Lessingia filaginifolia var. *linifolia* (Del Mar Sand Aster)

Introduction

The MSCP Biological Monitoring Plan (1996) specifies the San Dieguito River Bluffs (i.e., 'Overlook Park' and 'Torrey Highlands') and Del Mar Mesa as *Lessingia filaginifolia* var. *linifolia* monitoring locations within the City of San Diego. However, no *L. filaginifolia* var. *linifolia* were located on Del Mar Mesa during 2001 City-wide reconnaissance surveys. Significant populations were found in the northeastern area of Carmel Mountain Park, though, and those sites ('Carmel Valley' and 'Carmel Mountain') have been monitored along with the San Dieguito River Bluffs sites since 2001.

Results

Site	Lead Monitor/s	Date	Method*	Result
Carmel Mountain (E)	Johnson	July 21, 2005	Census	353 Plants
Carmel Valley (aka Crml Mtn W)	Johnson	July 21, 2005	Census	730 Plants
Overlook Park	Johnson	July 29, 2005	Census	1,173 Plants
Torrey Highlands	Johnson	July 21, 2005	Census	1,184 Plants

* Please see the *City of San Diego MSCP Rare Plant Monitoring: Field Monitoring Methods* manual for a full description of plant monitoring methods.

All sites were surveyed by census, as had been done in previous years. At the Torrey Highlands and Overlook Park sites, areas that had not previously been mapped were found to support the species. It was not clear whether these subpopulations were present in previous years and the areas were not surveyed, or they are newly established areas. As such, 'survey areas' have been delineated on report maps to distinguish what areas were surveyed. Several areas of *L. filaginifolia* var. *linifolia* were noted at Carmel Valley, Overlook Park, and Torrey Highlands in 2005 that had not previously been reported, and new boundaries were mapped using submeter GPS technology (see attached aerial photographs). Population boundaries at Carmel Mountain East were substantially the same as in 2003 mapping (for population locations, please see the *City of San Diego MSCP Rare Plant Monitoring: Field Monitoring Methods* manual).

At nearly all the sites, *Carpobrotus edulis* (Highway Iceplant) was noted to be encroaching into *L. filaginifolia* var. *linifolia* habitat, even in interior areas. At the Carmel Mountain West site, it is present thoughout the area, and other invasives such as *Cortaderia* sp. (Pampas Grass), *Acacia* sp. (Acacia), and *Cistus ladanifer* (Gum Cistus) were observed in interior habitat areas of the site. Additionally, motorbike tracks were observed near the top of the mountain.

At the Overlook Park site, located along the San Dieguito River bluffs immediately north of the developed park, *Carpobrotus edulis* was noted in interior areas hanging in long strands from bluffs, then establishing at the bottom of the bluff. At this site, *Acacia* sp. (Acacia) has been planted just outside the adjacent property boundaries and is encroaching into native habitat. According to local residents, the *Acacia* was planted by the City in order to provide a fire fuelbreak. *Cortaderia jubata* (Pampas Grass) was also noted in areas near the residences, and

Ehrharta erecta (Panic Veldgrass), a newly reported and highly invasive non-native, was noted at the top of the slope just outside of the developed park area. It appears that this area and the areas planted with *Acacia* sp. are being artificially irrigated via sprinkler heads that have been installed in the area (approximately 10-15 feet outside of park fence, in an area formerly occupied by *L. filaginfolia* var. *linifolia*). Additionally, *Delosperma* sp. (likely *D. cooperi*; Hardy Ice Plant) was noted to be encroaching into native habitat from the adjacent developed Overlook Park.

At Torrey Highlands, further east along the San Dieguito River bluffs, *Carpobrotus edulis* is present in an area that supported *L. filaginifolia* var. *linifolia* in previous years. It is planted at the top of the ridge in the community park. *Mesembyanthemum crystallinum* (Crystal Iceplant) is also present at this site, though at lower densities than *C. edulis.*

Analysis

Plant populations at three of the monitoring sites from 2003-2005 were examined and correlated with water year rainfall using Microsoft Excel. All three populations appear to be affected by rainfall levels, however, the correlation was not statistically significant (Figures 7-9). Correlation analyses were not performed at Torrey Highlands due to uncertainty regarding previous search areas (for full discussion of this issue, please see the MSCP Rare Plant Monitoring: Field Monitoring Methods Manual, 2005).

