



***Yucca schidigera* Ortgies**
 Mojave yucca **Agavaceae**

Illustration by Fred M. Roberts

Symposium Program

40th Annual Southern California Botanists Symposium

Southern California Plant Communities:

Threats and Solutions

Saturday, November 1st, 2014

Pomona College—Seaver Auditorium

8:00-9:00 am Registration

9:00-9:15 am Introductory Comments by Naomi Fraga

9:15-10:00 am **Threats To Southern California
 Communities**

Allan A. Schoenherr Professor of Ecology
 Emeritus, Fullerton College

Population growth and development lead to habitat destruction and fragmentation of habitats. These are the primary threats to communities of native plants in southern California. A well-known and related phenomenon is the replacement of native plants by invasive species. Also, in urbanized areas there is the demonstrated threat on plant health from the components air pollution such as ozone and oxides of nitrogen.

More insidious, and slow-moving are the threats posed by climate change. The causes and consequences of global warming are well documented. Among the predictions of climate change are that dry regions will become drier, and wet regions will become wetter. Regions associated with Mediterranean climate, therefore, will likely become hotter and drier. What does that mean for plants and animals that already may be living on the margins of their environmental tolerances and/or requirements? It could be that spring will arrive earlier and summer will last longer. Fire frequency and intensity would be altered. Blooming seasons could be modified. Pollinator abundance and dispersal agents may not be synchronous with abundant flowers. Distribution of some species would likely become shifted northward or to higher elevations, whereas animal associates may not be able to keep up with the change. Some extinctions are likely to occur. Coincident with climate change we already are witnessing some species, weakened by drought, becoming threatened by damaging pest invasions.

In the long run, native plant communities may become composed of species that are more drought tolerant and/or resistant to pests and fire.

10:00-10:30 am **Gaining A Greater Perspective
 On The Threats Faced By The Rare Flora Of
 California**

Nick Jensen M.S. Student at Rancho Santa Ana
 Botanic Garden/Claremont Graduate University
 and **Shannon M. Still** Conservation Scientist at
 Chicago Botanic Garden

Assessing the conservation status of and setting priorities for the preservation of California's rare flora requires an accurate picture of the threats faced by each species. We identify the top threats to more than 1,700 plants considered rare by the California Native Plant Society (CNPS) using the California Natural Diversity Database (CNDDB). In order to better understand these threats, we analyze patterns based on federal or state Endangered Species Act status, CNPS threat ranks, life history, habitat, and other categories. By looking at the causes of the extirpation of more than 1300 rare plant occurrences we identify which of these threats pose the greatest peril to California's plant biodiversity. Using CNDDB datasets from 2005 and 2014 we track changes in the rates of threats statewide, and attempt to explain the causes of proportional increases or decreases in certain categories over this nearly ten-year period. We present the spatial distribution of threats as an aggregate of all categories, and on an individual threat basis focusing on Southern California. This work provides a basis for the better understanding of the threats to California's rare flora, and a framework for future analyses. We present ideas on how our work might lead to better land management decisions and solutions to some of the primary threats facing the highly storied rare flora of California.

10:30: 11:00 am Break

11:00-11:45am **California's Fading
 Wildflowers**

Richard Minnich Professor of Earth Sciences at
 the University of California, Riverside

Early Spanish explorers in the late eighteenth century found springtime California covered with spectacular carpets of wildflowers from San

Francisco to San Diego. Yet today, invading plant species have devastated this nearly forgotten botanical heritage. In this lively, vividly detailed work, Richard A. Minnich synthesizes a unique and wide-ranging array of sources—from the historic accounts of those early explorers to the writings of early American botanists in the nineteenth century, newspaper accounts in the twentieth century, and modern ecological theory—to give the most comprehensive historical analysis available of the dramatic transformation of California's wildflower prairies. At the same time, his groundbreaking book challenges much current thinking on the subject, critically evaluating the hypothesis that perennial bunchgrasses were once a dominant feature of California's landscape and instead arguing that wildflowers filled this role. As he examines the changes in the state's landscape over the past three centuries, Minnich brings new perspectives to topics including restoration ecology, conservation, and fire management in a book that will change our view of native California.

11:45 am- 1:15 pm Lunch

1:15-2:00 pm **When Weeds Attack - A Litany Of Loathsome True Tales Of Invasive Species Impacts On The Native Plant Communities Of The Santa Monica Mountains**

Christy Brigham Chief of Planning, Science and Resource Management, Santa Monica Mountains National Recreation Area

Over a decade of research by National Park Service scientists and other researchers have shown a wide variety of impacts of invasive species on native plant communities including reduced species richness, changes in soil ecology, changes in foraging patterns of herbivores, and altered fire frequencies. In this overview, I will discuss research findings on both what impacts invasive species have on species and communities as well as some of the mechanisms that may allow these species to dominate such as high seed production, superior seed germination and growth, and physiological plasticity. Specifically I will cover research findings on impacts of tocalote and annual grass on a federally threatened plant, *Pentachaeta lyonii*; changes in soil communities from Harding grass (*Phalaris aquatica*), and reductions in species richness from a wide suite of invasive plant species.

