



**2013**

# **Invasive Plant Inventory Inglewood Oil Field**

**Baldwin Hills CSD Provisions**

**E.7.b.**

**June 2014**

Prepared for:

**Freeport-McMoRan Oil & Gas**  
5640 South Fairfax Avenue  
Los Angeles, CA 90056

Prepared by:

**Cardno ENTRIX**  
12100 Wilshire Blvd., Suite 250  
Los Angeles, CA 90025  
&  
**ENVIRON**  
707 Wilshire Blvd., Suite 4950  
Los Angeles, CA 90017



## **TABLE OF CONTENTS**

<b>1.0</b>	<b>Introduction</b>	<b>1</b>
<b>2.0</b>	<b>Study Area</b>	<b>1</b>
<b>3.0</b>	<b>Methodology</b>	<b>2</b>
3.1	Literature Review	2
3.2	Field Surveys	2
<b>4.0</b>	<b>Survey Results</b>	<b>3</b>
4.1	Changes to the Target List	3
4.2	Impacts by Species	3
4.3	Impacts by Area	4
4.4	Problems Encountered During the Survey	4
<b>5.0</b>	<b>Conclusions and Recommendations</b>	<b>4</b>
5.1	General Conclusions	4
5.2	Recommended Target Species and Restoration Areas	4
<b>6.0</b>	<b>Literature Cited</b>	<b>5</b>

## 1.0 INTRODUCTION

Freeport-McMoRan Oil & Gas (the successor by merger to Plains Exploration & Production Company [FM O&G]) operates the Inglewood Oil Field in the Baldwin Hills of Los Angeles County (County).

This report presents the results of the 2013 Invasive Plant Inventory (2013 Inventory) conducted in all sensitive plant communities within the Inglewood Oil Field in August 2013. The purpose of the survey is to assess relative invasive species cover and to determine the level of non-native species encroachment on sensitive plant communities to assist in the selection of a mitigation site for any Habitat Restoration and Revegetation Plan. Baseline data from the *2009 Invasive Plant Inventory* (PXP 2010a) (2009 Inventory) was utilized as the comparative dataset.

Per guidelines in the July 2010 revision of the *Special Status Species and Habitat Protection Plan* (SSHPP) (PXP 2010b), sensitive vegetation communities within the CSD Boundary should be periodically monitored to determine if invasive plant species are encroaching or otherwise degrading sensitive plant communities. Periodic monitoring results should be compared with the 2009 baseline survey to determine invasive plant species trends. Results should also be used to identify potential sites for restoration. Monitoring shall be conducted by a qualified biologist. Contents of this 2013 Inventory include:

- Description of the Study Area
- Survey Methodology
- Survey Results
- Conclusions and Recommendations
- Literature Cited

## 2.0 STUDY AREA

The invasive plant survey was conducted in all sensitive natural communities within the Inglewood Oil Field. As defined in the SSHPP, sensitive communities contain a diversity of native plant species, the soils and natural topography are mostly intact, and the habitat area is of sufficient size that potential edge effects would be minor to moderate. Sensitive natural communities are defined as those communities that are not degraded, or are only somewhat degraded by non-native species; have specific state or federal protection; and/or that provide the highest potential for occupation by native plant and animal species, especially special status species, which are dependent on specific habitat types. Based on these criteria, the following vegetation communities present on the Inglewood Oil Field were considered sensitive for the purposes of this survey: Coastal Sagebrush Scrub (CS), Coyote Brush Scrub (CBS), Riparian Scrub (RS), Degraded Riparian Scrub (dRS), Willow (W), Oak Woodland (O), and Native Grassland (NG). Two “sensitive” plant communities, Disturbed Riparian Scrub and Willow were

excluded from evaluation based on the relatively degraded state of the community (dRS), and the limited extent of the mapping unit in single tree polygons (W).

