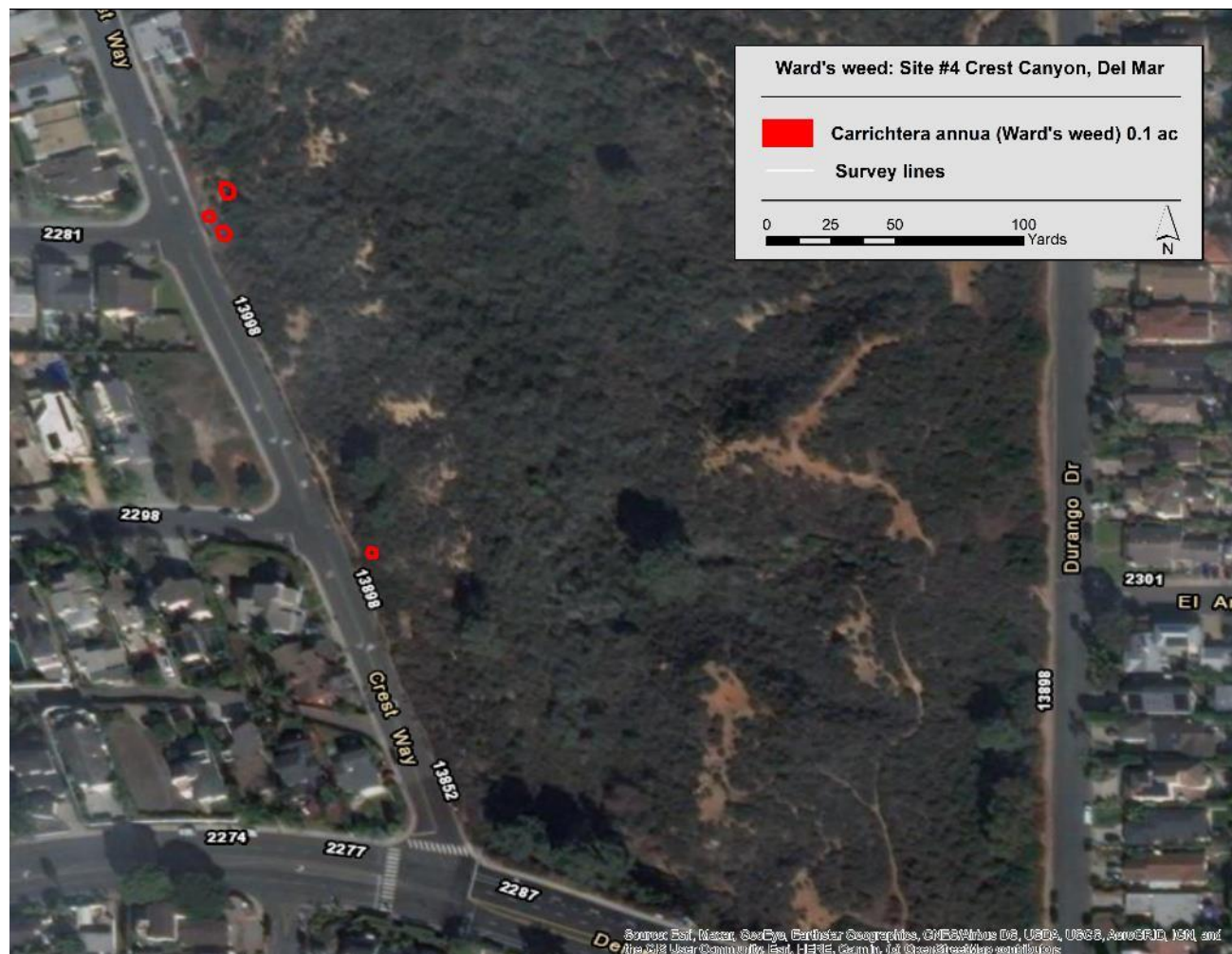


Carrichtera annua, Ward's Weed, Site #4 Crest Canyon, Del Mar

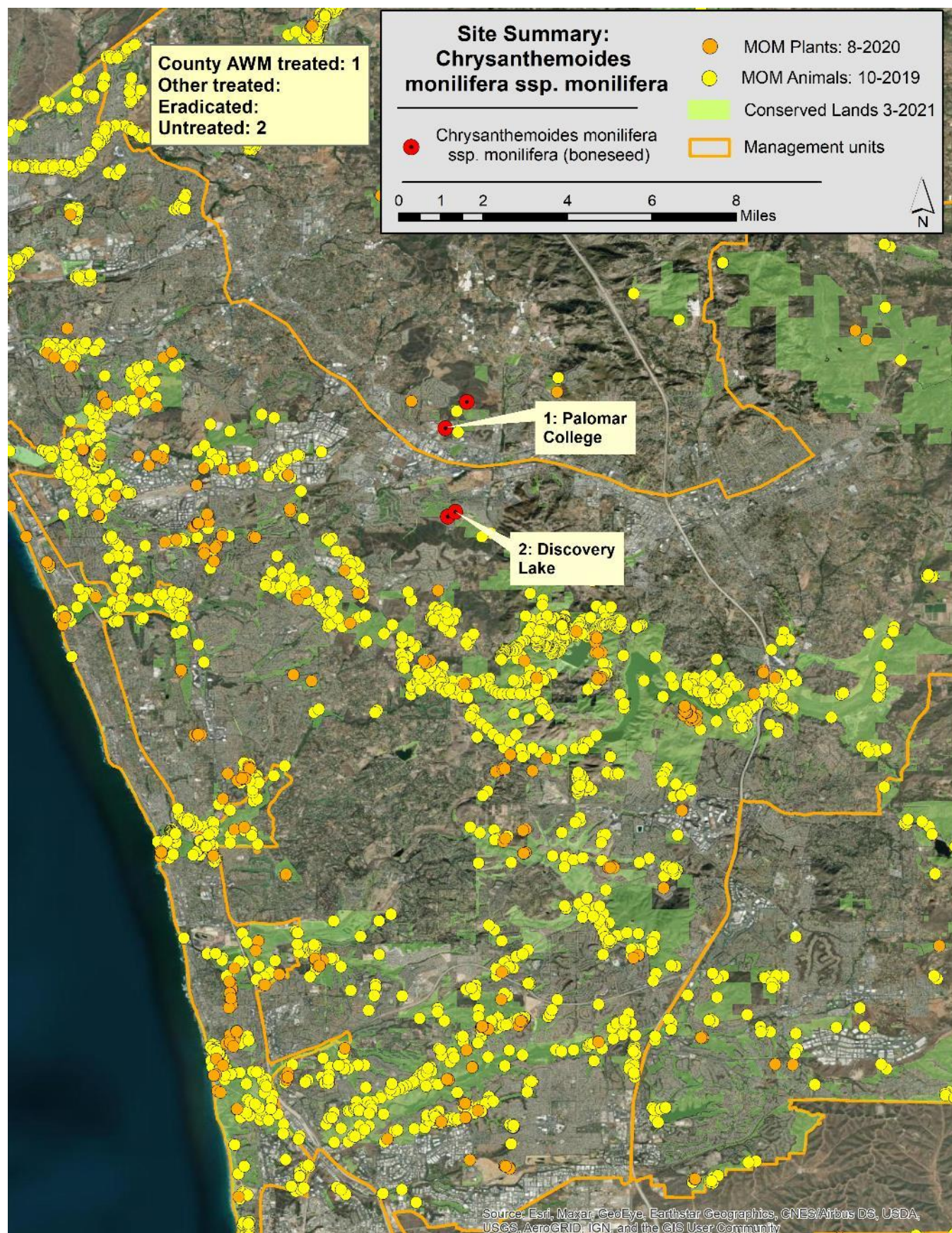
Table 7. Summary of treatments performed by AWM on *Carrichtera annua*, Ward's Weed.

Site Name	Common Name	# of Work Cycles	Acres Treated	Acres Surveyed	Plants treated
Site #4, Crest Canyon, Del Mar	Wards Weed	1	0.1	0.5	40

This site was treated twice in 2021 with pre-emergent (Gallery). No plants were seen in late 2021, but a crew of three individuals surveyed and hand pulled 40 plants on January 4th 2022.



Chrysanthemoides (Osteospermum) monilifera, Boneseed:



Chrysanthemoides (Osteospermum) monilifera, Boneseed: Site #1 Palomar College, San Marcos

Table 8. 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 #1 Palomar College, San Marcos	European Sea Lavender	1	0.5	2.8	97

Boneseed is native to South Africa; it is a highly invasive shrub in Australia where it is widely distributed. Since we share a similar ‘Mediterranean’ climate with these areas, it was decided that the known source population for our county, at Palomar College Arboretum, should be treated. New plants were recently (2021) observed in San Marcos open space, several miles south of the Palomar College location (Site #2 Discovery Lake, this site is still being worked on for access). The Arboretum has been actively suppressing the plant for over 10 years. A crew of two individuals treated for 7 days (January 1st – 20th, 2022). A total of 97 shrubs from 6” to 6’ tall were cut and treated (Garlon). A pre-emergent was also applied to the soil to suppress future seedbank expression. Some sites had a carpet of seeds from years of production.



