

# **-Draft-**

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

### **Strategic Removal of Invasive Weed Species *3<sup>rd</sup> Quarter Report - FY 2016-17: Report #9 for Project***

**January 1, 2017 – February 28, 2016 (contract end date)**

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 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:

#### **TASK 1 – Invasive Plant Species Coordinator:**

Level of Effort: (25%) of overall contract

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

Coordinating with property owners and land managers and AWM crew occurred throughout the quarter.

##### **The coordinator worked on four species at five field sites:**

Work tasks included monitoring field crews, assessing treatment success, hand pulling plants, and mapping and surveying target plants. Maps for these sites are found in the treatment section of the report. Work also occurred on treatment planning and time estimates for Amendment #1.

*Hypericum canariense* (Canary Island St. John's wort):

Site #4, Balboa Park was visited on 1-7-17 and with the treatment crew on 1-25-17.

Site #2, Lake Murray was visited on 2-1-17.

*Limonium duriusculum* (European sea lavender) and *Limonium ramosissimum* (Algerian sea lavender):

Site #2, Chula Vista Nature Reserve (CVNR) was visited on 2-6-17 and with the treatment crew on 2-8-17.

*Volutaria tubiliflora* (Volutaria knapweed):

Site #1, Chula Vista Rice Canyon was visited with the treatment crew on 2-8-17.

**Report preparation:**

Quarterly report for Q3 2016-17 was prepared. Two year project report was prepared. Work on the new contract scope occurred.

**GIS data:**

Spatial data was updated and is being uploaded on Calflora. Data will be delivered to SDMMP staff in Q3 2016-17.

**Work plan 2017-18:**

The work plan for 2017-2018 was initiated.

## **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).

No work occurred on Level 1 Management Species this Quarter.

## **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: European sea lavender, Algerian sea lavender, and bridal broom. 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 1. Summary of treatments performed by AWM on Level 2 species this quarter.**

<b>Scientific Name</b>	<b>Common Name</b>	<b># of Sites Worked</b>	<b>Acres Surveyed</b>	<b>Acres Treated</b>	<b>Plants Controlled</b>
<i>Hypericum canariense</i>	Canary Island St. John's Wort	2	42.7	8.6	6,340
<i>Limonium duriusculum</i>	European sea lavender	1	8.2	2.6	27,750
<i>Limonium ramosissimum</i>	Algerian sea lavender	2	7.0	4.0	2,670
<i>Genista monspessulana</i>	French broom	1	1.0	-	-
<i>Carrichtera annua</i>	Ward's weed	1	12	3.1	>35,000
<i>Volutaria tubilflora</i>	Volutaria	1	1.3	0.8	>5,000