Because there were only three observation years that could be included in the analysis, the test had only one degree of freedom, thus the r value, or correlation, would have had to have been near 100 percent to prove statistically significant (with more observations, the correlation can be slightly lower, e.g. a 95 percent correlation with three degrees of freedom, or five observations, would be significant). Thus, analyses with more data points (years) would likely show a statistically significant positive correlation.

Figure 8. *Lessingia filaginifolia* var. *linifolia* at Carmel Mountain East and Annual Rainfall, 2003-2005

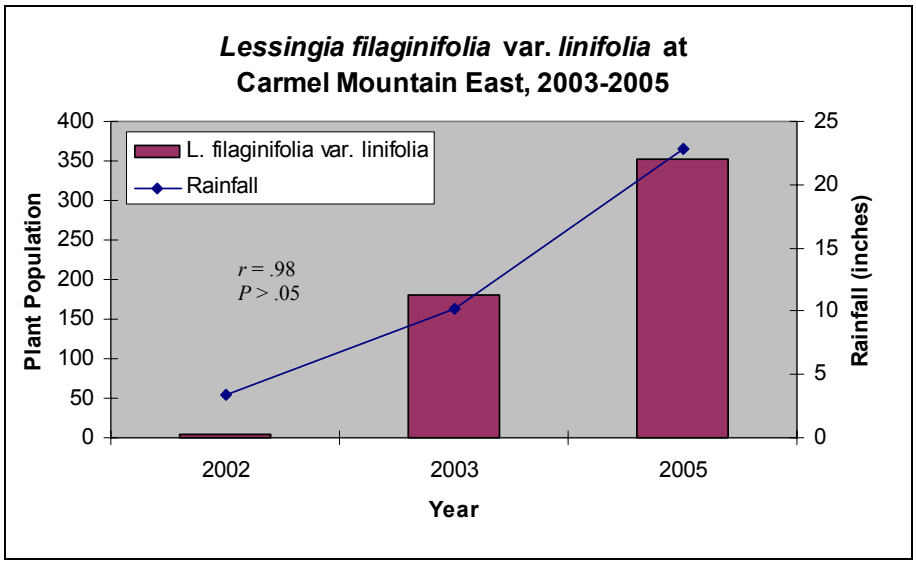


Figure 9. *Lessingia filaginifolia* var. *linifolia* at Carmel Valley and Annual Rainfall, 2003-2005