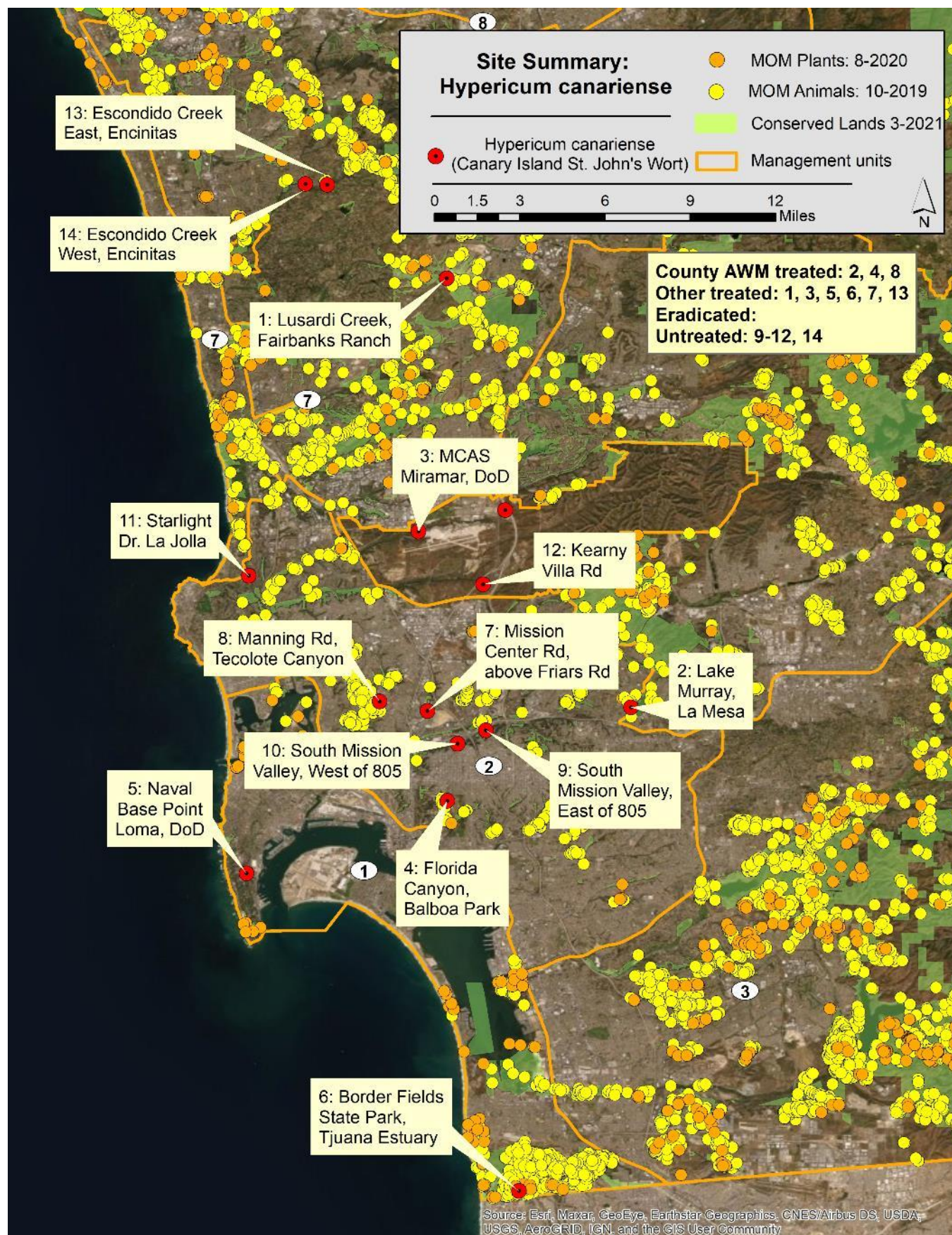


Large boneseed plants in center of photo.



Boneseed seedlings and seeds (look like round pepper corns).