## **3.0 METHODOLOGY**

### **3.1 Literature Review**

Prior to field surveys, Cardno ENTRIX biologists conducted a review of the relevant literature and databases in order to review and update the survey methods. The review included the following:

- North American Invasive Plant Mapping Standards (North American Invasive Weed Management Association 2002)
- California Invasive Plant Council, Invasive Plant Inventory (Cal-IPC 2013)
- Special Status Species and Habitat Protection Plan Inglewood Oil Field (PXP 2010b)
- Invasive Plant Inventory Inglewood Oil Field (PXP 2010a)

### **3.2 Field Surveys**

The 2013 Inventory was conducted by a team of two Cardno ENTRIX biologists, both experienced in habitat evaluation and vegetation inventory and sampling. One of the biologists was a botanist, proficient in invasive plant identification, and led the 2009 Inventory. As outlined in the SSHPP, the noxious weed inventory was conducted in all sensitive plant communities within the Inglewood Oil Field. Surveys were conducted from August 12-14, 2013.

Survey methods were similar to the 2009 Inventory, which were adapted from the North American Invasive Plant Mapping Standards (North American Invasive Weed Management Association 2002). Cardno ENTRIX biologists replicated the 2009 Inventory and visited each individual sensitive vegetation polygon and estimated percent cover for all visible invasive species. The same species that were evaluated in 2009 were re-surveyed, and any additional invasive species observed were also recorded. Two new sensitive plant community polygons were surveyed for invasive plant species in 2013. These were LO03 and VO04, both mapped as Native Grasslands.

Abundance estimates were made in absolute percent cover, which accounts for canopy overlap, and can result in total cover of over 100 percent. Plant cover was estimated as a percent of the ground covered by foliage of a particular weed species. Cover was recorded as a numeric value (NAIWMA 2002). If total cover of an individual species was determined to be less than one or two percent, that species was simply recorded as “present”.

## 4.0 SURVEY RESULTS

Figures 1 through 5 provide a visual depiction of each of the polygons surveyed. The results of both the 2009 and the 2013 Inventories are presented in Table 1. Data from the 2013 Inventory is depicted in red text, as are any additions to the target list.

The 2013 Inventory recorded 39 different exotic plant species. During both 2009 and 2013, the top 10 most dominant species included several Mediterranean annual grasses [*Avena fatua* (wild oat), *Bromus diandrus* (ripgut brome), and *Bromus madritensis* ssp. *rubens* (foxtail brome)]. Other dominant species included: *Cortaderia jubata* (purple pampas grass), *Foeniculum vulgare* (fennel), *Hirschfeldia incana* (summer mustard), *Nicotiana glauca* (tree tobacco), *Pennisetum setaceum* (crimson fountaingrass), *Ricinus communis* (castor bean), and *Salsola tragus* (Russian thistle). Due to the abundance and relative ubiquity of these species in California, annual grasses are not discussed further.

### 4.1 Changes to the Target List

Four species were added to the target list, including: *Arundo donax* (giant reed), *Eucalyptus* sp., *Kochia scoparia* (Mexican fireweed), and *Solanum lanceolatum* (lance leaf nightshade). These species should continue to be tracked during future monitoring visits.

Five species were removed from the target list due to a lack of a noxious/invasive rating by Cal-IPC or California Department of Food and Agriculture (CDFA) (Cal-IPC 2013, CDFA 2013). Species removed from the target list included: *Chamaesyce* sp., *Erodium botrys* (broad leaf filaree), *Malva parviflora* (cheeseweed), *Melilotus indicus* (*alba*) (annual yellow sweetclover), and *Sonchus asper* (sow thistle). These changes are indicated by a greyed-out data in the results table.

Several name changes were also incorporated into the target list. New nomenclature follows the 2012 Second Edition of the Jepson Manual (Baldwin et al. 2012) and is indicated in red font. Old names are shown by (=old name).

