Acanthomintha ilicifolia (San Diego Thornmint)

Introduction

The MSCP Biological Monitoring Plan (1996) does not specify any San Diego Thornmint (*Acanthomintha ilicifolia;* Thornmint*)* monitoring locations within the City of San Diego; however, several sites have been monitored since MSCP inception and Citywide rare plant surveys in 2001. All Thornmint monitoring within the City was performed by volunteers in 2005.

Results

Site	Lead Monitor/s	Date	Method*	Result
Black Mountain Ranch	Mike Kelly	April 16, 2005	Census	120 Plants
Mission Trails	Mike Kelly	April 20, 2005	Census	120 Plants
Penasquitos Canyon	Mike Kelly	April 13, 2005	Census	2,091 Plants
Sabre Springs	Mike Kelly	April, 2005	Census	13 Plants

*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.

Analysis

Plant populations from 2000-2005 were examined and correlated with water year rainfall using Microsoft Excel. The Penasquitos Canyon Thornmint population exhibits a strong positive correlation with rainfall ($r = 0.9042$; $P < 0.05$; Figure 1). However, other sites do not show a similar correlation (Figures 2-4).

The most notable lack of rainfall correlation and population decline occurs at Sabre Springs, where only 13 plants were censused in 2005 as compared to 17,085 in 2004. Low numbers were also reported in 2002 (250 plants) at the site, however this may be partially explained by the extremely low rainfall in 2002 (3.44”). Mike Kelly, who surveyed all populations, reported that there appeared to be a die-off at the site during the growing season. He estimated that there were several thousand individuals at the Sabre Springs site three to four weeks prior to formal 2005 surveys. Then, when nearby populations were flowering, only 13 plants could be located at the Sabre Springs site. Possible explanations for the population crash are snail herbivory, herbicide damage, the Santa Ana heat wave, or competition. A heavy infestation of exotic snails was noted at the site in March, a phenomenon not previously noted. The prevalence of *Anagallis arvensis* (Scarlet pimpernel), a non-native invasive was also noted at the site. (Mike Kelly, personal communication via email, April 9, 2005).

At the Mission Trails site, 120 plants were censused. The population was lower in 2005 than both 2003 and 2001 (296 and 354, respectively), which were lower rainfall years (Figure 3). This site has been weeded by Mike Kelly for four years and burned in the Cedar Fire in Fall 2003. With weed removal and abundant rainfall, native Common Tarplant (*Deinandra fasciculata*) was abundant at the site in 2005 (estimated cover 95%). Shade from the Tarplant may affect the local Thornmint population. Additionally, non-native annual grasses, mustard (*Brassica* sp.), and Tocolote (*Centaurea melitensis*) are present at the site and may be causing

competitive pressure on Thornmint. Based on greenhouse competition experiments between Tocolote and Thornmint by Ellen Bauder, this non-native invasive species can negatively impact Thornmint (Mike Kelly, personal communication via email, 4/9/2005).

There were also relatively low numbers of Thornmint at Black Mountain Ranch (Figure 2), where 120 plants were censused in 2005; the plant numbers at this site have fluctuated between zero and 1,115 since first being surveyed in 2000. The low 2005 count was similar to the 105 count in 2004 and may be a normal population fluctation; however, based on the positive rainfall/Thornmint correlation that exists at the City's largest population in Penasquitos Canyon, the lower numbers in 2005 warrants careful watch.

Figure 1. *Acanthomintha ilicifolia* at Penasquitos Canyon and Annual Rainfall, 2000-2005