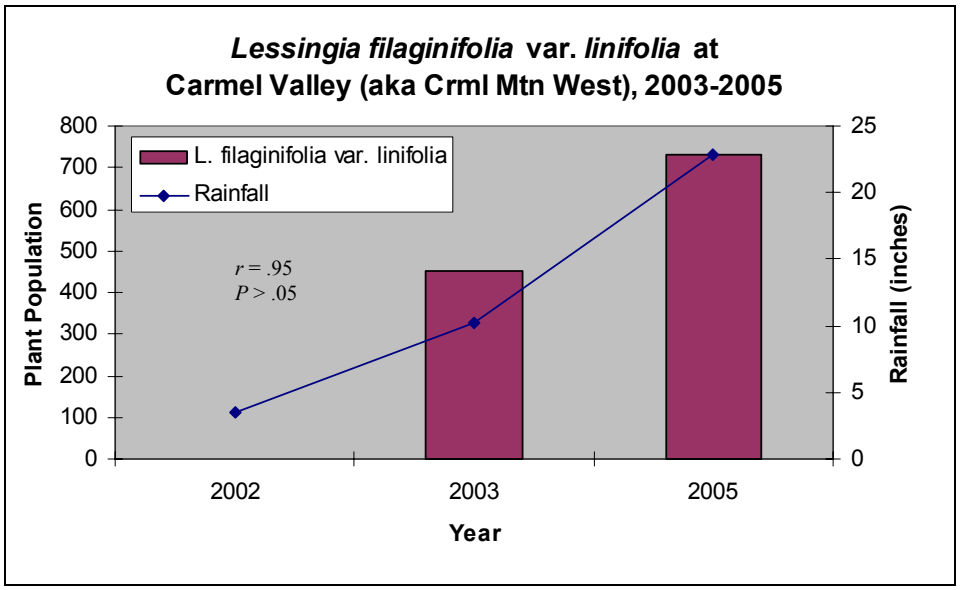
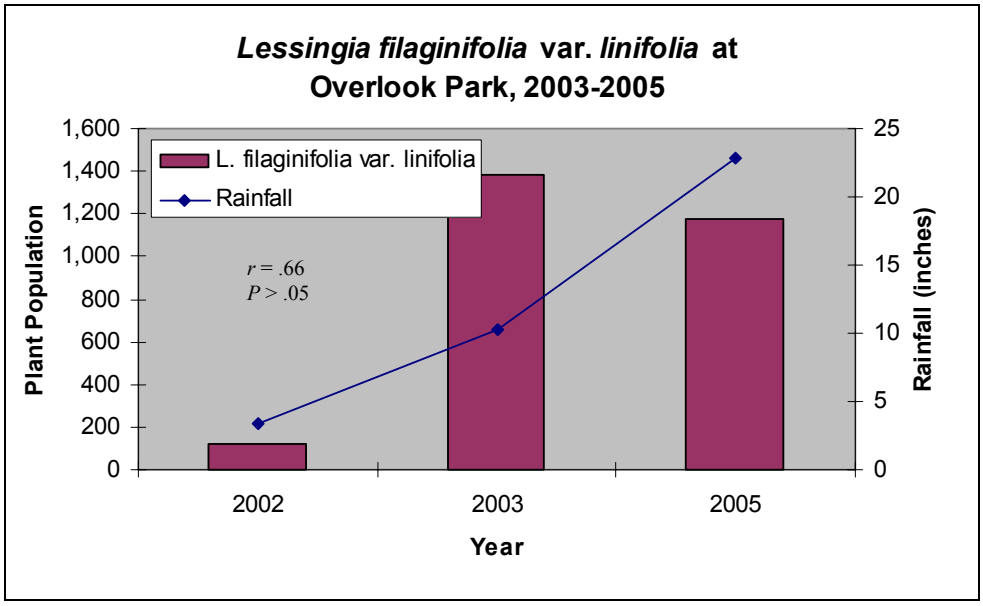


Figure 10. *Lessingia filaginifolia* var. *linifolia* at Overlook Park and Annual Rainfall, 2003-2005



Notes: 1) All rainfall data are from San Diego County Water Authority; data collected at Lindbergh Field (http://www.sdcwa.org/manage/rainfall-lindbergh.phtml). 2) Additional statistical analyses, such as confidence intervals, etc., are being performed by MSCP plant monitoring scientific advisors and will be used in revisions to the plant monitoring program.

Management Recommendations

Carmel Mountain East

Invasives such as *Carpobrotus edulis* (Highway Iceplant) should be controlled, and pedestrian and equestrian access in unpermitted areas should also be controlled.

Carmel Valley (aka Carmel Mountain West)