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



**Table 2. 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	10.7	1.45	440

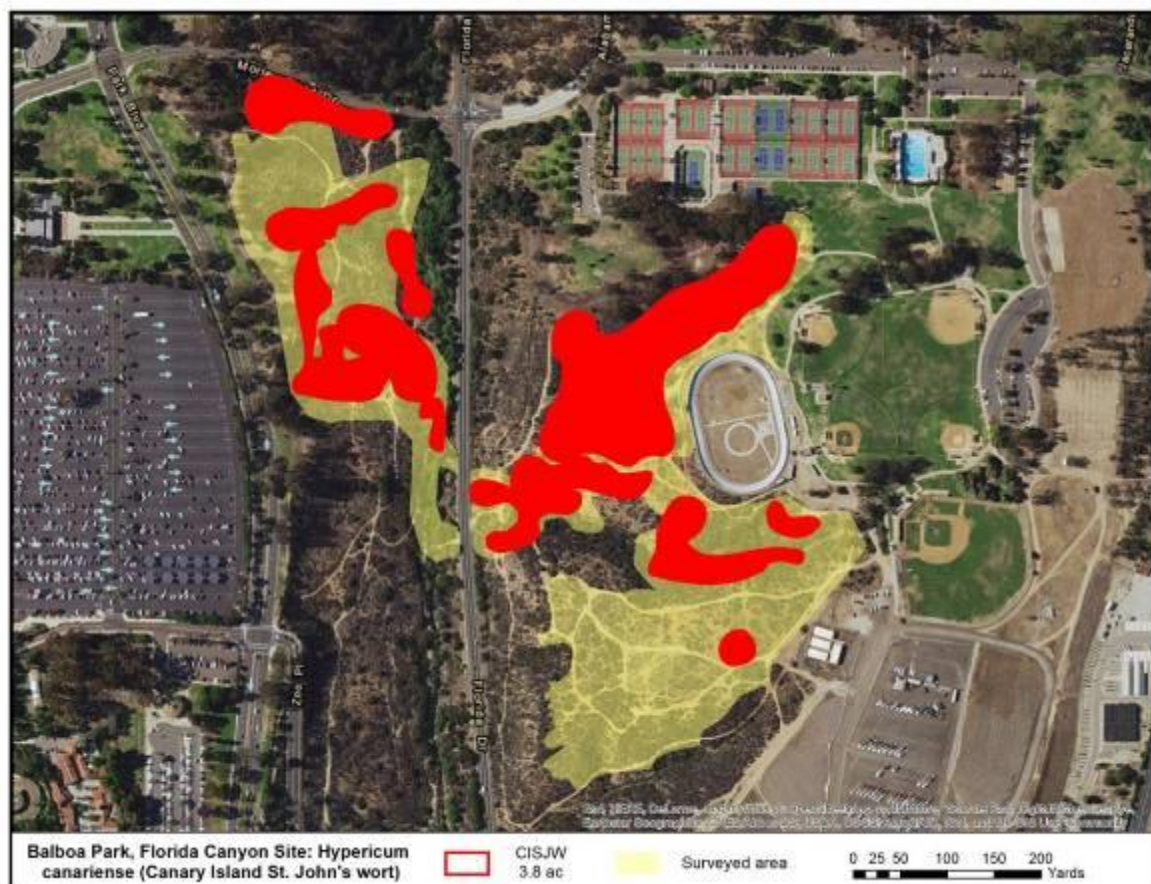
Re-sprouting plants and seedlings were treated with herbicide (Element 4). A crew of two individuals visited the site over two days 2/23/17 and 2/24/2017. Cover is greatly reduced (>90% cover reduction), but there were scattered re-sprouts and seedlings.





Re-sprouting *Hypericum canariense*.

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



**Table 3. 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	32	7.1	5,900

Re-sprouting plants and seedlings were treated with herbicide (Element 4). A crew of two individuals visited the site over seven days 1/25-26/2017, 2/1-3/2017, 2/6/2017, 2/21/2017. Cover is significantly reduced (>85% cover reduction), but there were many scattered re-sprouts and seedlings.



Re-sprouting *Hypericum canariense*.



Foliar sprayed stand of *Hypericum canariense*, nearly 100% control.





Treated re-sprouting *Hypericum canariense*.

**Limonium duriusculum, European sea lavender: Site #2 San Elijo Lagoon**

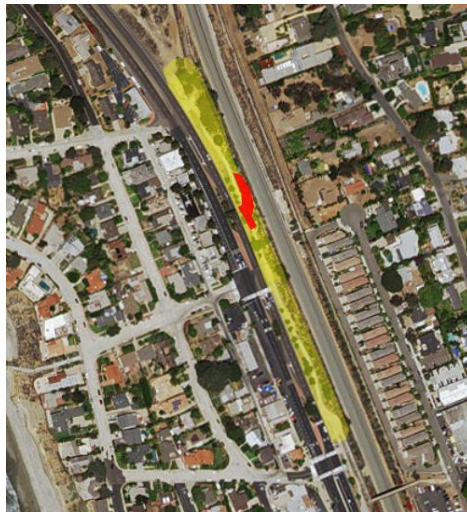




**Table 4. Summary of treatments performed by AWM on *Limonium duriusculum* (European sea lavender).**

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
Site #2: Highway 101, Solana Beach	European sea lavender	1	2.0	0.7	50

Seedlings were pulled and disposed of. A crew of two individuals worked on 1/12/17. Cover is greatly reduced (>95% cover reduction), but there are seedlings sprouting (50).



San Elijo Lagoon along Highway 101 site: Red areas were treated, yellow areas were surveyed.



Seedlings that were hand pulled.