Hypericum canariense, Canary Island St. John's Wort

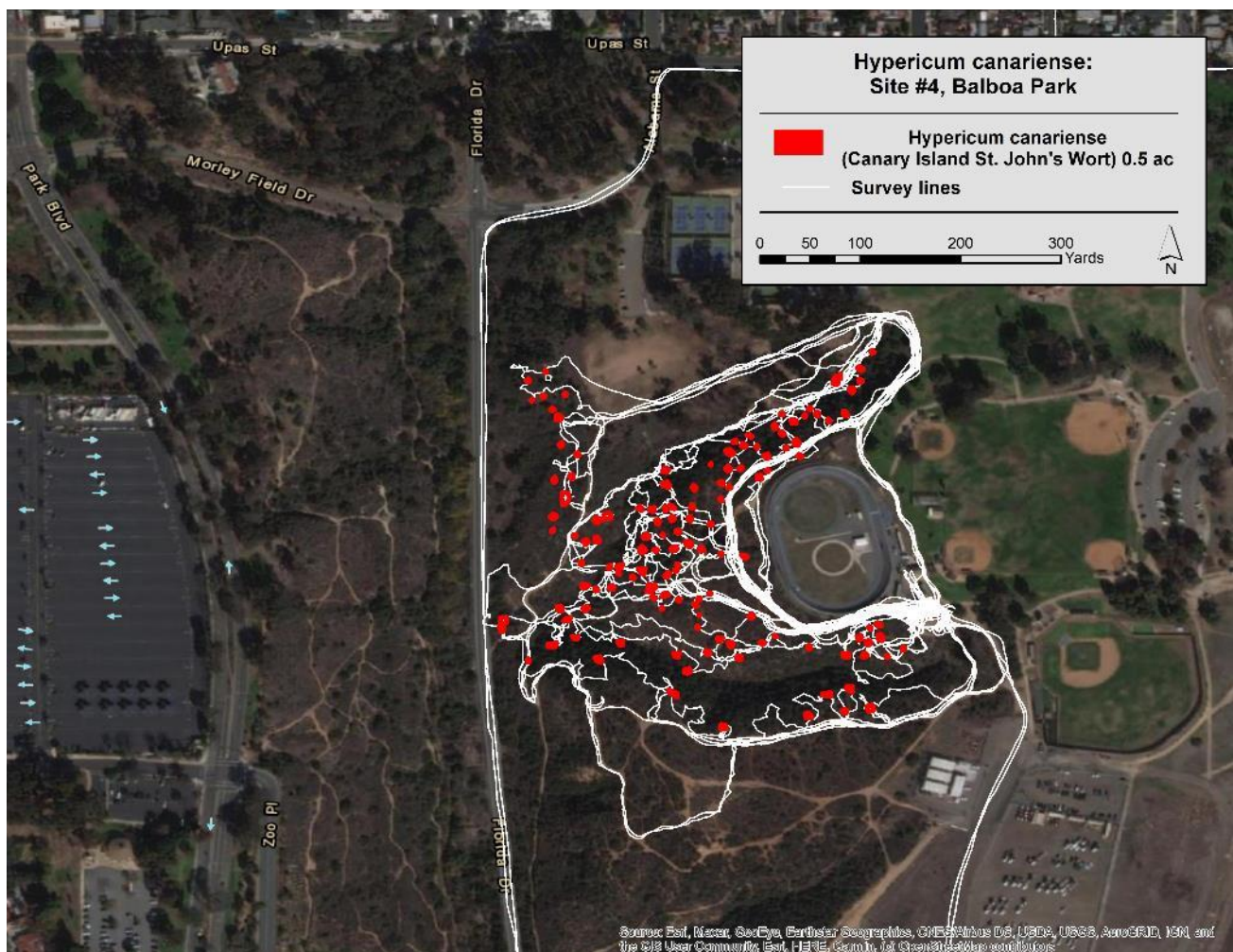


Hypericum canariense, Canary Island St. John's Wort: Site #4 Balboa Park

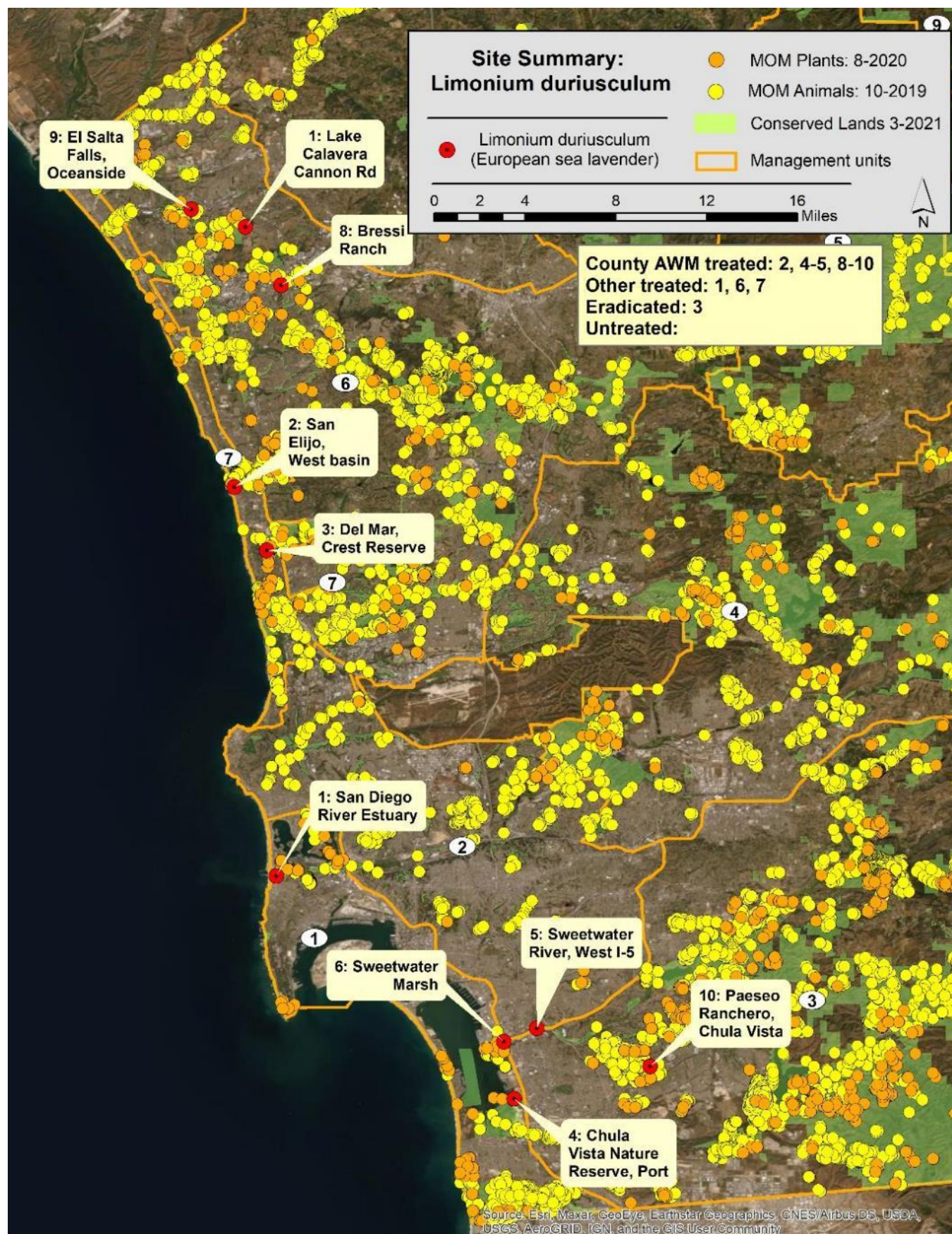
Table 9. Summary of treatments performed by AWM on *Hypericum canariense*, Canary Island St. John's Wort.

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
Site #4, Balboa Park	Canary Island St. John's Wort	1	5.35	0.9	1,880

Small plants (40%) and seedlings (60%) were foliar treated with herbicide (garlon). A crew of two individuals visited the site over eight days from March 15th to the 29th 2022. Work on the east side of Florida Canyon continued into Q4 2021-22. Cover is greatly reduced (>90% cover reduction), but there were scattered seedlings still emerging.



***Limonium duriusculum*, European Sea Lavender:**



Limonium duriusculum, European Sea Lavender: Site #2 San Elijo, Solana Beach

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 #2 San Elijo, Solana Beach	European Sea Lavender	1	0.1	0.2	15

15 seedlings were hand pulled and bagged. A crew of three individuals worked one day January 4th 2022. Cover is greatly reduced in past treatment areas (>90% cover reduction), but there are a few seedlings sprouting. This site is almost eradicated for the species.



Limonium duriusculum, European Sea Lavender: Site #5 Sweetwater River, Chula Vista

Table 11. 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 #5 Sweetwater River, Chula Vista	European Sea Lavender	1	2.9	8.25	17,600+

This is a new treatment area above Sweetwater River which then drains into southern San Diego Bay. These are disturbed slopes on Caltrans property below highway 54 on both the north and south sides of the river. Dense cover of plants was observed and treated (see photos). Over 17,600 mature plants were foliar treated by a crew of two individuals over four days (February 9th to 28th 2022) using a mix of pre and post emergent herbicide (glyphosate and Gallery). Last quarter sections of the river were treated, this should help reduce seed dispersal into south San Diego Bay.





Dense cover of European Sea Lavender, in grass areas on slope.



Dense cover of European Sea Lavender, in open substrate on slope.

Limonium duriusculum, European Sea Lavender: Site #6 Chula Vista Nature Reserve, Port SD

Table 12. Summary of treatments performed by AWM on *Limonium duriusculum* (European Sea Lavender).