### 4.2 Impacts by Species

Fifteen (15) species from the target list showed an increase in cover from 2009 to 2013. The following species showed an increase in cover since 2009, and/or were observed in additional polygons (numbers in parentheses indicate polygons with new populations or increased populations): *Acacia melanoxylon* (blackwood acacia) (8), *Carpobrotus edulis* (iceplant) (6), *Chrysanthemum coronarium* (crown daisy) (5), *Cortaderia jubata* (5), *Foeniculum vulgare* (10), *Hirschfeldia incana* (17), *Myoporum laetum* (lollypop tree) (6), *Nicotiana glauca* (9), *Pennisetum setaceum* (9), *Ricinus communis* (6), *Salsola tragus* (10), *Schinus molle* (Peruvian peppertree) (6), *Silybum marianum* (milk thistle) (5), *Stipa milacea* (= *Piptatherum millaceum*) (smilgrass) (10), and *Washingtonia robusta* (Washington fan palm) (9).

### 4.3 Impacts by Area

Thirteen polygons showed an increase in invasive weed cover by 10 percent or greater, including: BC04, BC06, BC09, BC10, BC11, LO04, LO05, LX02, LX05, SF02, SF03, VO01, and VO02.

### 4.4 Problems Encountered During the Survey

Several factors affected the final survey results: 1) the survey was conducted later in the season and therefore was not conducive to plant identification; and 2) these results showed an increased variability when compared to the 2009 data, due to variation in the survey season.

The 2009 surveys were conducted in the spring (April) during which time, annual grasses, and small flowering forbs were readily visible. In 2013, several of these species were not readily visible. These species include: annual grasses (*Avena*, *Bromus*, *Hordeum*, *Festuca* [=*Vulpia*]), *Chrysanthemum coronarium*, *Chamaesyce* sp., *Euphorbia virgata* (= *esula*) (leafy spurge), *Oxalis* sp, *Raphanus sativa*, *Silybum marianum*, and *Sonchus asper*). In addition, late-developing species that were not visible (or less developed) in the spring surveys of 2009 were at their peak, and highly visible in August. These included: *Hirschfeldia incana*, *Kochia scoparia* and *Salsola tragus*.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 General Conclusions

An increase in invasive species cover was detected in the majority of the sensitive vegetation polygons; however, these results are somewhat confounded by 1) changes to the target list, and 2) variations in survey season. However, significant increases (>10 percent) were observed in 13 polygons (see above Impacts by Area). In addition, 15 species showed an increase in cover across the oil field (see above Impacts by Species).

### 5.2 Recommended Target Species and Restoration Areas

In lieu of treating specific areas for all invasive species, eradication can be more effective when species-specific methods are used. Selected target species for eradication should include species with a “high” Cal-IPC rating, and /or species that are locally aggressive and increasing on site. Focusing eradication efforts on Mediterranean grasses is not recommended due to their general ubiquity in California. Likewise, species with a “high” rating that are uncommon in the field have been excluded. Target species for eradication would include: *Carpobrotus edulis* (high), *Cortaderia jubata* (high), and *Foeniculum vulgare* (high). Polygons that have greater than 10 percent cover of these species include:

- LO01 and LO02 (*Foeniculum vulgare*)
- BC03, BC09, BC11, LO05, SR04, SF02 (*Cortaderia jubata*)
- VO01 (*Carpobrotus edulis*)

## **6.0 LITERATURE CITED**

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken, editors. 2012. *The Jepson Manual: Vascular Plants of California*, Second Edition. University of California Press, Berkeley.

California Department of Food and Agriculture (CDFA). 2013. *Encyclowedia: Weed Ratings*. Available online at: [http://www.cdfa.ca.gov/plant/ipc/encycloweedia/winfo\\_weedratings.htm](http://www.cdfa.ca.gov/plant/ipc/encycloweedia/winfo_weedratings.htm). Accessed September 2013.

California Invasive Plant Council (Cal-IPC). 2013. *California Invasive Plant Inventory Database*. Available online at: <http://www.cal-ipc.org/paf/>. Accessed September 2013.

