Fiesta Island Rare Plant Surveys by California Native Plant Society Rare Plant Survey Committee, Spring 2011

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Summary

In April and May, 2011, California Native Plant Society (CNPS) volunteers, led by Dr. Frank Landis, searched for sensitive, rare, and endangered plants on the publicly accessible areas of Fiesta Island. This search was part of a larger 2011 effort to find rare coastal dune plants in San Diego County, focusing on beaches that had not been recently surveyed.

CNPS volunteers found five sensitive plant species growing on Fiesta Island:

- Nuttall's lotus, a CDFG list 1B species. Between 1,234 and 1,253 plants were found.
- Coast woollyheads, a CDFG list 1B species. Between an estimated 4,350 and 5,050 were found.
- Robinson's pepper-grass, a CDFG list 1B species. Approximately 10,000 were found.
- Red sand verbena, a CDFG list 4 species. Sixteen were found.
- Woolly seablite, a CDFG list 4 species. This shrub is abundant on berms around the southern half of the island, and was not counted.

Scientific names for all species are given at the end of the document.

Volunteers mapped the occurrences of the first four species. Woolly seablite is common on Fiesta Island, growing on berms on the southern half of the island, and so the volunteers focused their efforts on the more uncommon and sensitive species. All data collected (including a kmz file for Google Maps) are available from Frank Landis

The three List 1B species pose management issues. As discussed below, the biggest threat these species face are weeds, especially crown daisy and ice plant. They require active protection, in the form of weed control. However, some control measures may destroy the rare plants. For example, using front loaders and other equipment to remove the ice plant can cause loss of these plants, as they are invisible from the cabs of such large machines. Fortunately, State Parks has successfully removed weeds from around these plants, at Silver Strand State Beach, and they have indicated a willingness to share their strategies and expertise.

Fiesta Island is scheduled to be re-landscaped over the coming years. The rare plants appear to all occur in areas slated either for habitat preserves or native plantings. The presence of List 1B species requires some alteration in these plans, as planting on top of existing sensitive plant populations requires mitigation. We suggest that all of these populations be designated as habitat preserves, and that their need for active weed control be factored in to the re-landscaping design.

INTRODUCTION

The Rare Plant Committee of the San Diego chapter of the California Native Plant Society performs annual surveys of rare, sensitive, or endangered plants, as its name suggests. Its mission is to find species and populations that are "falling through the cracks," plants that have not been recently surveyed or that occur in areas where systematic sampling or specimen collection is difficult. In these surveys, we fill a valuable role, checking on rare plants that are not typically monitored.

All work is performed by volunteers, led and supervised by Dr. Frank Landis, a trained botanist and plant ecologist. The survey protocol is basic: volunteers are recruited and trained to identify the plants under field conditions, and populations are either counted or numbers estimated, depending on what is found. The data are recorded on forms from the California Natural Diversity Database (CNDDB) of the Department of Fish and Game (DFG). Data are shared with the landowner, state CNPS, CNDDB, CDFG, and other interested parties on request.

In 2011, the Rare Plant Committee chose to survey dune plants, because there was a consensus among informed participants that we had insufficient information on a number of species. In contacting landowners and studying existing records, the committee narrowed down potential survey locations to Silver Strand State Beach, Silver Strand Elementary School Beach, Fiesta Island, Black's Beach, Torrey Pines, San Elijo Lagoon, and Batiquitos Lagoon.

This document discusses survey methods, the results of the surveys by species, and the implications for management and redevelopment of Fiesta Island. Common names are used throughout the document, and species' scientific names and status (sensitive, native and/or non-native) are given in a table on the last page.

Methods

Ten volunteers surveyed Fiesta Island for 62 person-hours, spread over four days (April 1, 8, 15, and May 20) in spring 2011. The volunteers were led by Frank Landis (all four days) and Fred Roberts (on two days), both experienced botanists.

Counting methods varied. On the April 1, the groups counted individual groups of plants and recorded single GPS points, resulting in the spread of points seen. On April 8, surveyors outlined polygons, and either directly counted or estimated numbers of plants within each area. On April 15, the Nuttall's lotus was surveyed around an area where ice plant had been removed by a front loader. Although there was no evidence that the front loader had taken any Nuttall's lotus, the plants in that area were counted on separate points, rather than as an outlined polygon. Coast woollyheads, conversely, was mapped as a polygon on that day. Finally, on May 20, additional plants were encountered during efforts to flag existing populations. These populations were small, and recorded as single points. There is no optimal way to count these species.

