

**California Department of Parks and Recreation
Natural Resources Division**

Sandhills Monitoring At Wilder Ranch State Park

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by
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I. Introduction

A.) Background

In Proceedings from the Conservation and Management of Rare and Endangered Plants, Marangio and Morgan (1987) describe the sandhills plant community in Santa Cruz County. These unique plant communities are only found on inland marine deposits of sand classified as Zayante soil series and are distributed from the Bonny Doon (northwest of Santa Cruz) to Scotts Valley area (north of Santa Cruz). [Zayante soils are found in the Corralitos area north of Watsonville but do not support sandhills plant community (USFWS 1998).] Fast draining and nutrient poor soils in a coastal climate, such as the Zayante series, are rare in California and here support unique plant and animal species. Two types of plant communities occur on the sandhills, dominated by either Ponderosa pine (*Pinus ponderosa*) or silverleaf manzanita (*Arctostaphylos silvicola*), have been described by Marangio and Morgan (1987). The Ponderosa pine dominated community is known as “parkland” because of wide spacing between the trees and associated herbaceous species with little or no shrub understory. Conversely, the “silverleaf manzanita chaparral” is dominated by silverleaf manzanita and comprised primarily of shrubs. Existing vegetation on these sandhill “biological islands” may be remnant of a more extensive habitat, now obliterated, disturbed, or fragmented from sand quarrying, agriculture, and residential development.

In response to the dwindling numbers and threats to the populations of endemic species found in the sandhills plant community, the United States Fish and Wildlife Service has listed as endangered three plants (Ben Lomond wallflower [*Chorizanthe pungens* var. *hartwegiana*], Scotts Valley spineflower [*C. robusta* var. *hartwegii*], and Ben Lomond wallflower [*Erysimum teretifolium*]) and two insects species (Mount Hermon June beetle [*Polyphylla barbata*] and Zayante band-winged grasshopper [*Trimerotropis infantilis*]). A single recovery plan for these endangered species and other species of concern also restricted to the Santa Cruz Mountain sandhills was finalized in 1998 (USFWS 1998).

The sandhills plant community occurs in three park units in Santa Cruz District of the California Department of Parks and Recreation: Big Basin State Park, Henry Cowell State Park, and Wilder Ranch State Park. On the Gray Whale acquisition property of Wilder Ranch State Park, there is approximately 45 hectares (111 acres) of sandhills chaparral calculated using rectified aerial photography and a geographic information system (GIS). Currently, the Gray Whale property is closed to public access, though occasional trespassing by equestrians, hikers, and mountain bike riders, does occur (personal observation). The federally endangered Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*) is known to occur there (Tim Hyland, personal communication). The Santa Cruz District’s Inventory, Monitoring, and Assessment Plan for Wilder Ranch State Park identified the lack of specific local knowledge about this sandhill community as a project for the Natural Resources Division support team.

B.) Actions

The following is an overview of the actions the Natural Resources Division (NRD) IMAP support team conducted regarding the Wilder Ranch State Park sandhills (in chronological order).

April 27, 2000—Quail Hollow County Park

Jim Barry (Natural Heritage Section), Laurie Archambault (formerly NRD IMAP support team, now at Northern Service Center), and Tamara Sasaki (NRD IMAP) attended Santa Cruz Biodiversity Council meeting focused on the Santa Cruz Sandhills. This was an excellent introduction to the sandhills of the Santa Cruz Mountains. Steve Singer gave an overview of the Santa Cruz sandhills and Suzanne Schettler discussed the sandhills plant community and her restoration project at a local sand quarry. After the meeting, Ms. Schettler led a field trip to the sandhills at Quail Hollow County Park. This particular community was an example of a sandhills parkland. Ms. Schettler pointed out the endemic plant species and the experimental research sites of Jody McGraw, University of California, Berkeley doctorate student.

May 3 & 4, 2000—Initially, permanent monitoring transects were proposed to monitor the sandhills. Laurie Archambault and Tamara Sasaki conducted a pilot study to determine if the proposed method was feasible and efficient. A 185 m transect was established in the sandhills chaparral. See below for methods, results, and recommendations.

April 24, 2001—*Chorizanthe pungens* var. *hartwegiana* pilot study by Tamara Sasaki and Pat Gilbert (both from NRD IMAP).

June 6, 7, 12, 13, & 28, 2001—*Chorizanthe pungens* var. *hartwegiana* surveys were conducted by Tamara Sasaki, Gary Walter, and Craig Swolgaard (all from NRD IMAP). See IMAP *Chorizanthe pungens* var. *hartwegiana* Report for the location of CHPUH and results of the surveys.