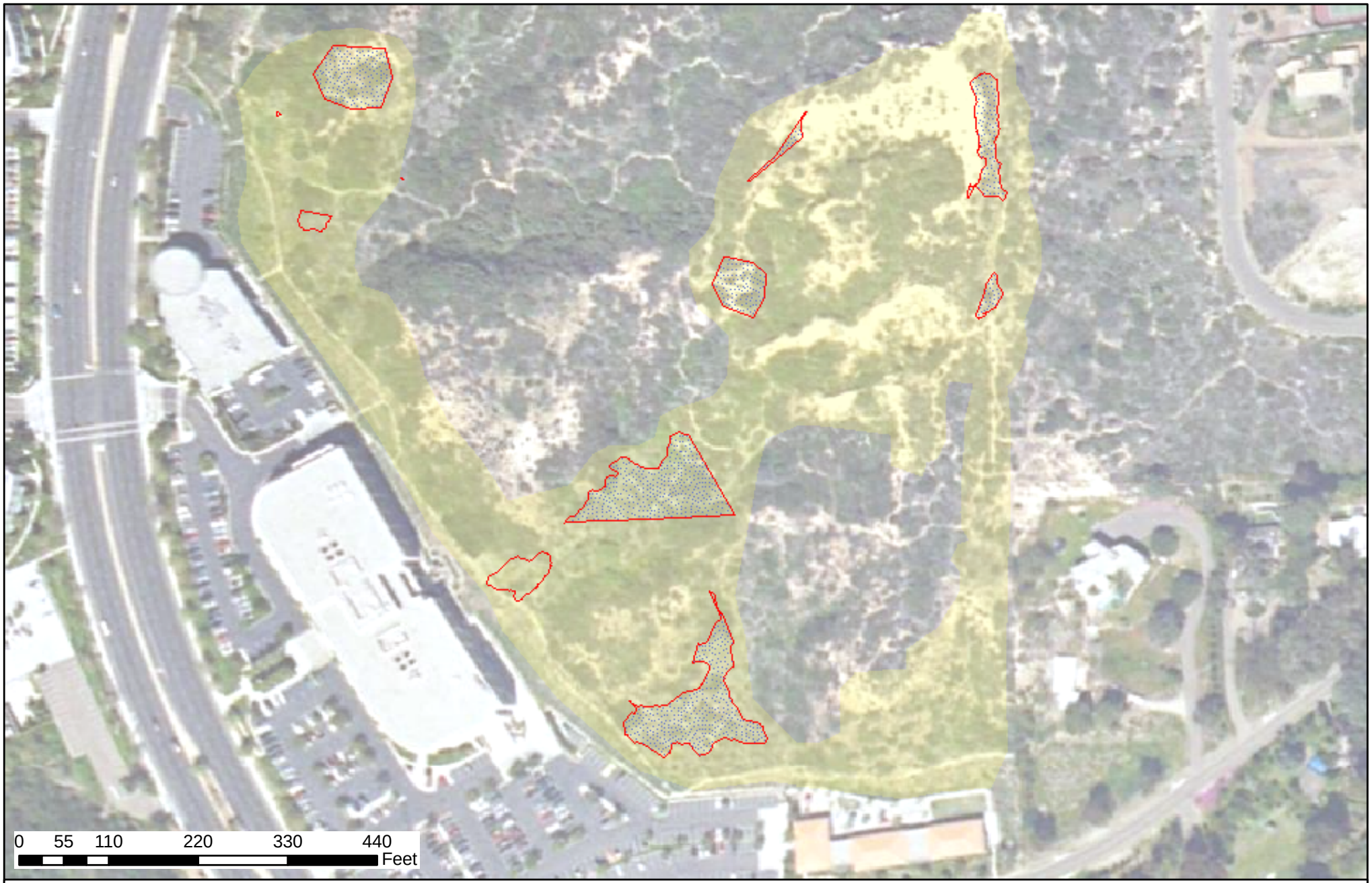
Invasives such as *Carpobrotus edulis* (Highway Iceplant), *Cortaderia* sp. (Pampas Grass), *Acacia* sp. (Acacia), and *Cistus ladanifer* (Gum Cistus) should be controlled, and unpermitted motorbike use in the area should also be controlled.

Overlook Park

Invasives such as *Carpobrotus edulis* (Highway Iceplant), *Acacia* sp. (Acacia), *Cortaderia jubata* (Pampas Grass), *Ehrharta erecta* (Panic Veldgrass), and *Delosperma* sp. (likely *D. cooperi*; Hardy Ice Plant) should be controlled. Artificial irrigation devices should be removed in preserve areas, and replanting areas of the adjacent community park with non-invasive species should be pursued.

Torrey Highlands

Control invasives such as *Carpobrotus edulis* (Highway Iceplant) and *Mesembyanthemum crystallinum* (Crystal Iceplant), and pursue replanting areas of the adjacent community park with non-invasive species.



2005 Population

2003 Population

Approximate Survey Area

Lessingia filaginifolia var. *linifolia*

Carmel Mountain West

Survey Date: July 21st, 2005

Source: M. Johnson, K. Syverson, J. Garcia, C. Ford

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