The most important point is that the sensitive species are all annuals, so they will not occur in precisely the same places next year. A survey is required to determine their location and numbers any spring.

Nuttall's Lotus

Nuttall's lotus is one of four (perhaps five) lotus species growing on Fiesta Island. It is a sprawling annual that blooms in spring, in April and May in 2011. All of the lotus species co-occur on the south-east lobe of Fiesta Island, and some training is required to tell the species apart in the field.

Surveys found between 1234 and 1253 plants, growing in nine separate patches (Table 1). Patches were grouped into two populations (Figure 1). The smaller population of two patches was located in the center of the island (Figure 2). The larger population of seven patches occurred in the south-east lobe (Figure 3).

Nuttall's lotus typically grew in open areas, with a low cover of native plants and some ephemeral weeds such as storksbill (Table 1). Where it grew next to ice-plant, it was rooted in an open area and spread onto the ice-plant. It was absent from areas overgrown by iceplant, crown daisy, and ripgut, strongly suggesting that these invasive weeds crowd it out. It was found growing with Robinson's pepper-grass in one patch, and with coast woollyheads in three patches.

Table 1. Nuttall's lotus survey results.

Survey Date	Map ID(s)	Number found	Habitat Description
4/1/2011	LN 0401A	18-20	These plants grow in one patch about 10 meters in diameter. The semi disturbed area is open, with <25% vegetative cover. Soil is sandy with a few shells. Area is flat, higher than surrounding dunes. Surrounding plants include beach evening primrose, a few crown daisy, red-stem filaree, and ripgut brome. 10% of the Lotus were blooming, 90% not blooming at time of survey.
4/1/2011	LN 0401D, LN 0401E, LN 0401F, LN 0401G, LN 0401H, LN 0401I, LN 0401J	83-88	These scattered plants belong to a scattered group, which were mapped separately rather than as a polygon. Surrounding plants include woolly lotus, crown daisy, storksbill, telegraph weed, coastal golden bush, cat's ear, and California filago. Approximately 50% of the lotus were blooming, 50% not blooming at time of survey.
4/8/2011	LN 0408B	610	Large irregular patch in openings between shrubs around trail. Plants are low, cover is high. Nuttall's lotus dominant in some areas, with storksbill, beach evening primrose, and two patches of coast woollyheads. 75% of lotus were blooming, 25% not blooming at time of survey.
4/8/2011	LN 0408E	140-150	Low plants on sand, vegetative cover ~75%. Dominant plants include storksbill and Nuttall's lotus. Also present: hairy lotus, telegraph weed, California filago. Weeds grow around edges, including crown daisy, spanish brome, rattail fescue. 40% of lotus blooming, 60% not blooming at time of survey.
4/8/2011	LN 0408F	300	Low plants on silty sand, vegetative cover ~75%. Other species include hairy lotus, cat's ear, crown daisy, storksbill, white everlasting, spanish brome, ice plant, and beach evening primrose. 60% of lotus *were* blooming, 40% not at time of survey.
4/8/2011	LN 0408G	30	Silty clay with sand. Other plants include beach evening primrose, sand mat, Robinson's pepper-grass, ice plant, and broom baccharis. 70% of lotus were blooming, 30% not blooming at time of survey.
4/8/2011	LN 0408H	18	Silty sandy ground. Other plants include beach evening primrose, deerweed, woolly lotus, sea-lavendar, and storksbill. 70% of lotus were blooming, 30% not blooming at time of survey.
4/15/2011	LN 0415A,LN 0415B, LN 0415C, LN 0415D, LN 0415F	17	Plants in small patches, from 1-3 feet in diameter, around ice plant. Most are at edge of area cleared morning of 4/15/11. Surrounding plants are carpets of ice plant. Some plants under beach evening primrose and deerweed. Other nearby plants incude storksbill, telegraph weed, and sand mat. All lotus flowering when surveyed.
5/20/2011	LN 0520A	18-20	Habitat is an irregular patch of open sand and shells 3-5 m across, with 60% vegetative cover dominated by Nuttall's lotus, plus telegraph weed and storksbill. Coast woollyheads in same area, but not within patch. All lotus setting fruit when surveyed.