MRS. 2008. *Final Environmental Impact Report Baldwin Hills Community Standards District*. Prepared for: Los Angeles County Department of Regional Planning. October.

North American Invasive Weed Management Association. 2002. *North American Invasive Plant Mapping Standards*. Approved by North American Invasive Weed Management Association. Endorsed by the Federal Interagency Committee for the Management of Noxious and Exotic Weeds, May 17, 2002.

Plains Exploration and Production Company (PXP). 2010a. *Invasive Plant Inventory Inglewood Oil Field*. Baldwin Hills Community Standards District Provisions E.7.b. and L.6.a. July 2010.

Plains Exploration and Production Company (PXP). 2010b. *Special Status Species and Habitat Protection Plan Inglewood Oil Field*. Baldwin Hills Community Standards District Provisions E.7.b. and L.6.a. Revised July 2010.







LEGEND

- Active Surface Oil Field Boundary

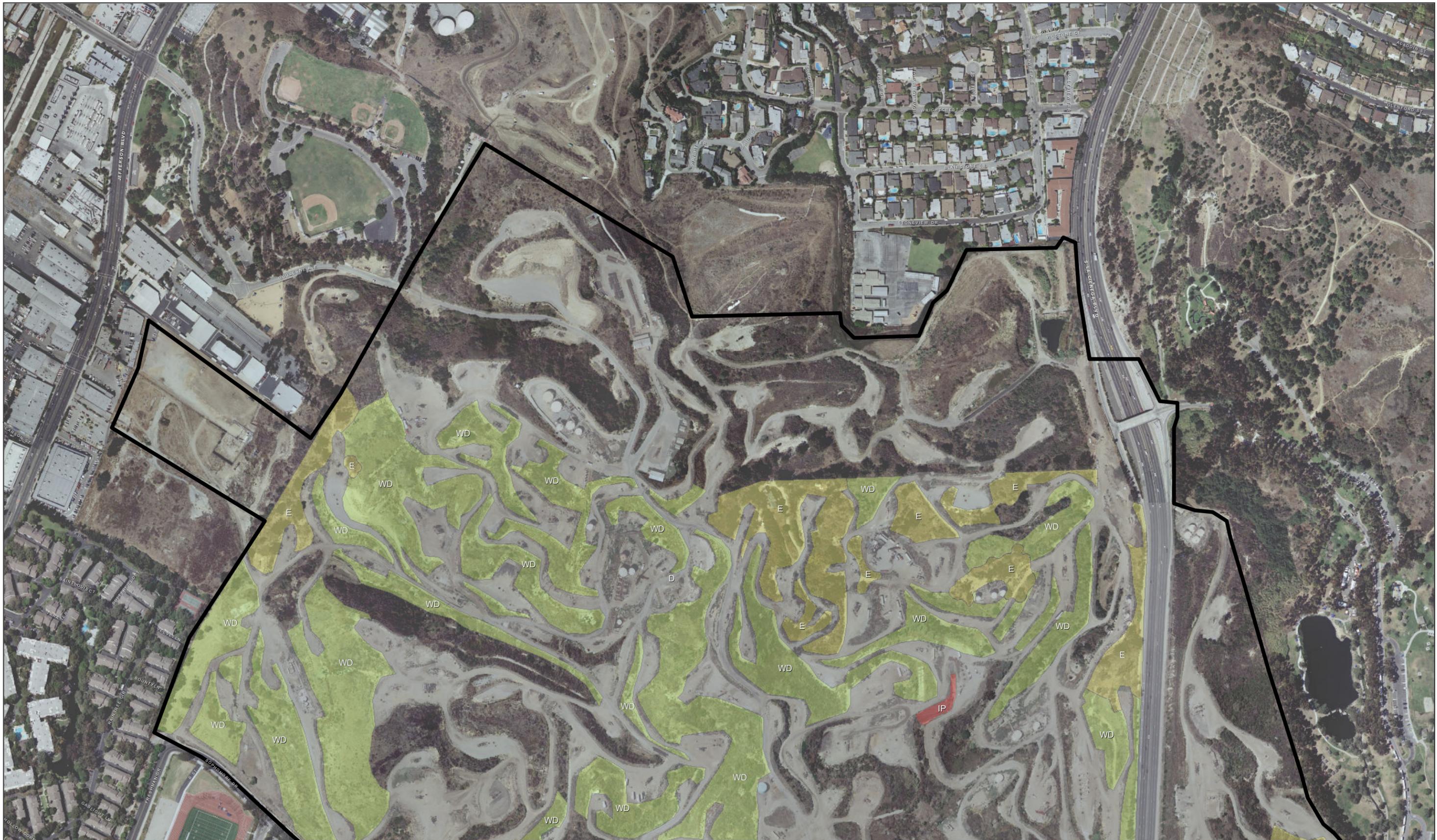


1 Inch = 1,167 feet

Last Revised: 06 | 09 | 14



2013 Invasive Plant Survey  
**FIGURE 1 | INVASIVE SPECIES COVER**  
 INDEX MAP



Map 1  
 Map 2  
 Map 3  
 Map 4

**INVASIVE PLANT COMMUNITIES**

- Eucalyptus Naturalized Forest (E)
- Pine Trees (PT)
- Weed Dominated (WD)
- Ice Plant (IP)

**BOUNDARY LAYER**

- Active Surface Oil Field Boundary

**Cardno ENTRIX**

0 210 420 840  
 Scale in Feet  
 1 inch = 400 feet  
 Last Revised: 06 | 09 | 14



**2013 Invasive Plant Survey**  
**FIGURE 2 | INVASIVE SPECIES COVER**  
 MAP 1 OF 4



Map 1  
 Map 2  
 Map 3  
 Map 4

**INVASIVE PLANT COMMUNITIES**

- Eucalyptus Naturalized Forest (E)