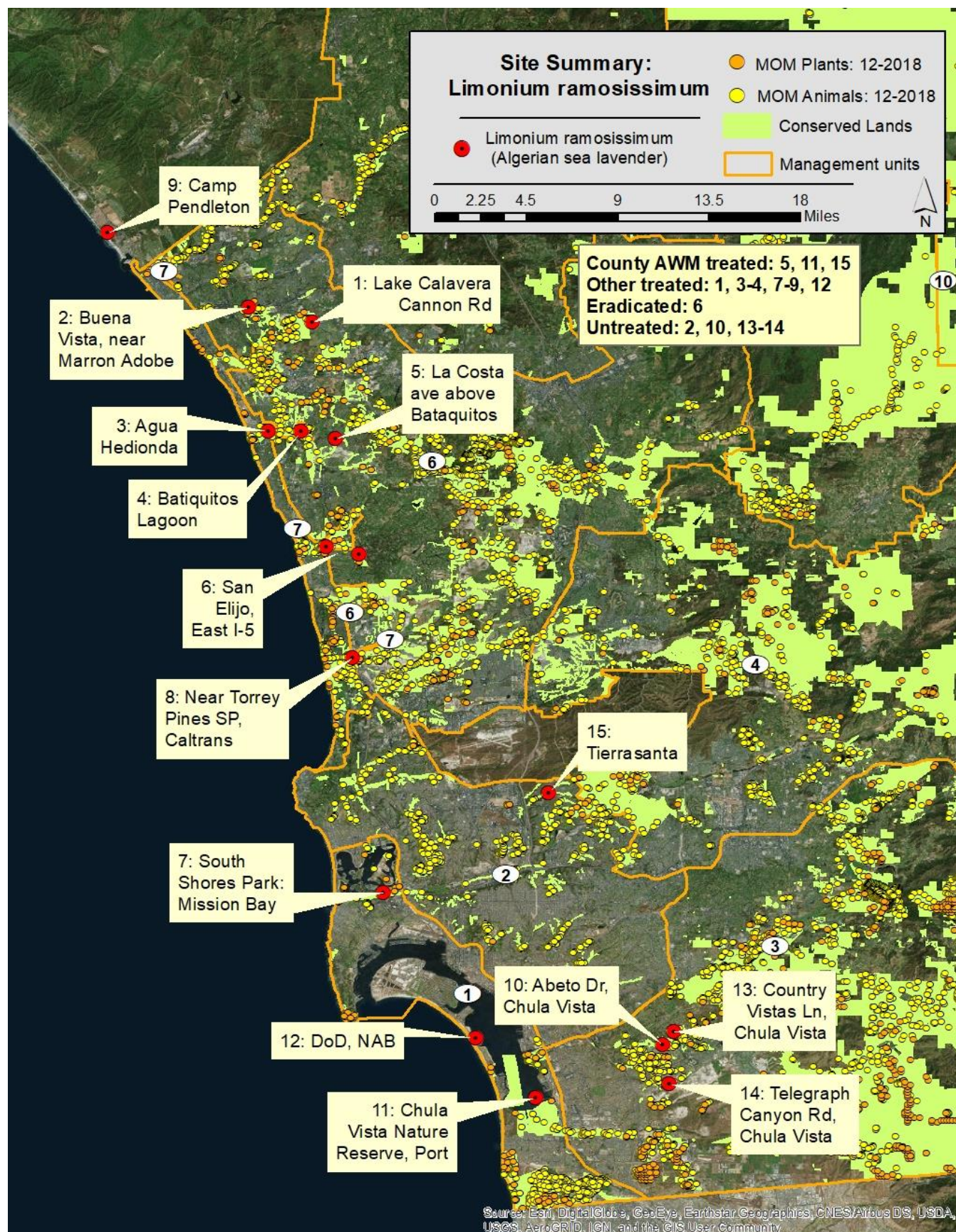
Site Name	Common Name	# of Work Cycles	Acres Surveyed	Acres Treated	Plants treated
Site #6, CVNR, Port SD	European Sea Lavender	1	0.3	3.8	3,850

Mature plants and seedlings were treated. A crew of two individuals worked 12 days from 2-7 to 2-29-2022. The site has not been treated for two years; plants have rebounded strongly. The crew now uses an herbicide mix (glyphosate and imazapyr) to hopefully obtain better control, but the seedbank is very persistent. Some tarping is occurring on the west side of the distribution, but strong winds tend to lift the tarps.





Limonium ramosissimum, Algerian Sea Lavender:



Limonium ramosissimum, Algerian Sea Lavender: Site #5 La Costa Ave Carlsbad

Table 13. 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 #5 La Costa, Carlsbad	Algerian Sea Lavender	1	0.2	0.5	220

This was the fifth treatment of this site that was initially dense mats of plants. Initial control was very good at over 95%, but seedlings are still sprouting. In June 2021 2,000 seedlings were found and Gallery was used for the first time to try and suppress this persistent seedbank. It seems to have helped as 220 seedlings were found on January 5th 2022 when the site was visited. This was a fairly early visit though, so not all seedlings for the season may have been expressed. A crew of three individuals worked one day January 5th 2022. They treated with glyphosate and imazapyr.