2:00-2:30 pm **Predicting current and future distributions of rare plants: lessons from the California deserts**

Patrick McIntyre Lead scientist with the California Natural Diversity Database at the CA Dept. of Fish and Wildlife in Sacramento

In the last 5 years, over 6,000 scientific papers were published on species distribution modeling. These methods attempt to predict where species occur today and where they may move in the face of climate change. Understanding the power as well as the limitations of these methods is essential for informed conservation decision making. Using data from three years of research in the Mojave and Sonoran deserts, I share conclusions about the accuracy of models as typically applied in conservation. For our focal species, standard distribution modeling methods poorly predicted unknown occurrences, limiting our ability to predict how these individual species will respond to climate change. This work highlights that even in well-surveyed areas like southern California, on-the-ground surveys by experienced botanists are necessary to accurately describe and understand rare plant distributions. Nonetheless, approaches that look for patterns across a large number of species, or that are consistent among different modeling methods, are useful tools to identify likely responses to climate change or groups that may be at particular risk. Awareness of the limitations of distribution models is a reminder that these models should supplement, not replace, decisions based on field data on rare plant distributions.

2:30-3:00 pm **BGCI's PlantSearch database: existing and future applications**

Abby Hird Program Director for Botanic Gardens Conservation International-U.S.

BGCI's PlantSearch database is the only global database of plants, seeds, and tissues in living botanical collections. BGCI works with collection managers of public and private gardens, and seed banks to update their collection information on an annual basis. In the process, PlantSearch provides collection holders with valuable information such as global threat status, a names check, the number of collections reported worldwide per taxon. Through its email request function, PlantSearch connects hundreds of researchers, conservationists, educators,

curators, horticulturists and students with over 1,000 living collections worldwide each year.

In recent years, BGCI has worked to increase PlantSearch data quantity, quality and accessibility. New developments include the incorporation of synonymy, dynamic links to conservation data, a data sharing agreement, and improved user access to PlantSearch data. Past, present, and future database functionality will be discussed, along with examples of current and future data applications that can guide conservation efforts at the regional and global levels.

3:00-3:30 pm Break

3:30-4:00 pm **Ecological Restoration and Intelligent Tinkering: Some Highlights from Southern California**

Arlee Montalvo Senior Plant Restoration Ecologist, Riverside-Corona Resource Conservation District (RCRCD).

Habitat preservation is essential for managing biodiversity across the landscape. However, in highly urbanized and disturbed regions, restoration of lost linkages and conserved lands is essential for minimizing loss of biodiversity. On the downside, our southern California region is in need of a lot of restoration activity. On the upside, we have abundant resources and opportunities for using science-based approaches to habitat restoration because our region has many scientists and restoration practitioners actively engaged in ecological restoration. While small experimental trials for scaling-up to large projects is not always possible, many of us do use a combination of ecological principles, results from other studies, and small trials to inform restoration plans in what has been called intelligent tinkering. Today I will show examples of how scientists and practitioners have come together to provide tools for providing appropriate native plant materials, plant palettes, planting methods and other restoration techniques to accomplish successful habitat restoration on various conserved or public lands. I am especially grateful to staff from the Irvine Ranch Conservancy and the US Forest Service for providing examples of work in progress.

4:00-4:45pm **When The Killing's Done, What Threats Remain For Channel Island Rare Plants?**

Kathryn McEachern Research Ecologist, U.S. Geological Survey, WERC-Channel Islands Field Station

For more than 150 years the northern California Channel Islands were used as ranches, converting native scrublands to widespread annual grasslands and barrens. Habitat destruction led to rare plant decline; and ongoing grazing, rooting and trampling by non-native ranch animals was an overwhelming threat that kept recovery at bay. These animals were removed from most of the northern islands over the past several decades. Now that the killing is done the plants finally have a chance at population increase. What threats remain? Mapping, demographic monitoring and research experiments show a range of plant responses to release from direct effects of herbivory. Some taxa appear to be spreading, while others are hindered by the lingering effects of extremely small population size and isolation, habitat alteration, disrupted ecosystem processes, and climate change. Identifying which threats still present roadblocks allows us to tailor recovery actions for individual species or suites of species.

4:45-5:00pm Closing Comments by Naomi Fraga

Evening Events Continue at Rancho Santa Ana Botanic Garden

5:00-7:00pm **Poster Session and Mixer** featuring music by **Sage Against the Machine** (Antonio Sanchez (Nursery Production Manager), Evan Meyer (Seed Program Manager), and Rico Ramirez (Conservation Intern) from Rancho Santa Ana Botanic Garden)

6:00 - 9:00 pm **Banquet** with Keynote Dinner Speaker: **Dan Gluesenkamp** Executive Director of the California Native Plant Society