June 28, 2001—Tamara Sasaki and Pat Gilbert (both NRD IMAP) met with Caitlyn Bean, San Jose State graduate student, studying Santa Cruz Kangaroo rats (*Dipodomys venustus*) for her master's thesis. She showed us the two trap lines she set at the Wilder Ranch State Park sandhills. She did not capture any Santa Cruz Kangaroo rats. See IMAP Small Mammal Trapping Report for trap line locations and results.

September 24-28, 2001—Small Mammal Trapping

Dr. Douglas Kelt, mammology professor, University of California at Davis, put a trap line for small mammals along the west edge of the north most sandhill. See the IMAP Small Mammal Report for his results.

October 24, 2001—Quail Hollow Quarry

Tim Hyland (Santa Cruz District) and Tamara Sasaki (NRD IMAP) visited Quail Hollow Quarry with San Jose State University master's student, Jennifer Chu. Our objective was to learn to identify the federally endangered Zayante band-winged grasshopper (*Trimerotropis infantilis*) and its habitat so we could look for it at Wilder Ranch State Park sandhills (Gray Whale acquisition). The Zayante band-winged grasshopper (ZBWG) habitat at Quail Hollow Quarry is sandhills parkland on the north side of a ridge. The dominant plant was *Lupinus albifrons*. Our visit was late in the season for the ZBWGs. Fortunately, we did observe both male and female grasshoppers. Ms. Chu is trying to identify the host plant species occurring in the ZBWG frass or excrement through microscopic analysis. She will compare the proportions of each plant species found in the frass with the plant species composition in the field and from field observations. See photographs in Appendix A.

A.) Contacts

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II. Methods

The following are the methods used in the pilot study for the Wilder Ranch State Park (Gray Whale property) sandhills plant community. A 185 m point intercept-line transect was established on a bearing of 62 degrees (17 degrees east declination) from the southwest edge of the sandhills chaparral near the access road.

Rebar stakes were used to monument the beginning (0 m), "middle" (100m) and end (185 m) of the transect. The 0 m stake (approximately 15.24 cm rebar) is at a compass bearing of 101 degrees and a distance of 10 meters from a large *Quercus agrifolia* at the edge of the access road. The approximate 0 m stake location is UTM N: 4091048, E: 579601.

The transect covers terrain from an area of gentle to steep slope, ending at the top of a small hill. A 100 m tape was threaded through the dense vegetation at approximately 1 meter from the ground. Every 0.5 m along the tape, all the plant species intercepted by an imaginary line perpendicular to the tape were recorded at the herb (≤ 1 m), shrub (< 1 -2.5 m), and tree layers (> 2.5 m). Incidental species that were not recorded along the transect were documented. The 100 meter tape was then used to lay the remaining 85 m of the transect and data

collected using the same method as for the first 100 m of the transect. See Site and Transect maps in Appendix B.

III. Findings/Discussion

The chaparral shrubs dominated the shrub layer (91 percent cover) of this transect. The most frequent shrub species encountered included *Arctostaphylos tomentosa* ssp. *crinita*, *Arctostaphylos tomentosa* ssp. *crustacea*, *Ceanothus cuneatus*, and *Rhamnus californica*. Both the herb (8 percent cover) and tree (16 percent cover) layers were minor components of this transect. Litter (94 percent cover) primarily covered the soil beneath the shrubs. There were some gaps of mostly bare ground with scattered herbs between the shrubs. *Chorizanthe pungens* var. *hartwegiana* plants in leaf (rosette of spoon-shaped leaves) were observed in some of the gaps; however, this species was not encountered along the transect. See Appendix C for the raw transect data and photographs. During the course of the fieldwork, a plant species list was compiled. See Appendix D for the species list.

The establishment and data collection for this 185 m transect was very labor intensive and time consuming. It took two people a total of two days to establish this transect and to collect the data. The shrubs are dense and threading the meter tape through along the compass bearing was slow. From two days of fieldwork traveling near the tape, the impact to the shrub vegetation was obvious. It would be worthwhile to explore other methods of documenting the sandhills plant community that are more efficient, less time consuming, and with less impact to the vegetation. Since most of the sandhills chaparral is comprised of perennial shrubs, periods between monitoring could be 5-10 years or more, provided there were no catastrophic events that changed the existing plant community.

IV. Data Management

- Field data was copied and is stored in two separate locations at the IMAP office.
- All GPS waypoints were stored in rover files, which were downloaded onto GPS Pathfinder software and differentially corrected. These were stored electronically and used as shapefiles in an Arcview GIS project.
- A CD accompanies the report containing-
 1. A copy of the report.
 2. Excel databases: Sandhill Species & Sandhill Transect.
 3. A folder containing pertinent digital photographs, titled Sandhills.
 4. An Arcview project: Sandhills & chor. apr. This project covers both the sandhills study and the chorizanthe study conducted in the same location at Wilder Ranch State Park.

