



Southern California Botanists

33rd Annual Symposium

Borderless Botany: Current Border Issues in Southern California

Saturday, October 20, 2007

The Ruby Gerontology Center California State University, Fullerton

Schedule:

9:00am—Introductory Comments

9:15am—Richard Felger (University of Arizona Herbarium), *Borderlands of the Río Colorado delta—a flora and people on the move*

Stand on the left bank badlands of the Río Colorado delta and most of the time you see barren, dried cracked mud as far as the eye can see -from Sonora to Baja California. Look to the sea where tidal bores once sank ships and 10 m tides support uncharted mass meadows of the endemic saltgrass *Distichlis palmeri*-potentially one of the most important grain crops for the world. Go northward 60 to 100 km to the California/Arizona borderlands: You pass the Ciénega de Santa Clara, a re-constituted and endangered wastewater wetland-the largest wetland in the Sonoran Desert. Then mosaics of parched salt flats, impenetrable expanses of tamarisk, halophytic desertscrub, xeroriparian thickets, sparse desertscrub, abandoned farmlands and then rich green farmlands, endless irrigation canals leaking into new wetland floras, new towns, new cottonwood gallery forests, and borderland farms and villages swelling into mega-city air-conditioned sprawl and their high horticultural diversity. It's not the first time the delta has gone dry-what happened during the pre-historic 17-year intervals when the river flowed into the Salton Basin? What will happen if the tamarisk thickets are eliminated with biocontrol? What were the predicted 200 to 400 vascular plant species extirpated from the delta-borderlands since the Big Dams? Is there a flora anywhere else so dynamic and so endangered?

10:00am—Erin Fernandez (Mexico Program Coordinator, USFWS) *Bi-national Partnerships to Conserve and Recover Cross-Border Species - Opportunities and Challenges -A U.S. Fish and Wildlife Perspective*

Working bi-nationally to conserve shared species of mutual concern to Mexico and the U.S. presents unique conservation opportunities and challenges. Sharing knowledge and resources among academic institutions, NGOs, government agencies, and individuals from both sides of the border significantly enhances our ability to conserve species throughout their ranges, across political boundaries. Many mechanisms to achieve cross-border conservation exist or may be developed, such as formation of and/or participation in cross-border working groups to develop and implement bi-national conservation strategies. Though cross-border species often share similar threats and conservation needs, bi-

national conservation mechanisms must always take into consideration the political, legal, and social differences in each country. Challenges to cross-border conservation may arise from trying to understand and manage these differences. The focused and dedicated effort of concerned cross-border partners, however, can ultimately result in significant conservation of shared species.

10:30am—Break

10:45am— Steve Schoenig (CDFA; Substituting for Gina Darin) *Invasive Plants and Border Issues in Southern California*

California is occupied by over 1,200 species of naturalized, non-native plants. Of these, at least 200 have been identified as invasive. Fewer than ten percent of invasive plants are recognized as serious threats, but these few have dramatically altered California's landscape. Invasive weeds, are an incredible threat to biodiversity, second only to outright habitat destruction. Buffelgrass (*Pennisetum ciliare*), a landscape transformer, carries fire through non-fire-adapted communities and displaces native species in the Sonoran Desert of Mexico and Arizona. These bad actors are being intentionally and unintentionally introduced into California from neighboring states and countries. Prevention is the solution to the problems caused by invasive weeds, and with that, education and awareness. Early detection and rapid response activities catch new invaders, which do slip past the borders. The state and county agricultural departments have a strong track record in detecting and eradicating invasive plants that had begun to establish within the state. However, with reduced programs, California needs all botanists to help with early detection.

Thankfully, awareness is on the rise. Government officials and land managers from Canada, the USA, and Mexico convene every other year during the Weeds Across Borders conference to discuss weed management, regulatory issues, and concerns about weed dispersal throughout North America. Nationally, the USDA-APHIS is considering regulations to limit plant introductions into the United States based on assessing invasiveness potential. At the state level, the CDFG Border Stations are increasing weed detection efforts. As for the counties, the state legislature is again funding Weed Management Areas. And locally, nurseries are voluntarily pulling problem plants from their shelves. Weeds do not respect political or geographical boundaries. Therefore, we must build partnerships across borders to prevent shared problems caused by invasive plants.

11:15am— J. Mark Porter* and Linda M. Prince (Rancho Santa Ana Botanic Garden) *Cross-boarder conservation and systematics: a case study of Peirson's Milkvetch (Astragalus peirsonii, subsection Proriferi, section Inflati; Fabaceae)* *Astragalus peirsonii* has been an exceptionally controversial species, in terms of species conservation. Initially believed to occur only at the Algodones Dunes in Imperial County, and near Borrego Springs, in San Diego County, California, it was later reported from several locations near Salton Sea, in the Yuma Dunes, Yuma County, Arizona, and discovered in the Gran Desierto, Sonora. We investigate phylogenetic relationships and population genetics of Peirson's milkvetch. We show that *A. peirsonii* and *A. magdalenae* display greater evolutionary divergence than any other species pair of subsection *Proriferi*, section *Inflati*. This corresponds with divergence in seed size (a key trait of Peirson's milkvetch) between Mexican and U.S. populations. We examine the consequences of these new systematic conclusions of conservation issues.