- Pine Trees (PT)
- Ice Plant (IP)
- Weed Dominated (WD)

**BOUNDARY LAYER**

- Active Surface Oil Field Boundary

**Cardno ENTRIX**

0 210 420 840  
 Scale in Feet  
 1 inch = 400 feet  
 Last Revised: 06 | 09 | 14



**2013 Invasive Plant Survey**  
**FIGURE 3 | INVASIVE SPECIES COVER**  
 MAP 2 OF 4



Map 1  
Map 2  
Map 3  
Map 4

- INVASIVE PLANT COMMUNITIES**
- Eucalyptus Naturalized Forest (E)
  - Pine Trees (PT)
  - Weed Dominated (WD)
  - Ice Plant (IP)

- BOUNDARY LAYER**
- Active Surface Oil Field Boundary

**Cardno ENTRIX**

0 210 420 840

Scale in Feet

1 inch = 400 feet

Last Revised: 06 | 09 | 14



2013 Invasive Plant Survey  
**FIGURE 4 | INVASIVE SPECIES COVER**  
MAP 3 OF 4



Map 1	MAP TILES
Map 2	Map 3
Map 4	

**INVASIVE PLANT COMMUNITIES**

<span style="display: inline-block; width: 15px; height: 10px; background-color: #ffff00; border: 1px solid black;"></span> Eucalyptus Naturalized Forest (E)	<span style="display: inline-block; width: 15px; height: 10px; background-color: #90ee90; border: 1px solid black;"></span> Pine Trees (PT)
<span style="display: inline-block; width: 15px; height: 10px; background-color: #ff0000; border: 1px solid black;"></span> Ice Plant (IP)	<span style="display: inline-block; width: 15px; height: 10px; background-color: #90ee90; border: 1px solid black;"></span> Weed Dominated (WD)

**BOUNDARY LAYER**

<span style="display: inline-block; width: 15px; height: 15px; border: 2px solid black;"></span> Active Surface Oil Field Boundary
--



2013 Invasive Plant Survey  
**FIGURE 5 | INVASIVE SPECIES COVER**