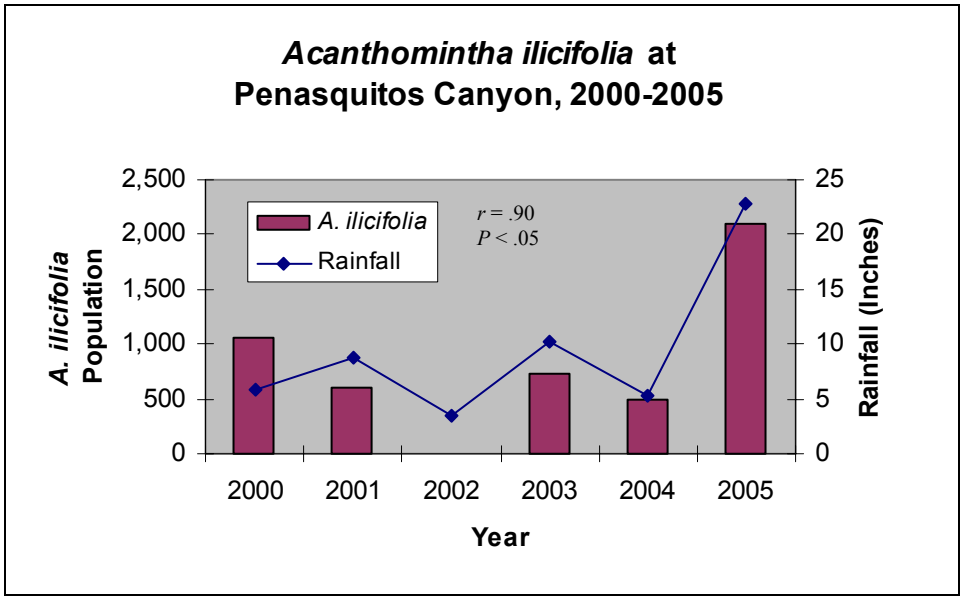


Figure 2. ***Acanthomintha ilicifolia*** **at Black Mountain Ranch and Annual Rainfall, 2000-2005**

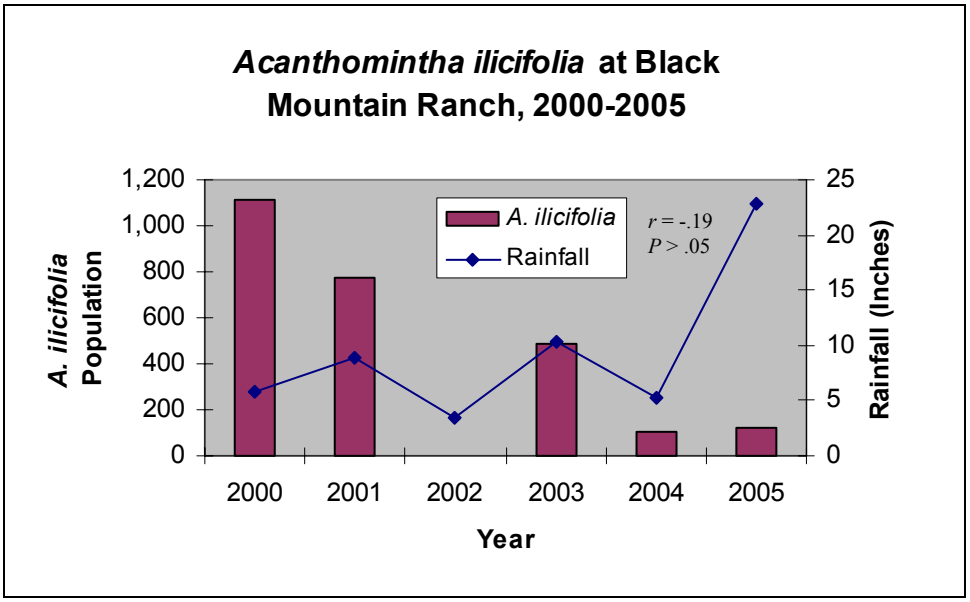


Figure 3. ***Acanthomintha ilicifolia*** **at Mission Trails and Annual Rainfall, 2000-2005**