12:00pm—Lunch

2:00pm—Scott Eliason (San Bernardino National Forest) *Plant Conservation Across Jurisdictional Boundaries - Good and Bad Examples from the San Bernardino Mountains*

Rare plants in the San Bernardino Mountains tend to be associated with narrowly distributed habitats. These habitats are narrow because the edaphic and hydrological conditions that define them are also narrowly distributed. Examples from the San Bernardino Mountains include pebble plains, mountain meadows, and carbonate habitats; each of which contain multiple endemic rare plants. Despite such narrow distributions, all of these habitats cross jurisdictional boundaries to an extent that no single entity can provide all conservation and management needs. Conservation efforts for these species and habitats over the past 20 years have taken multi-jurisdictional approaches, but with mixed success.

2:40pm—Michael Connolly Miskwish (Councilman, Campo Kumeyaay Nation) *Conflicting jurisdictions and the effects of groundwater storage enhancement in the Campo Kumeyaay Nation*

The Campo Kumeyaay Nation is one of twelve Kumeyaay nations and one of eighteen Indian Reservations in San Diego County. Tribal lands represent a significant portion of the undeveloped lands of the County. San Diego County is also home to more endangered species than any other county in the United States. Coupled with the increase in population of the last fifty years, the potential for transboundary conflict has increased dramatically.

For the people of the Campo Indian Reservation, development has been accompanied by broad efforts to improve wetland/riparian habitats. The multiple

benefits of reasoned approaches to these habitats are increases in the availability of plants for traditional use, increases in the storage of groundwater and the increase in wetland habitat for areas under control of the tribe.

This presentation will discuss the basic history of the Kumeyaay and the evolution of tribal jurisdictional authority in the United States. It will discuss the fundamentals of groundwater quantification and water quality in the southeast region of San Diego County using both County methodology and Campo's empirical data. There will be discussion of the implementation of Campo's stratagem in the Diabold Creek drainage and other parts of the Reservation.

The presentation will discuss conflicts with existing State and County groundwater policies, and with water usage by individuals, agriculture and water companies. It will cover the long term effects of global warming on water supply and the industrialization of the Tecate region.

In conclusion, several recommendations for a broader strategy will be brought forward along with a summary of current efforts of the Campo people to work for mutually acceptable programs through local, national and international forums.

3:15—Break

3:30pm—Jon Rebman (San Diego Natural History Museum) *Plant Diversity and Collection Efforts along the California/Baja California Border*

The region along the California/Baja California border is one of the most diverse and threatened areas in North America. This portion of the USA/Mexico international border ranges from maritime Pacific coast to rugged peninsular mountains to dry, hot Sonoran Desert, and harbors a wealth of plant diversity in greatly differing vegetation types. The region is also home to more than six million people and their dramatic impacts and influences on the environment along with a continued population growth are completely changing the natural landscape.

Plant collection activities in this region date back to the 1870s, but there remains a lack of reliable botanical information on species distributions and extant populations from which to make good conservation decisions. Current floristic knowledge is especially difficult to obtain for those rarer plant species that are distributed near or across the international border because private lands with locked gates abound and regulatory procedures and statuses are different between the USA and Mexico.

The ongoing San Diego County Plant Atlas project and a future binational, multidisciplinary natural history expedition to the region hope to improve our botanical knowledge of this border's rich and threatened flora.

4:15pm—Closing Comments

Poster Session Abstracts

Using Herbarium Specimens to Assess Climate Change in San Diego—Layla Arne Hains and Dr. Mary Ann Hawke (Botany Department- San Diego Natural History Museum)

The San Diego County Plant Atlas project (www.sdplantatlas.org) is creating a scientific inventory of plant specimens to document the county's floristic diversity and establish a baseline against which changes in this region's plant life can be measured in the future. Created in 2003 by the San Diego Natural History Museum, the project provides accurate and detailed geographic information on the flora of the county. Over 540 trained "citizen scientist" volunteers have collected and submitted over 28,000 scientific plant specimens from across the county (including 160 new county records). Museum specimens can be used to document biological response to climate change, because they include data which enables changes in timing of plant reproduction or changes in geographic range or distribution to be examined. With plant specimens from San Diego stretching back to 1874, the Museum's botanical collection is an untapped source of information about the changes that have been occurring in the plant life of the county. The San Diego Foundation has awarded the Museum a research grant to investigate the responses of plants to climate change by compiling and analyzing plant specimen data collected from San Diego County since the 1800s. The project will analyze and map the data to track trends in San Diego's floristic resources over time, use the infrastructure of the Plant Atlas project to direct new collections in needed areas, and engage local scientists, managers, and citizens in framing the project within other local climate change research. The results will determine how future collecting and monitoring should be managed locally in order to maximize the scientific value of collections, and lead to a plan for tracking long-term changes in our local flora in the future.

