

Dynamics of Prairie Plant Populations in t
OSMP Studies

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Annual Report: Dynamics of Prairie Plant Populations in the Open Space and Mountain
Parks

2003?

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Spet

SECTION 1, Abstract:

Permanently marked prairie plants in the Open Space were monitored to determine changes in numbers compared to previous years. Species studied were: *Andropogon gerardii*, *Artemisia frigida*, *Cirsium undulatum*, *Corypantha missouriensis*, *Eriogonum (Pterogonum) alatum*, *Euphorbia robusta*, *Evolvulus nutans*, *Liatris punctata*, *Opuntia macrorhiza*, *Psoralea tenuifolia*, *Talinum parviflorum*, and *Yucca glauca*. This data will be mapped into ArcView Geographic Information System program for analysis and future use. Flowering was determined and, in most species, plant size recorded. These data provide baseline information on plant survival patterns that indicate whether these populations are healthy and to which future changes can be compared.

Methods and Sites

Objectives: Determine changes the populations in 2003, by recording deaths and births (recruitment). Determine rates of growth of plants to size at flowering and estimate normal lifespans.

Plots – The plots were established near the permanent markers of Jane and Carl Bock. Plants have been mapped in 1 x 1 meter grids and the maps digitized in the GIS program ArcView. The plots are: 28 (Shanahan Ridge) 52 (Davidson Mesa), 57 (exclosure near Water Treatment Plant), 61 (Flatirons Vista), 102 (Chataqua Park Meadow). An additional site (“plot 70”) was added in 2002 (see Table 1).

Table 1. Plots Studied (map at end)

Bock Plot Number	Plot Location	Finding Plot from Bock Permanent Marker
28	Boulder Greens Venture, Shanahan Ridge	Marker is SW corner of plot
52	Davidson Mesa	Plot is in same pasture as marker but orients to the fence line: it is 3 m N, 3 m W of the second post, running N & W
57	Open Space Maintenance, grazing exclosure	Marker 57 is in the same half of the exclosure as the plot but the plot orients to the fence: about 100 m from the NW corner of the exclosure; 8.4 m E of 20th fence post (counting all types of posts) or 9.8 m. at 300° from the 7th wooden fence post. Plot runs 10 m E and 10 S of that spot.
61	Flatirons Vista Wildlife Transect	Marker is NW corner of plot
70 (Keeler #)	Greenbelt Plateau Trailhead. Not a Bock & Bock number.	Plot is W of trailhead, at NE side of intersection of 93 and 128.
102	Chataqua Park Meadow	Plot begins 3 m N of Bock marker, runs 7 m S, 3 m N (10 m W)

Plants --The species studied (Table 2) are all perennials, ranging from short-lived to very long-lived, from a variety of families. The plants have diverse heights and microhabitat preferences, to better detect change in the OS&MP. Too rare to really study but observed when seen are: *Asclepias speciosa*, *stenophylla* and *viridiflora* (Asclepiadaceae plot 52).

Table 2. Distribution of species studied among plots.
Number in box is number of years studied. (through 2002).

Plant	Family	Plots					
		28	52	57	61	70	102
<i>Andropogon gerardii</i>	Poaceae		X	X	X		X
<i>Artemisia frigida</i>	Asteraceae			X	X	X	
<i>Artemisia ludoviciana</i>	Asteraceae	X					X

<i>Cirsium undulatum</i>	Asteraceae		x	x	x		
<i>Coryphantha missouriensis</i>	Cactaceae	x	x	x	x		
<i>Dalea purpurea</i>	Fabaceae	x			x		
<i>Eriogonum alatum</i>	Polygonaceae		x	x	x	x	
<i>Euphorbia robusta</i>	Euphorbiaceae		x				
<i>Evolvulus nutans</i>	Convolvulaceae		x	x		x	
<i>Liatris punctata</i>	Asteraceae			x	x	x	x
<i>Opuntia macrorhiza</i>	Cactaceae	x	x	x	x		x
<i>Psoralea tenuiflora</i>	Fabaceae	x			x		x
<i>Talinum parviflorum</i>	Portulacaceae	x		x			
<i>Yucca glauca</i>	Agavaceae		x	x			

Plants are permanently mapped. In July 2003 the maps from 2002 were compared to the actual plots and changes in the populations noted.

As of the time of this writing, most species have not yet been mapped onto the GIS program nor the 2003 data analysed.

Supplemental activities in 2003: I collected plants of *Eriogonum alatum* near the permanent plots to compare the measurements made in 2002. I recaptured marked rosettes from 2002 to evaluate the size required for flowering and compare sizes between hermaphrodite and female plants. I collected *E. alatum* north along the Front Range and into Utah, comparing sex ratios and insect herbivores. Study of those plants has just barely begun at this time.

For *Eriogonum alatum*, *Opuntia macrorhiza* and *Coryphantha missouriensis* I am trying to analyze the data and write manuscripts for publication.

I will get all this done, but at the present it is not far enough along to say much.

My observations on moths eating *Eriogonum alatum* included a new host record, which is in press in *The Great Lakes Entomologist*. I thought the pattern odd: *Chlorochlamys chloroleucana* (Lepidoptera, Geometridae) is found on many plant families but not Polygonaceae. Its range goes east to the Atlantic Ocean. However, a *Chlorochlamys* species from the southwest and another from the far west are pretty well restricted to Polygonaceae. My insect taxonomist coauthor, George Balogh, is convinced our insect identification is correct. I thought it worth documenting: my experience

suggests there's a cryptic species here.