



Cooperative Habitat Restoration of a California Grassland

Pinnacles National Monument
National Park Service

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Introduction

McCabe Canyon is a newly acquired area of Pinnacles National Monument that contains an extensive field of intact native grasslands considered extremely rare in California. Two culturally important species can be found in high numbers here - deergrass (*Muhlenbergia rigens*) and white-root sedge (*Carex barbarae*). Both of these species are highly valued as basketry material by Mutsun and other California Indian peoples, and have a long history of traditional management and use. Currently the species are not managed and are threatened by invasive weeds, exotic pigs, and possibly the absence of certain traditional tending practices. Our integrated habitat restoration approach will restore and protect these unique natural and cultural resources using traditional tending techniques, while also emphasizing the role of California's first inhabitants in shaping the natural landscape over centuries of time.



Over 2 acres of white-root sedge in McCabe Canyon



2 acres of deergrass in McCabe Canyon

Research Questions:

- 1) How does the plant community respond to various techniques to manage deergrass (*Muhlenbergia rigens*) and white-root sedge (*Carex barbarae*)?
- 2) Which technique (burning, mechanical removal, or no action) is most effective at increasing flower stalk production for deergrass?
- 3) Does mechanical thinning of white-root sedge aid in achieving the desired quantity and quality of materials for practitioners?

Methods: White-root Sedge

- Pairs of 2 x 2m plots placed in dense stands of white-root sedge
- Treat randomly selected plots using traditional tending practices, i.e. thinning of vegetative material, removal of rocks and debris and removal of other plant species
- Sample species richness and foliar plant cover before, after, and periodically during treatment
- Evaluate rhizomes for straightness, usable length, color, node density and tensile strength, based on practitioners standards

Methods: Deergrass

- 2.5 x 2.5m plots placed in deergrass beds
- Treat randomly selected plots with burning, clipping, or no treatment
- Count current year's inflorescence stalks to develop average inflorescence number per plant, before and after treatment
- Count mature deergrass plants before and after treatment
- Sample species richness and foliar plant cover before, after, and periodically during experiment



Basket weaver Julie Dick Tex explains how to tend and harvest white-root sedge



The flowering stalks of deergrass are harvested for basket making

Objectives

- Restore condition of botanically and culturally significant vegetation communities in McCabe Canyon to a reference state inclusive of cultural management.
- Reintroduce traditional resource management techniques and determine flora and fauna response.
- Connect this natural area in Pinnacles NM to the demonstration Re-learning Garden at the UCSC Arboretum.
- Gain a better understanding of environmental and fire history of the site
- Incorporate an archaeology component to include both surface and sub-surface level survey
- Convey to the public how California's first people shaped the landscape and how these concepts are linked to contemporary California Indian culture
- Produce an Amah Mutsun Basketry Type Collection for both display for educational purposes and for park archives
- Form lasting working relationships with project partners



Project partners meet to create an action plan for McCabe Canyon

Photo by Paul Johnson

Related outcomes

Tribal-federal partnership

- It can often be difficult for both tribes and agencies to interact collaboratively in cases where a tribe has yet to regain its Federal status, as is the case with the Amah Mutsun. This project avoids many associated pitfalls by moving forward in a scientific context, with the tribe as a full research partner.
- Here, both the Tribe and the Park benefit through shared research and cultural networks, shared resources and expertise, and shared investment in the outcome of the research.

Improved interpretation and public programming

- Through this research context, the Park can now benefit from local knowledge of tribal peoples, as well as the research products. Efforts are currently underway to expand this element of the study.

Re-learning

Pinnacles is a venue for researching, relearning, and reconstructing traditional land uses, cultural practices and management techniques. Research at Pinnacles will inform the Re-learning Garden at the UC Santa Cruz Arboretum.

The Arboretum Re-learning garden will:

- Be a community oriented learning center dedicated to the conservation and preservation of culturally important plants
- Provide a place where the Amah Mutsun community can more easily have access to plant material resources
- Be an educational resource for students and community members and a storehouse of cultural and historical knowledge of plants

Fire Science

- Joint Fire Science grant awarded for 2010-2013: Exploring the traditional use of fire in the coastal mountains of Central California.
- Methods will be tested to confirm the affect of fire on opal phytoliths, small silicate structures deposited by native grasses in large quantities over time, which will also be used to reconstruct historic vegetative cover type and potentially an indigenous fire regime at McCabe Canyon.
- This project will also link to and expand on fire history work currently underway at the Quiroste Valley State Cultural Preserve (San Mateo Co.) based primarily on fire scar analysis in coastal redwoods (*Sequoia sempervirens*).
- Partners include Pinnacles National Monument, Bureau of Land Management, Año Nuevo State Park, UC Berkeley, Amah Mutsun Tribal Band, San Francisco Estuary Institute.



Fire scar