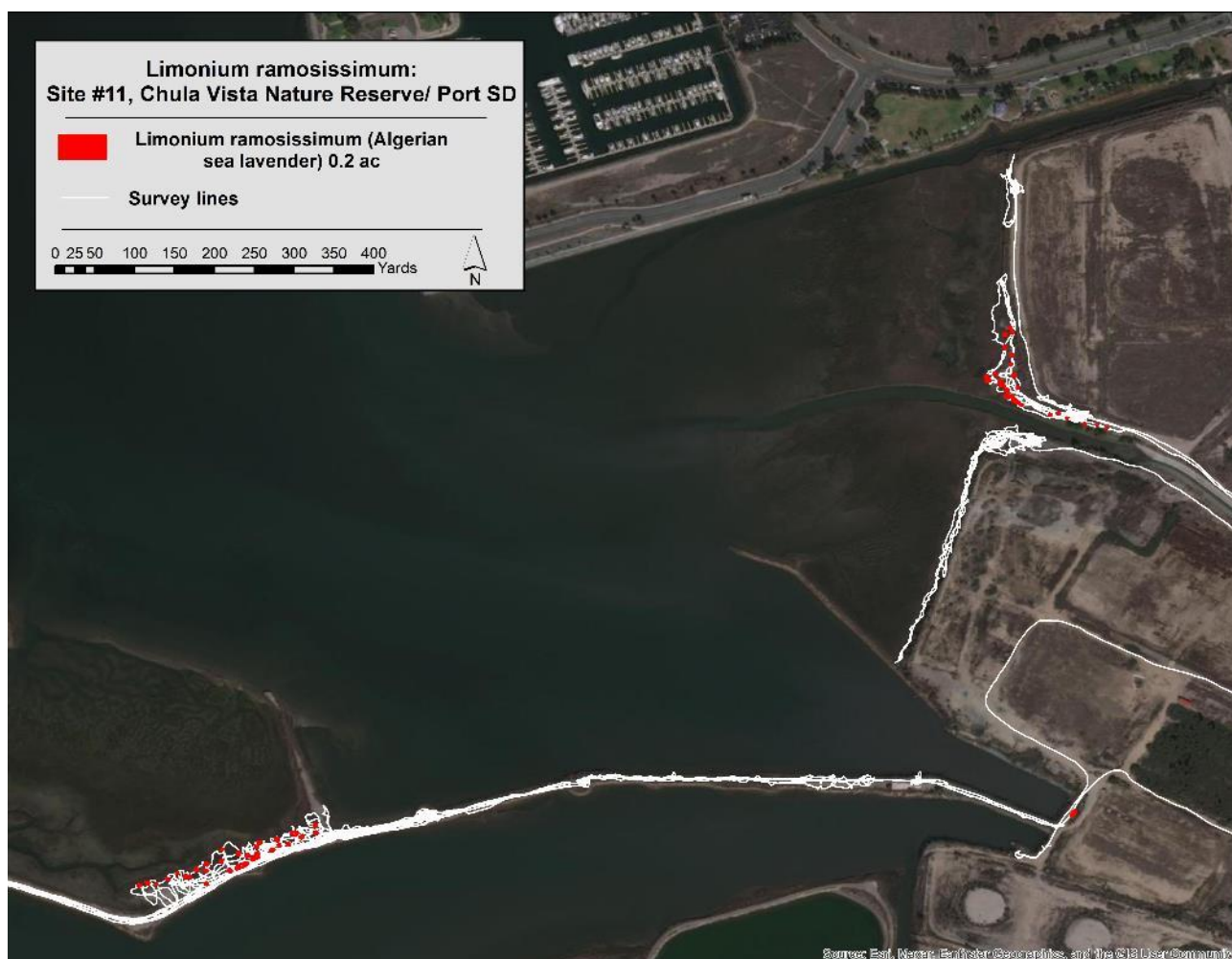


Limonium ramosissimum, Algerian Sea Lavender: Site #11 Chula Vista Nature Reserve

Table 14. 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 #11 CVNR, Chula Vista	Algerian sea lavender	1	0.2	2.4	980

This site was treated for several years in a row and then no treatments occurred for two years. Treatments in 2022 were by a crew of two over three days from January 21st and February 1-2nd. On the western portion of the site plants were large and were pulled. In the northeastern area, near a small creek outfall, plants were treated with glyphosate and imazapyr. Even with imazapyr, which has some seedbank suppression, plants continue to germinate from a well-established seedbank. Overall plant cover is definitely reduced, by over 90%, but ongoing treatments are needed to fully deplete the seedbank.





Pulled mature Algerian Sea Lavender, these were scattered plants.



Patch of Algerian Sea Lavender, these were spot treated.

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.