***Limonium duriusculum*, European sea lavender: Site #12 Chula Vista Nature Reserve**



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

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
<i>Site #12: Chula Vista Nature Reserve</i>	European sea lavender	1	8.2	2.6	>27,000

**Table 6. Summary of treatments performed by AWM on *Limonium ramosissimum* (Algerian sea lavender).**

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
<i>Site #12: Chula Vista Nature Reserve</i>	Algerian sea lavender	1	5.0	4.0	2,670

Mature plants and seedlings were treated with glyphosate and Imazapyr. A crew of two individuals worked six days on 2/8-10/17 and 2/14-16/17. Rain events complicated and delayed work. Work in estuary areas was, however, completed before avian nesting restricted work activities. Cover is greatly reduced in many areas (>90% cover reduction), but there are seedlings sprouting and new areas were treated for the first time (areas further from the estuary). Additional areas that were not accessible due to SDG&E construction will be treated next quarter.





European sea lavender seedlings and dead plants.



European sea lavender seedlings and dead plants.



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



**Table 7. 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 #2: <i>Carrichtera annua</i>	Ward's weed	1	12.0	3.1	35,000

Mature plants and seedlings were treated with glyphosate and or Telar. Plants at the western site were hand pulled. A crew of two individuals surveyed and treated over six work days: 1/3-6/17, 1/10/17, and 1/18/17. The western portion of the site has low cover of plants, due to CNLM working for years on the site. Heavy rains this year did generate a flush of seedlings estimated at 4,000 individuals. This was higher than in the last several drought years, indicating a persistent seedbank that will express itself even when Telar has been used (a pre-emergent). The eastern site has had consistent control for the past several years, but plant densities are still quite high (>31,000), even with the use of Telar (pre-emergent). Ward's weed is proving to be very difficult to control on this 10 acre site. This site is a good trial area, but the discovery of a larger site east of this site that is substantially larger (118 acres) complicates the long term goal of eradicating this species.



**Volutaria tubiliflora, Volutaria knapweed:**



**Table 8. Summary of treatments performed by AWM on Volutaria tubiliflora (Volutaria knapweed).**

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
Site #1: <i>Volutaria tubiliflora</i>	Volutaria knapweed	1	1.3	0.8	5,000

Plants were closely monitored so as to time treatment when basal rosettes were formed, but plants had not bolted. Other annuals were also small enough that bare ground was also still exposed. The infested area was treated with Milestone, a pre and post emergent herbicide that is selective for broadleaf plants, particularly composites (which Volutaria is, being a knapweed). Monocots (grasses) and not killed by Milestone, leaving annual plant cover, which is beneficial as the site is steep and potentially erodible. A crew of two treated the site with Milestone over three days: 1/27/17, 1/30-31/17. Follow-up visits demonstrated that the treatment was extremely effective, with few plants observed within treated areas (>99% reduction).



Volutaria plants at seedling/basal rosette stage.



Treatment of area with seedlings.