Figure 1. 2011 Nuttall's lotus populations found on Fiesta Island

Figure 2. 2011 Nuttall's lotus populations at the center of Fiesta Island

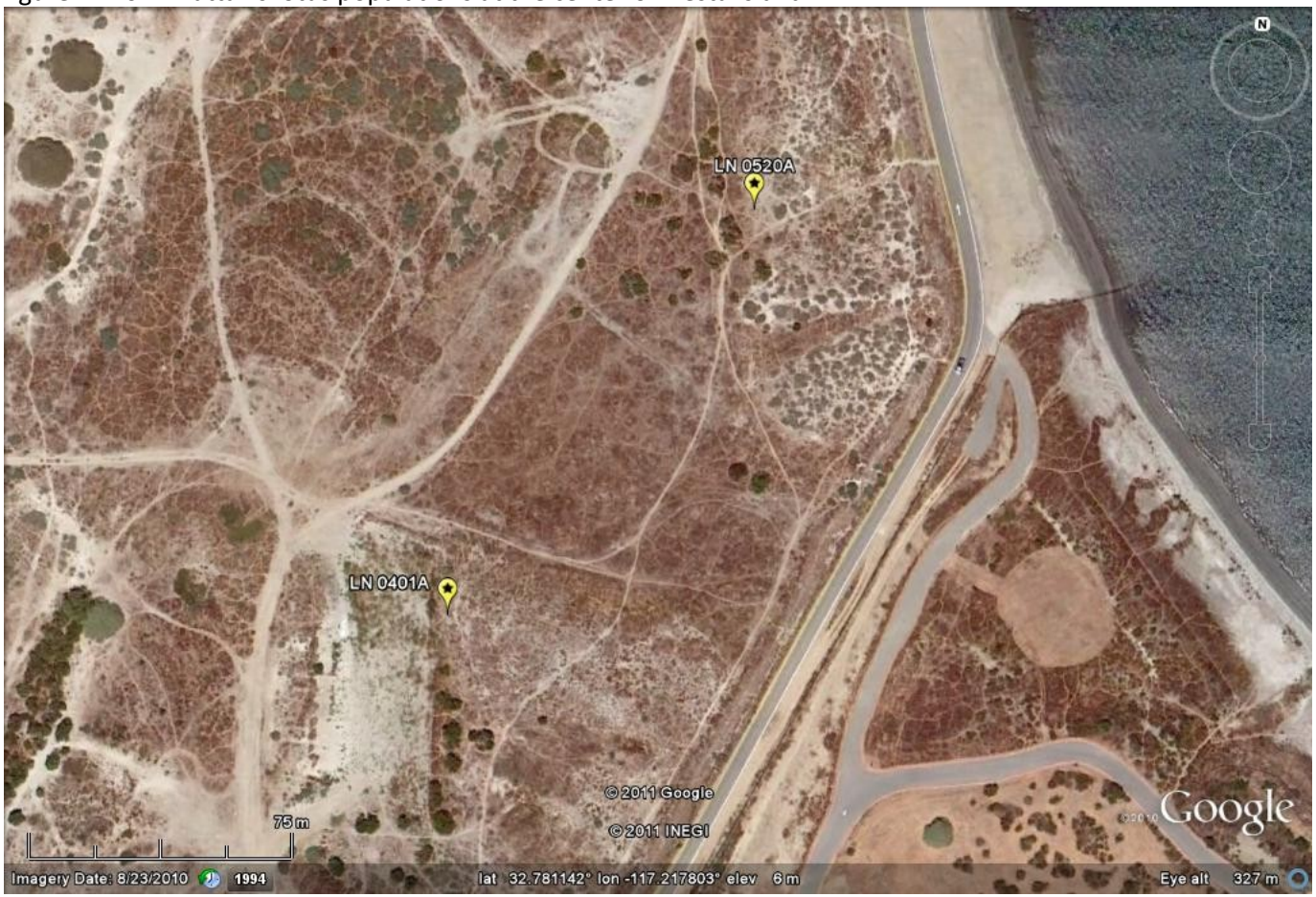
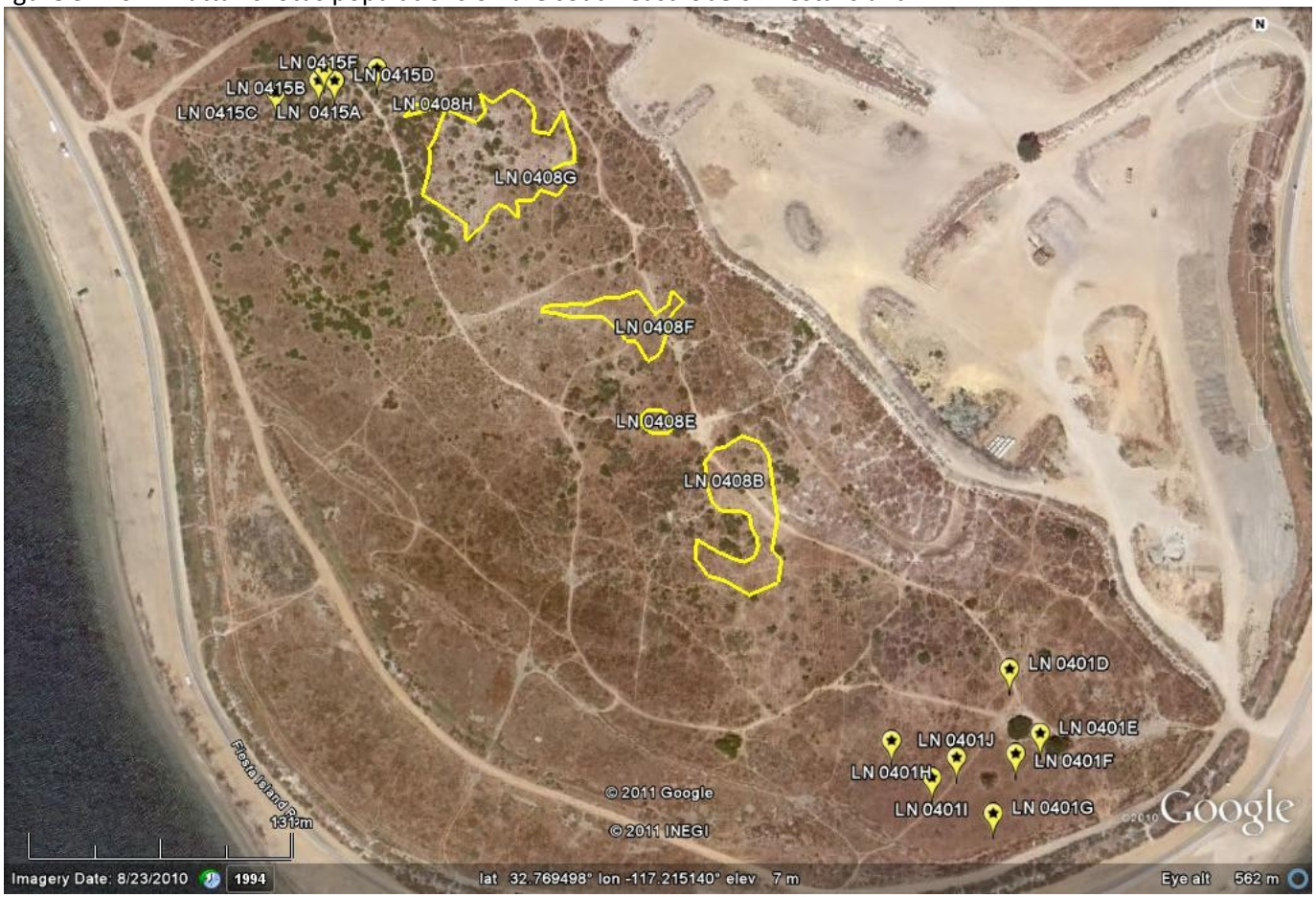


