Dudleya brevifolia (Short-Leaf Dudleya)

Introduction

The MSCP Biological Monitoring Plan (1996) identifies Del Mar Heights/Crest Canyon and Carmel Mountain as City of San Diego Short-Leaf Dudleya (*Dudleya brevifolia*) monitoring locations.

Results

Site	Lead Monitor/s	Date	Method*	Result
Carmel Mountain	Greer/Johnson	May 19, 2005	Quadrat	123,200 Plants Density = 99.81 plants/m^2
Crest Canyon	Johnson	May 19, 2005	Census, GPS	Population Area (N SubPop) = 1,704 m2 Population (S SubPop) = 31 plants
Skeleton Canyon	Johnson	May 19, 2005	Presence/Absence	Present, Size Similar to Previous Years

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

The estimated population at Carmel Mountain in 2005 was 123,200 above-ground plants, up from 18,907 and 111,313 in 2004 and 2003, respectively. Population boundaries were checked against 2003 mapping, and boundaries were significantly the same (for population locations, please see the *City of San Diego MSCP Rare Plant Monitoring: Field Monitoring Methods* manual).

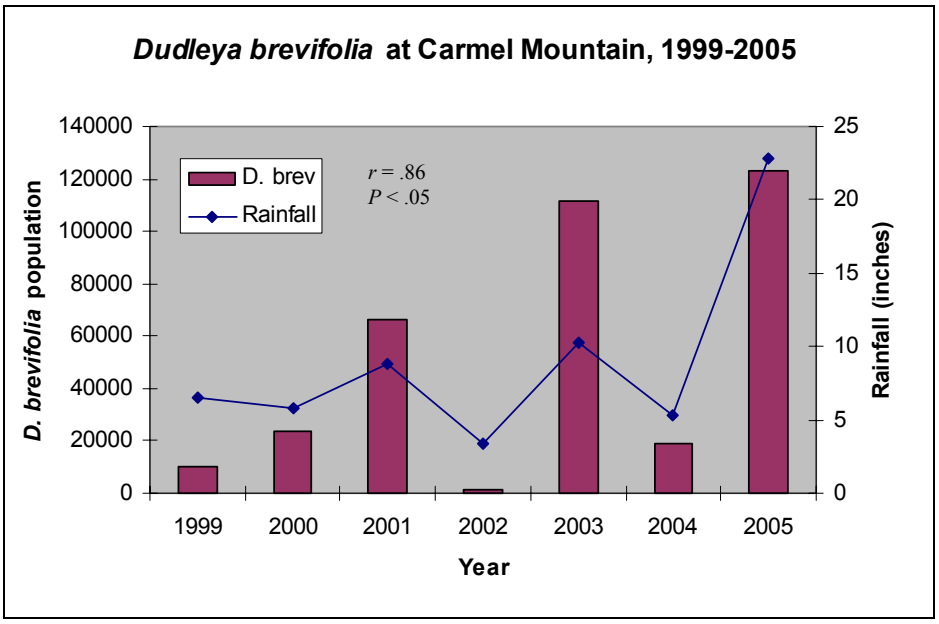
At the Crest Canyon site, a census of the southern subpopulation was taken. Population boundaries of the northern subpopulation were mapped; however, no census or quantitative monitoring was performed based on concerns regarding previous methods and trampling impacts, as well as input from Dr. Kathryn McEachern.

The UCSD Skeleton Canyon site was visited and a presence/absence survey was performed. The population is intact with no immediate threats, and appears similar in size and density as previous years.

Analysis

Carmel Mountain *D. brevifolia* plant counts from 1999-2005 were examined and charted with wet season rainfall using Microsoft Excel. The population exhibits a positive correlation with rainfall ($r = 0.8559$; $P < 0.05$; Figure 5).

Figure 5. *Dudleya brevifolia* at Carmel Mountain and Annual Rainfall, 1999-2005



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

Carmel Mountain *D. brevifolia* populations have been relatively stable since monitoring began, and efforts have been made in recent years to control pedestrian and equestrian access to these areas. However, continued use of these areas is evident and additional control efforts should be pursued. Stronger fencing should be considered, especially for subpopulations two and three, both of which are bisected by a trail.

Crest Canyon

The Crest Canyon sites continue to be impacted by unauthorized trails and are threatened by invasive plants such as highway iceplant (*Carpobrotus edulis)*. MSCP met with Park and Recreation staff in Fall 2005 to begin access control planning and preliminary invasives control planning. Senior Ranger Lori Charett organized a youth volunteer day and some of the initial access control work was done. A proposal has been submitted through the Transnet EMP Funding program for full trail work and to control invasives.

Skeleton Canyon

Skeleton Canyon is owned and managed by the University of California, San Diego. The Dudleya population at this site appears to be relatively stable and free from immediate threats. However, the canyon has several invasives threats (e.g., *Acacia* sp, *Nicotiana glauca, Cortaderia* sp., *Limonium sinuatum, Brassica nigra, Centaurea melitensis*) which could ultimately impact

the local Dudleya population. Pedestrian access issues may also be a problem in the future as there are multiple trails through the area, one of which is immediately adjacent to the Dudleya.