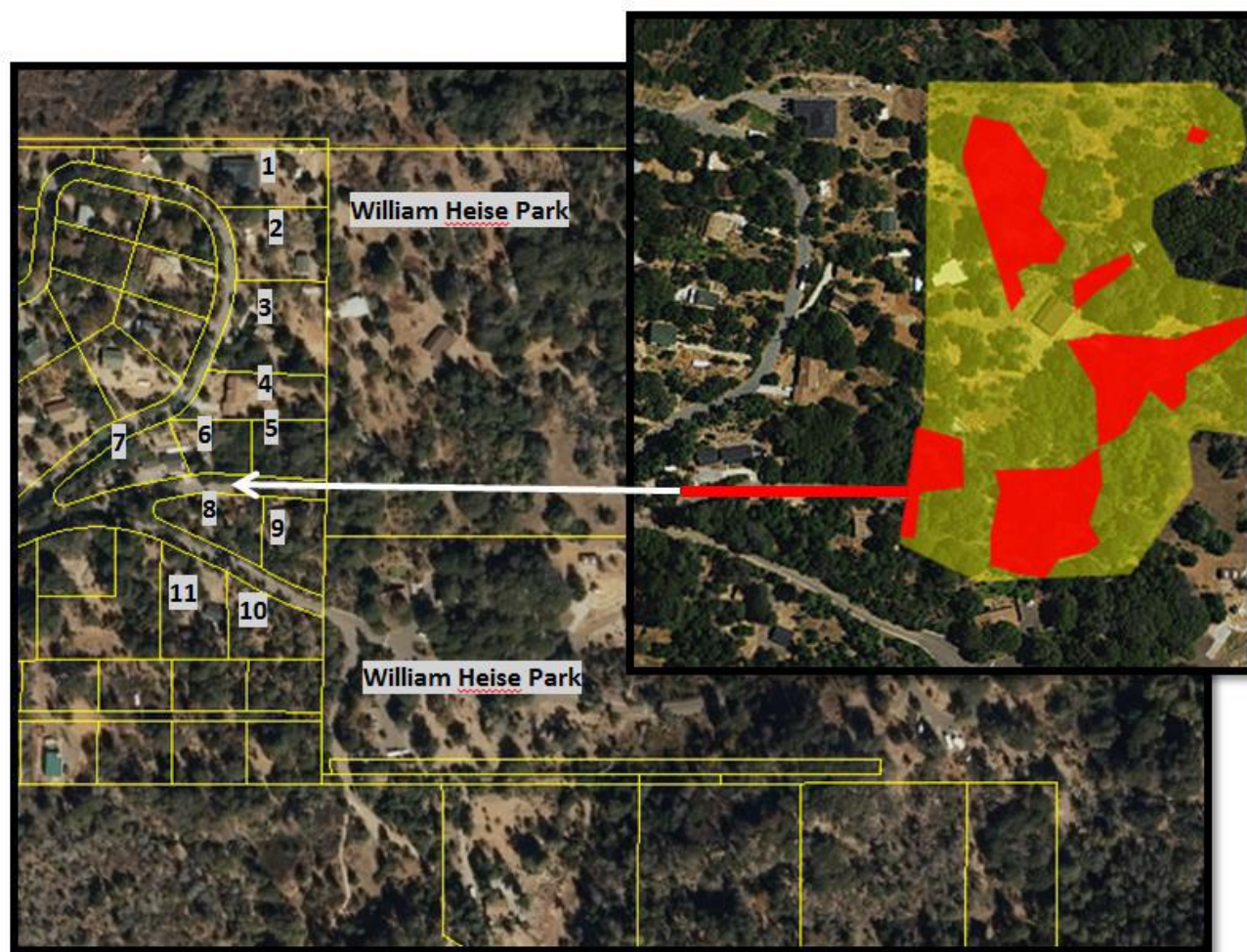
Site one month later. No *Volutaria* plants in treated area, but high grass cover remains.



Site one month later. No *Volutaria* plants in treated area, but high grass cover remains.



**Genista monspessulana, French broom:**



**Table 9. Summary of treatments performed by AWM on Volutaria tubiliflora (Volutaria knapweed).**

Site Name	Common Name	# of Visits	Acres Surveyed	Acres Treated	Plants treated
Site #5: <i>Genista monspessulana</i>	French broom	1	1.0	-	-

Site was surveyed and Right Of Entry (ROE) forms were left at properties adjacent to Heise park.

#### **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

- The San Diego County Weed Management Area (WMA) steering committee will meet on 3/8/17. UC Cooperative Extension staff (Chris McDonnell) will lead the meeting. The County of San Diego is supporting the WMA by providing meeting space and web site support. EDRR materials are available at the web site (sdwma.org). An EDRR AWM project update will be given at the meeting.
- *Volutaria* (*Volutaria tubuliflora*) has been located in San Diego County (Chula Vista, Rice Canyon). This plant occurs in Anza Borrego (Borrego Springs) and Orange County (Newport Bay). Coordination work with these regions on mapping, ID and treatment approaches continued (emails and calls).
- San Diego PAFs are being prepared for up to twelve EDRR species (see below), so that the Invasives Strategic Plan can be updated to include them. The literature review was completed and assessments were started (Table 10).
- Plant ID sheets were prepared for nine species (Table 11).