Figure 3. 2011 Nuttall's lotus populations on the south-east lobe of Fiesta Island



Coast Woollyheads

Coast woollyheads is a small annual, often only a few inches across at maturity. While it is rare, it can be very common where it grows, to the point of being too numerous to count accurately.

Surveys found between 4,350 and 5,050 plants, growing in seven separate patches (Table 2). Patches were grouped into two populations (Figure 4). As with Nuttall's lotus and Robinson's pepper-grass, the smaller population of four patches was located in the center of the island (Figure 5). The larger population of three patches occurred in the south-east lobe (Figure 6).

Coast woollyheads typically grew in open, sandy areas, often near trails with a low cover of native plants and some ephemeral weeds such as storksbill or red-stem filaree(Table 2). It was absent from areas overgrown by ice plant, crown daisy, and ripgut brome, suggesting that these invasive weeds outcompete it. It was found growing with or near Nuttall's lotus in three patches.

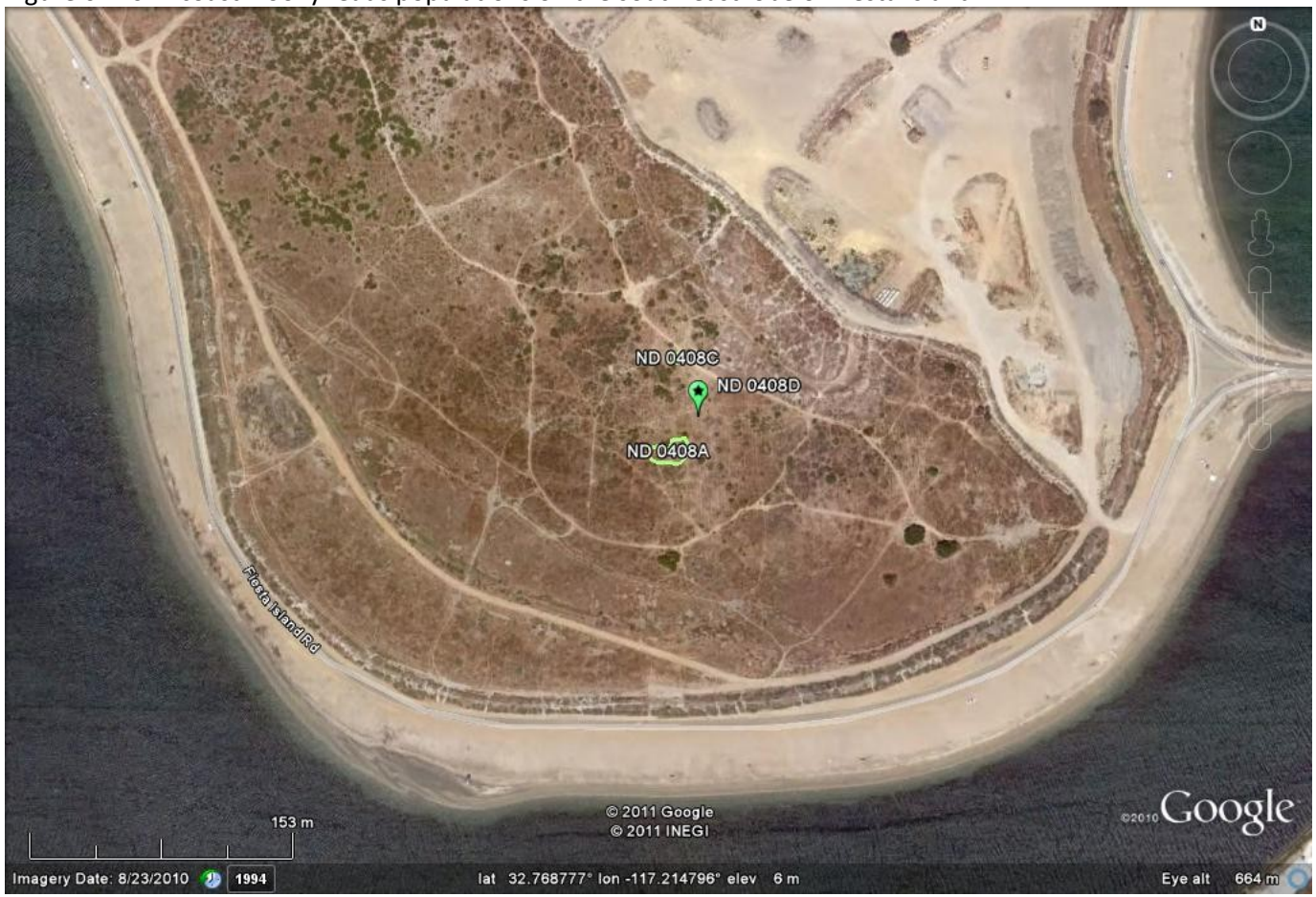
Table 2. Coast Woollyheads survey results