V. Recommendations

As an alternative to monitoring the sandhills chaparral, an indicator species could be used to assess the health of the sandhills plant community. The Ben Lomond spineflower, *Chorizanthe pungens* var. *hartwegiana*, is found in the gaps of the chaparral and would be a potential candidate. See the IMAP CHPUH report regarding specific recommendations for monitoring and management considerations.

In general, the IMAP support team recommends Santa Cruz District representation at the Santa Cruz Biodiversity Council meetings; especially when the agenda has sandhills speakers or topics to keep up-to-date on new research, land management actions, etc. In addition, endangered species and species of special concern from the Santa Cruz Mountains (per the USFWS Recovery Plan) should be surveyed for at the Wilder Ranch State Park sandhills (Gray Whale acquisition property), e.g., Zayante band-winged grasshoppers, etc.

VI. References

Hyland, Tim. 2000. Santa Cruz District Assistant State Park Resource Ecologist, personal communication.

Marangio, M. and R. Morgan. 1987. The endangered sandhills plant communities of Santa Cruz County. In Conservation and management of rare and endangered plants, proceedings from a conference of the California Native Plant Society, T.S. Elias, editor. 267-273.

United States Fish and Wildlife Service (USFWS). 1998. Recovery plan for insect and plant taxa from the Santa Cruz Mountains in California. U.S. Fish and Wildlife Service, Portland, Oregon. 82 pages.

Contacts

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Botanist:

Tim Hyland, Assistant State Park Resource Ecologist
Santa Cruz District

Appendix A

**Zayante band-winged grasshopper photographs from Quail Hollow Quarry
Santa Cruz County, California
10/24/01**



Photograph 1: Quail Hollow Quarry (North Ridge area)
Zayante band-winged grasshopper habitat. Jennifer Chu, SJSU graduate student (bending down) and Tim Hyland, Santa Cruz District Resource Ecologist (standing) in the background.



Photograph 2: Zayante band-winged grasshoppers (*Trimerotropis infantilis*). The male is smaller in size (on left) than the larger female (on right).

Appendix B

**Sandhills Site and Vegetation Transect Maps
Wilder Ranch State Park
Santa Cruz, Santa Cruz County, California**

Appendix C

Datasheets from 200 meter transect at Wilder Ranch State Park sandhills

Appendix D

**Partial Species List of the Wilder Ranch State Park
Sandhills Chaparral Plant Community
(Gray Whale)**

Partial Species List of Plants Observed in the Sandhills Chaparral Plant Community of Wilder Ranch State Park (Gray Whale)

Adenostoma fasciculatum*
Aira caryophylla*
Arctostaphylos silvicola*
Arctostaphylos nummularia^
Arctostaphylos tomentosa ssp. crustacea*
Arctostaphylos tomentosa ssp. crinita*
Baccharis pilularis^
Briza maxima^
Ceanothus cuneatus*
Ceanothus papillosa (in bloom)*
Chorizanthe pungens var. hartwegiana*
Chorizanthe diffusa^
Chrysopsis chrysophylla*
Cryptantha clevelandii^
Elymus glaucus^
Ericameria arborescens*
Eriodictyon californicum^
Galium sp. (yellow flowers in bloom)*
Galium sp. (woody perennial, climbing)^
Garrya elliptica*
Gnaphalium sp.
Helianthemum scoparium*
Heteromeles arbutifolia*
Hypocharis radicata^
Hypocharis glabra^
Lithocarpus densiflorus*
Lotus scoparius*
Luzula multiflora?^
Madia madioides*
Melica imperfecta^
Mimulus aurantiacus*
Navareetia hamata ssp. parviloba^
Pentagramma triangularis^
Pickeringia montana^
Pinus attenuata*
Pinus ponderosa^
Poaceae sp. (possibly Nasella)*
Polygala californica^
Pseudotsuga menziesii var. menziesii*
Pteridium aquilinum*
Quercus agrifolia^

Quercus berberidifolia*
Quercus parvula var. shrevii*
Rhamnus californica ssp. californica*
Ribes divaricatum var. pubiflorum*
Rosa sp.*
Rubus ursinus*
Rumex acetosella*
Sambucus californica^
Satureja douglasii*
Sequoia sempervirens*
Smilacena stellata^
Spergula arvensis ssp. arvensis*
Toxicodendron diversifolium*
Triphysaria pusilla*
Umbellularia californica*
Vaccinium ovatum*
Vulpia octoflora*

*May 4, 2000 by Laurie Archambault

^June 2001 by Tamara Sasaki