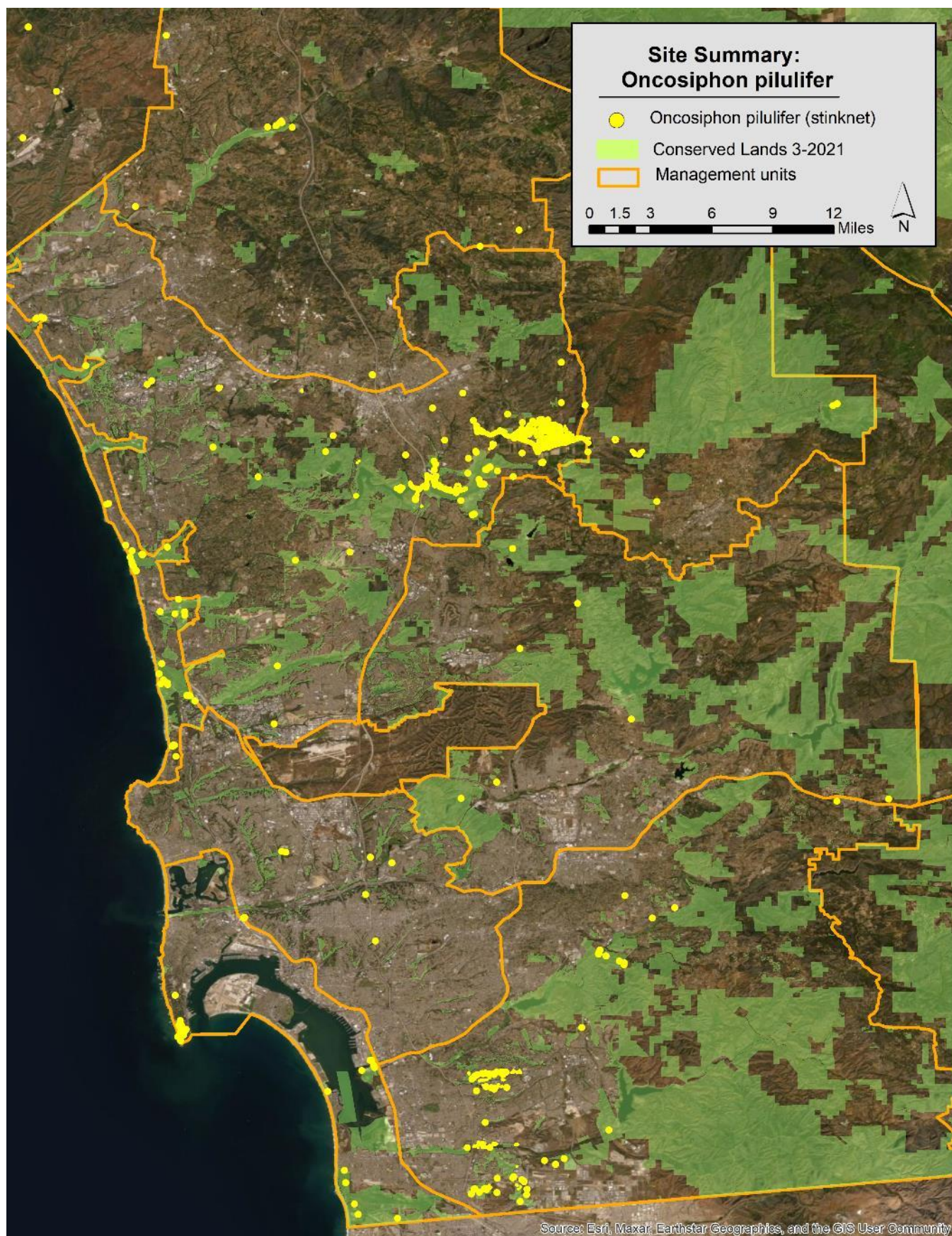
Crews surveyed and treated one invasive weed species (stinknet) at one site this quarter. AWM IPC made optimal pesticide applications, protected the natural environment by preventing off-site movement of pesticides, and utilized Best Management Practices (BMPs) that prevented unintentional discharges 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 15. 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	1.4	4.25	6,000+

***Oncosiphon pilulifer*, Stinknet:**



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

Table 16. 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	1.4	4.25	6,000+

The County AWM crew treated 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.





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.



Stinknet plants (low plant cover that looks like grass cover, but it has 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 (confirmation or correction) of reports for EDRR species from iNaturalist.
- Co-ordination with San Diego Weed Management Area at quarterly meeting.
- Co-ordination to survey and control European and Algerian Sea Lavender species in South San Diego Bay. Managers from FWS, DoD, SDMMP and CBI discussed expanded and coordinated surveying and treatment. Existing location data will be aggregated, new surveying in summer 2022 will occur, treatments in some areas will also occur.
- 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, April – June 2022:

This work will be under a new Agreement.

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 knap weed, yellow star thistle, and Limonium.
- Re-treatment of sites: spotted knapweed, yellow star thistle, 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.