Date of Survey	Map ID	Number Found	Habitat Description
4/1/2011	ND 0401B	80-120	Plants scattered within 50 m circle around point. The habitat is open (<50% vegetative cover), on sandy soil with few shells. Other major plants are beach evening primrose, ragweed, red-stem filaree. Weeds, especially crown daisy and ripgut brome, encroach on edges of population. No woollyheads were flowering or fruiting at time of survey.
4/1/2011	ND 0401C	20-30	Plants in a 6 m circle around point. The habitat is open (<50% vegetative cover), on sandy soil with few shells. Other major plants include beach evening primrose, ragweed, and red-stem filaree. Weeds, especially crown daisy and ripgut brome, encroach on edges of population. No woollyheads were flowering or fruiting at time of survey.
4/8/2011	ND 0408A	~3,000	Populations is boomerang-shaped polygon with arms about 8 m across. The habitat is an open area on sand, with about 75% vegetative cover of mostly low growing plants including coast woollyheads, storksbill and hairy lotus. Other plants include telegraph weed, a few small crown daisy. No woollyheads were flowering or fruiting at time of survey.
4/8/2011	ND 0408C	150-200	Population is about 3 m x 6 m, growing in a patch of low, dense Nuttall's lotus, with storksbill, scattered telegraph weed, some beach evening primrose, California filago, and sand mat. Crown daisy in surrounding area. No woollyheads were flowering or fruiting at time of survey.
4/8/2011	ND 0408D	~400	Population is in a roughly 3 x 2 m patch, open, with about 50% vegetative cover of low plants. The dominant plants are Nuttall's lotus, beach evening primrose, and cat's ear. There is a patch of crown daisy on north side. No woollyheads were flowering or fruiting at time of survey.
4/15/2011	ND 0415G	200-300	The population grows on sandy soil, in open, with <25% vegetative cover. Other plants include Beach sand verbena, beach evening primrose, crown daisy, storksbill, and beach bur-sage. Crown daisy is a threat. No woollyheads were flowering or fruiting at time of survey.
4/15/2011	ND 0415I	500-1000	The populations grows on a sand flat, in open, between beach bur-sage and beach evening primrose. The weeds ripgut brome and crown daisy are also present. No woollyheads were flowering or fruiting at time of survey.

Figure 4. 2011 coast woollyheads populations found on Fiesta Island

Figure 5. 2011 coast woollyheads populations at the center of Fiesta Island

Figure 6. 2011 coast woollyheads populations on the south-east lobe of Fiesta Island



Robinson's pepper-grass

Robinson's pepper-grass is a small annual, often only a few inches tall at maturity. While it is rare, it can be very common where it grows, to the point of being too numerous to count accurately. Moreover, there are other, non-native pepper-grasses growing on Fiesta Island, and it requires an expert to properly identify this plant.