**Table 10: Species that are being reviewed for San Diego Plant Assessment Form (SDPAF).**

Scientific name	Common name	Notes	Existing Cal-IPC PAF
<i>Arctotheca calendula</i>	Capeweed	Uplands (shrub & grass), dunes	<b>Yes</b>
<i>Chrysanthemoides monilifera</i>	Bitou bush	Uplands (shrub & grass), dunes	<b>No</b>
<i>Enchylaena tomentosa</i>	Ruby saltbush	Uplands (shrub & grass)	<b>No</b>
<i>Euphorbia virgata</i>	Leafy spurge	Uplands, riparian	<b>Yes</b>
<i>Heliotropium supinum</i>	-	Vernal pools	<b>No</b>
<i>Limonium duriusculum</i>	European sea lavender	Wetlands (salt & fresh) & uplands	<b>No</b>
<i>Limonium ramosissimum</i>	Algerian sea lavender	Wetlands (salt & fresh) & uplands	<b>Yes</b>
<i>Myoporum acuminatum</i>	acuminatum	Uplands (shrub & grass), woodlands (Torrey pine)	<b>No</b>
<i>Senecio quadrdentatus</i>	Cotton burnweed	Grasslands	<b>No</b>
<i>Sesbania punicea</i>	<i>Rattlebox</i>	Wetlands (fresh)	<b>Yes</b>
<i>Stipa (Nassella) tenuissima</i>	<i>Mexican feather grass</i>	Uplands (shrub & grass)	<b>No</b>
<i>Volutaria tubuliflora</i>	<i>Volutaria</i>	Uplands (shrub & grass)	<b>No</b>

**Table 11. Primary EDRR targets for program with status of SDPAF and weed ID sheets noted.**

<b>Scientific name</b>	<b>Common name</b>	<b>Growth form</b>	<b>Habitat</b>	<b>SD ID Sheet</b>
<i>Aegilops triuncialis</i>	Barbed goat grass	Annual grass	Grassland	Draft
<i>Ageratina adenophora</i>	Eupatory	Perennial forb	Riparian	Yes
<i>Carrichtera annua</i>	Ward's weed	Annual forb	Uplands (shrub & grass)	Draft
<i>Centaurea solstitialis</i>	Yellow star thistle	Annual forb	Grassland	Draft
<i>Elymus caput-medusae</i>	Medusahead	Annual grass	Grassland	Draft
<i>Euphorbia terracina</i>	Carnation spurge	Annual forb	Uplands	Draft
<i>Euphorbia virgata</i>	Leafy spurge	Annual forb	Uplands	Draft
<i>Genista monspessulana</i>	French broom	Perennial shrub	Riparian or uplands	Yes
<i>Hypericum canariense</i>	Canary Island St. John's wort	Perennial shrub	Shrublands	Draft
<i>Limonium duriusculum</i>	European sea lavender	Perennial forb	Wetlands (salt & fresh) & uplands	Yes
<i>Limonium ramosissimum</i>	Algerian sea lavender	Perennial forb	Wetlands (salt & fresh) & uplands	Yes
<i>Lythrum salicaria</i>	Purple loosestrife	Perennial forb	Wetlands (fresh)	Yes
<i>Retama monosperma</i>	Bridal broom	Perennial shrub	Uplands (shrub & grass)	Draft
<i>Sesbania punicea</i>	Rattlebox	Perennial shrub	Wetlands (fresh)	Yes
<i>Volutaria tubuliflora</i>	Egyptian knapweed	Annual forb	Uplands (shrub & grass)	Draft

**Work Anticipated for 3rd Quarter Period, July 1, 2016 – September 31, 2016:**

**Task 1 – Invasive Plant Species Coordinator:**

- Update work plan if needed.
- Coordinate ROE work with AWM, update database.
- Monitor and coordinate with AWM during implementation.
- Survey and map sites as needed.



- Prepare quarterly and annual report.
- Submit GIS data for target EDRR species.

**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 points of targeted weeds, if found.

**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 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, San Diego Weed Management Area and County of Orange CNPS EDRR invasives group.
- Continue to aggregate data and track new prospective EDRR target species.
- Work on twelve San Diego PAFs for EDRR species will continue (Table 7), so that the Invasives Strategic Plan can be updated to include them.
- Work on nine EDRR identification sheets for priority species will continue (for land managers and regional biologists, Table 8).