Reproductive biology and ecology of the rare plant species *Hazardia orcuttii* (Orcutt's Goldenbush) Asteraceae—Julie A. Kirker, George L. Vourlitis and Kari Coler. California State University San Marcos

Hazardia orcuttii (A. Gray) E. Greene (Asteraceae) is a California state-threatened species and a candidate for federal listing. The only recorded extant population in the United States is in Encinitas, San Diego County, California. 17 populations had been historically voucher-documented between the years of 1920 and 1985, of which 11 were personally observed in the field in 2003 and 2004. Aspects of the reproductive biology of this scrub-chaparral species were investigated including shrub and floral reproductive phenology, germination requirements and viable seed production. Smaller shrubs (<35 cm) bloomed later in the season (started a couple of weeks later than larger shrubs) and did not produce seeds until 23 weeks after shrubs >35

cm tall. Germination testing included different temperature, photoperiod, and soil texture and moisture treatments. Successful germination occurred in all treatments, but there were significant differences in photoperiod, soil and soil moisture > variables. Fertile seed production for one year of the entire population > was low. More mature and larger shrubs (>= 55 cm tall) produced 6.5% > viable seeds, while smaller shrubs (<5 cm) produced 0% viable seeds. > These results suggest that while germination requirements of *H. orcuttii* were generally broad, reproductive output of this species was extremely limited.

Field Observations/Research at the Antelope Valley California Poppy Reserve—Mike Powell

Antelope Valley California Poppy Reserve

This poster presentation will highlight some of the results obtained to date during the on-going field observation/research effort begun in 2003 at the Antelope Valley California Poppy Reserve. The almost 1800 acre Poppy Reserve provides a unique opportunity to conduct long term in-situ research on the California Poppy, the State Flower, and the other plant and animal species making up the desert grassland ecosystem found on the Reserve. Being a State Parks facility, the largely undisturbed Reserve is permanently protected allowing long term research efforts with little probability of direct loss from subsequent development. Microclimate data (including rainfall, air and soil temperatures, and soil water content), recorded at a California Department of Water Resources (CDWR) weather station and seven mini-weather stations over the last four years will be presented. The seasonal accumulated rainfall recorded at the CDWR weather station will be shown for the past ten years. Both seasonal soil moisture profiles as well as peak soil moisture values correlated to rain storm precipitation amounts will be shown. The presentation will also include selected poppy life cycle data and poppy germination yields correlated with site specific rainfall. Tentative identification of the insect specimens collected from poppy blossoms in 2005 will be presented. This poster presentation will finally provide satellite photographs showing the localized variation in poppy color, a preliminary correlation between poppy fruit length and the number of contained seeds and a frequency profile of the stamen count for the Reserve's poppy blossoms. The presentation will conclude with a summary of planned future research efforts.

The Endangered Flora of Greater San Quintín, Baja California, Mexico—Sula Vanderplank (Rancho Santa Ana Botanic Garden)

Near the southern tip of the California Floristic Province lies Bahia de San Quintín, a diverse and relatively unspoiled region of the pacific coast, including one of the most pristine wetland environments in the world and 11 extinct volcanoes reaching 250 m. The vegetation is under extreme pressure from development and agricultural expansion. San Quintín itself is one of a series of rapidly expanding agricultural towns along the

transpeninsular highway in northwestern Baja California, currently home to an estimated population of 50,000 people. *Dudleya anthonyi* is endemic to the bay of San Quintín; and several other species endemic to the state of Baja California and the peninsula are found within the study site. This study aims to catalogue the floristic diversity of this region and record biodiversity for each of the four habitats within this area that were recently identified by the Nature Conservancy: The 'Matorral' is prevalent in the study site and dominated by *Aesculus parryi*, *Euphorbia misera*, *Ribes tortuosum* and *Rhus ovata*. The 'Salt Marshes' are characterized by an abundance of *Salicornia* with *Suaeda* species and maritime grasses which also occur around the Hypersaline Lagoons. The 'Dunes' exhibit relatively

pristine associations, including a dominant presence of *Abronia maritima*, with *Helianthus niveus* ssp. *niveus*, and *Isocoma menzezii*. The three Rivers and 'Riparian areas' maintain several weedy species, dominated by *Arundo donax*, *Ricinus communis*, *Salix* spp., and *Tamarix* spp. The range of each species will be vouchered with herbarium specimens to be deposited at BCMEX, SD and RSA. Seed accessions for as many species as possible will be deposited in the RSABG long-term seed storage facility. Progress to date includes the collection of more than 541 specimens, 22 seed bank accessions being deposited from the mainland, and 68 specimens from Isla San Martín.



Southern California Academy of Sciences

2008 ANNUAL MEETING

May 2-3, 2008

California State University, Dominguez Hills

The Southern California Academy of Sciences will hold its 2008 Annual Meeting on the campus of California State University, Dominguez Hills.

If you would like to organize a symposium for this meeting, or have suggestions for a symposium topic, please contact John Roberts at jroberts@csudh.edu; or Brad Blood at bblood@psomas.com.

Please join us at CSU-Dominguez Hills in 2008!