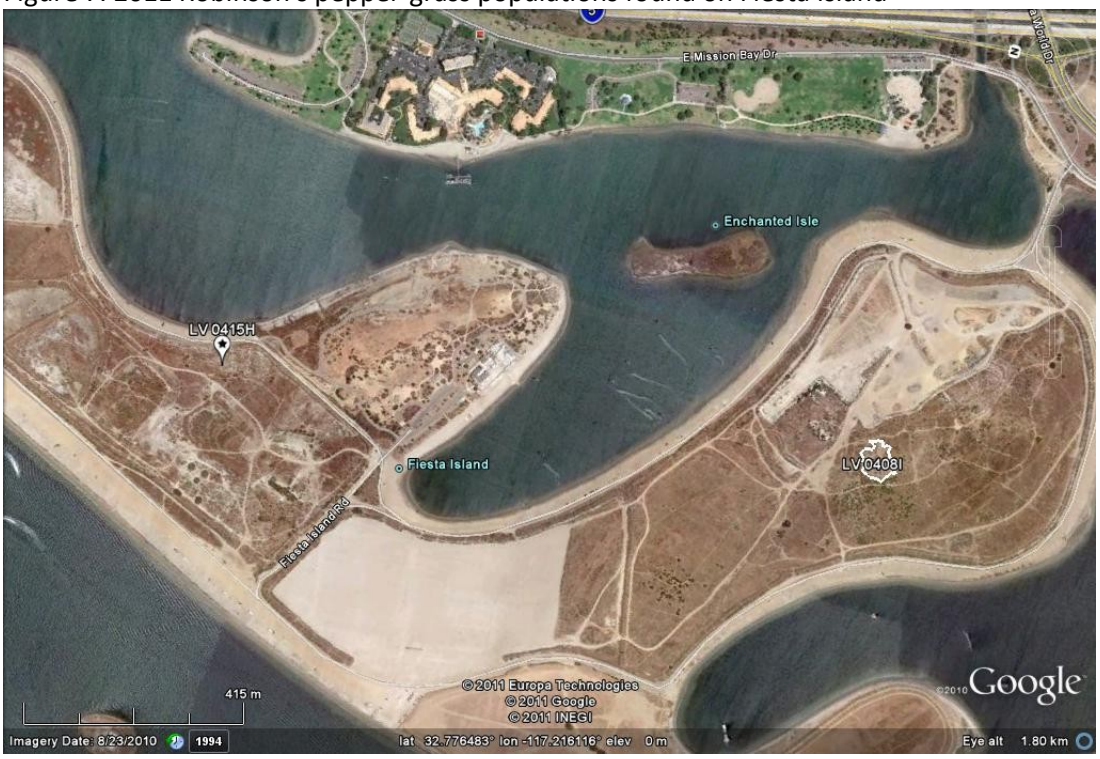
Surveys found between approximately 10,000 plants, growing in two separate patches (Table 3). Almost all were growing with Nuttall's lotus in a patch on the south-east lobe, while five plants were growing with coast woollyheads in the center of the island (Figure 7).

Robinson's peppergrass typically grew in open, sandy areas, often near trails with a low cover of native plants and some ephemeral weeds such red-stem filaree(Table 3). It was absent from areas overgrown by ice plant, crown daisy, and ripgut brome, suggesting that these invasive weeds crowd it out. It was found growing with Nuttall's lotus in its biggest patch.

Table 3. Robinson's pepper-grass survey results

Date of Survey	Map ID	Number	Habitat Description
4/8/2011	LV 0408I	~10,000	Plants growing on silty clay with sand. There are too many pepper-grass (all setting seed) to count). The polygon is dominated by Nuttall's lotus. Other plants include beach evening primrose, sand mat, ice plant, and broom baccharis. The population is threatened by weeds such as crown daisy.
4/15/2011	LV 0415H	5	Small patch of plants growing on sandy soil, in open, with <25% vegetative cover. Other plants include beach bur-sage, beach evening primrose, telegraph weed, hairgrass, and red-stem filaree. Population is threatened by crown daisy and red-stem filaree.

Figure 7. 2011 Robinson's pepper-grass populations found on Fiesta Island



Red sand verbena and Woolly seablite

Red sand verbena is a sprawling perennial and woolly seablight is a shrub. Both species are on the List 4 watch list, which means that they are uncommon, but not known to be threatened, rare, or endangered.

Red sand verbena was seen once, in a population of 16 plants growing on the top of a berm in the center of the island. It may grow elsewhere. It was found while walking in to flag the sensitive plant populations in the area.

Woolly sea-blite grows on many of the berms around the island, particularly around the south-east lobe. It also grows occasionally on the flat areas of the southeast lobe. The rare plant survey committee decided not to count it in spring 2011, to devote time to finding the much rarer, annual species. If necessary, we can survey this species in the summer or fall, since it is perennial and relatively easy to identify.

Figure 8. 2011 red sand verbena location

Management and Redevelopment Implications

While Fiesta Island's managers should strive to preserve all native plants on the island, the three List 1B species require additional protection. Although their ecology is not well understood, all available evidence suggests that Nuttall's lotus, Coastal woollyheads, and Robinson's pepper-grass require relatively bare sand in order to germinate and grow. They also appear to do best around other native plants.

For bare sand to be available for these rare plants, any management plan should have as a goal the relative absence of weeds such as crown daisy, iceplant, and ripgut grass. Nuttall's lotus can sprawl on top of ice plant, but it still requires an adjacent bare area in which to root. The other species also appear to require bare areas, and perhaps loose sand.