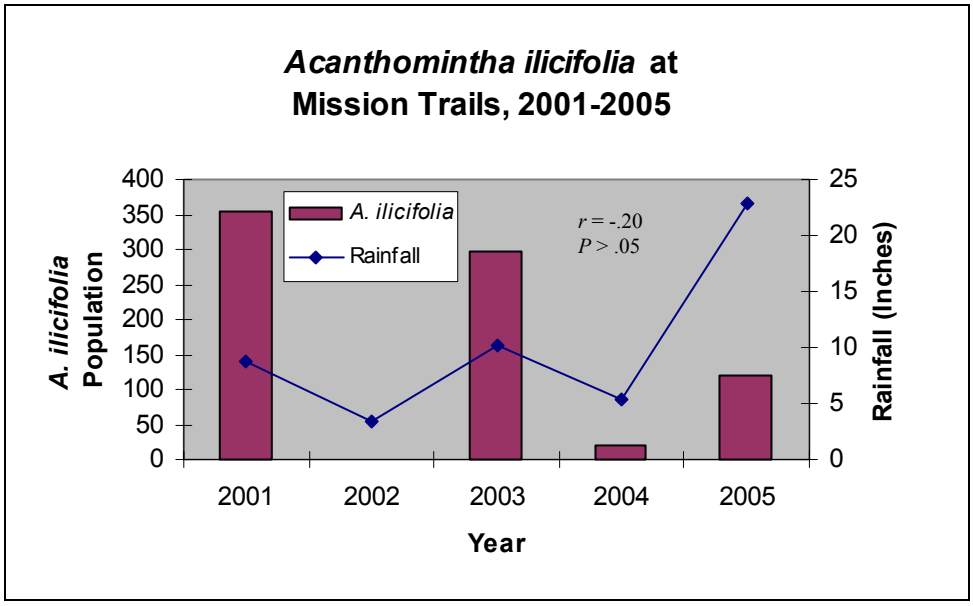
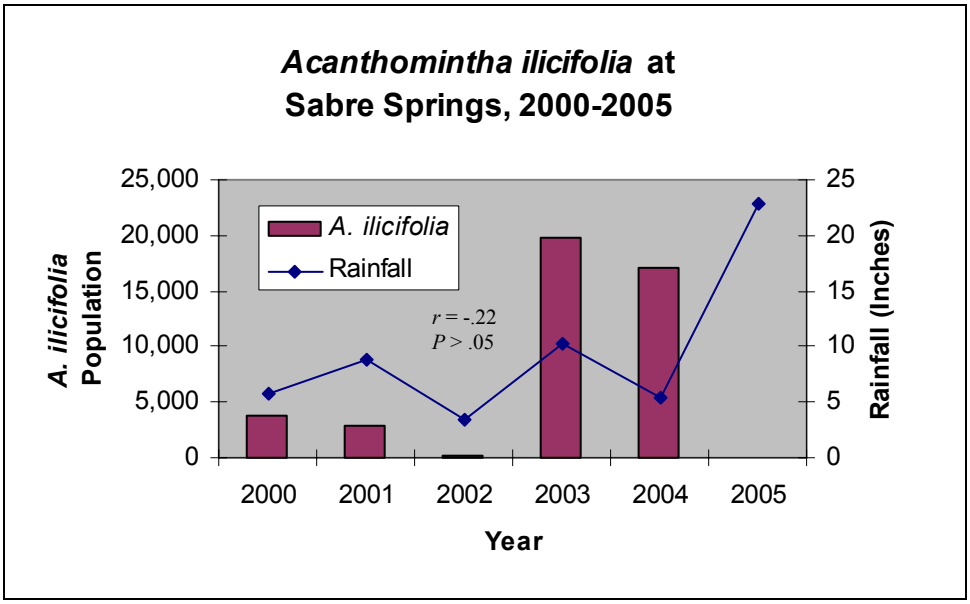


Figure 4. *Acanthomintha ilicifolia* at Sabre Springs and Annual Rainfall, 2000-2005



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

Black Mountain Ranch

Black Mountain Ranch Thornmint numbers were relatively low in 2005. The site should be inspected for non-native species and control of non-natives should occur, if necessary.

Mission Trails

Control of non-native plant species (e.g., non-native annual grasses, mustard [*Brassica* sp.], and Tocolote [*Centaurea melitensis*] should be pursued. Additionally, tests should be performed by removing or reducing Common Tarplant (*Deinandra fasciculata*) cover to determine if recent abundance of this native species is negatively impacting Thornmint in the area.

Penasquitos Canyon

The Penasquitos Canyon Thornmint population appears to be stable and is strongly correlated with annual rainfall. No immediate management actions are necessary at the site; however, the area should continue to be patrolled to insure that the site is not impacted by nearby trail users, and non-native species should be monitored at the site and controlled, if necessary.

Sabre Springs

The Sabre Springs Thornmint population appears to have been severely negatively impacted by some outside force, possibly non-native snail predation and/or non-native plant competition, in 2005. The site should be closely monitored and testing of different management actions (e.g., snail removal/eradication, non-native plant control) should be pursued.