Bare sand may also be favored by light disturbance, such as dog walkers on small trails. This is a question of active interest to State Parks. Currently, healthy populations of Nuttall's lotus and coast woollyheads occur around a picnic area at Silver Strand State Beach, and the obvious hypothesis is that summer use of the picnic area keeps the sand loose enough for the lotus and woollyheads to flourish there. However, this hypothesis needs to be experimentally tested.

The sensitive species do well around other native dune plants, such as beach evening primrose and beach bur-sage. During surveys, these more visible native plants were used as markers for areas that might support sensitive plants.

These characteristics lead to six management and restoration suggestions:

1. All three species are annuals, coming up from seed every winter and dying by July. They need time to set seed in May and June, and management activities around them should be avoided during this period, so that the populations are not inadvertently wiped out.
2. Weed control is necessary to protect these species. State Parks has experienced success at Silver Strand in controlling weeds, and they have expressed their willingness in sharing their expertise with Fiesta Island's managers.
3. Since the sensitive plants are typically small, using large machinery to remove weeds around them is problematic. The issue is that they are difficult to spot from more than a few yards away, and the operators of heavy equipment may simply not see them.
4. Because the sensitive species require bare sand, fenced exclosures may be inappropriate for these species. While this needs to be confirmed experimentally, evidence to date suggests they benefit from mild disturbance, something they will not get inside fences. They appear compatible with walking trails, but not with off-road vehicle use.
5. Because their ecology is poorly known, moving populations is inappropriate at this time. While the plants may have been brought to the island in sand from other sites, we do not know enough about them to guarantee that seed planting or wholesale sand movement will benefit the species.

6. We suggest that areas containing these species be designated as habitat preserves, that planting of native plants be restricted or excluded around their populations, and that the primary management activity to support them should be appropriate weed control.

Species

Table 4. Species found during rare plant survey

Common Name	Scientific Name	Status
beach bur-sage	*Ambrosia chamissonis*	Native
beach evening primrose	*Camissonia cheiranthifolia, =Camissoniopsis cheiranthifolia* in the next *Jepson Manual* revision	Native
beach sand verbena	*Abronia umbellata*	Native
broom baccharis	*Baccharis sarothroides, =Lepidospartum squamatum* in the next *Jepson Manual* revision	Native
California filago	*Filago californica, =Logfia californica* in the next *Jepson Manual* revision	Native
cat's ear	*Hypochaeris glabra*	Non-native
coast goldenbush	*Isocoma menziesii*	Native
coast woollyheads	*Nemacaulis denudata* var. *denudata*	List 1B
crown daisy	*Chrysanthemum coronarium, =Glebionis coronaria* in the next *Jepson Manual* revision.	Non-native, invasive weed
deerweed	*Lotus scoparius, =Acmispon glaber* in the next *Jepson Manual* revision	Native
hairgrass	*Aira* sp.	Non-Native
hairy lotus	*Lotus strigosus, =Acmispon strigosus* in the next *Jepson Manual* revision	Native
ice plant	*Carpobrotus edulis.*	Non-native, invasive weed
Nuttall's lotus	*Lotus nuttallianus, =Acmispon prostratus* in the next *Jepson Manual* revision	Native, List 1B
ragweed	*Ambrosia psilostachya*	Native
rattail fescue	*Vulpia myuros*	Non-native
red sand verbena	*Abronia maritima*	List 4, Native
red-stem filaree	*Erodium cicutarium*	Non-native, invasive weed
ripgut brome	*Bromus diandrus*	Non-native, invasive weed
Robinson's pepper-grass	*Lepidium virginicum* var. *robinsonii, = Lepidium virginicum* var. *menziesii* in the next *Jepson Manual revision*	Native, List 1B
sand mat	*Cardionema ramosissimum*	Native
sea-lavendar	*Limonium perezii*	Non-native
spanish brome	*Bromus madritensis*	Non-native
storksbill	*Erodium botrys*	Non-native, invasive weed
telegraph weed	*Heterotheca grandiflora*	Native
white everlasting	*Pseudognaphalium canescens*	Native
woolly lotus	*Lotus heermanii, =Acmispon heermannii* in the next *Jepson Manual* revision	Native
Woolly seablite	*Suaeda taxifolia*	List 4, Native