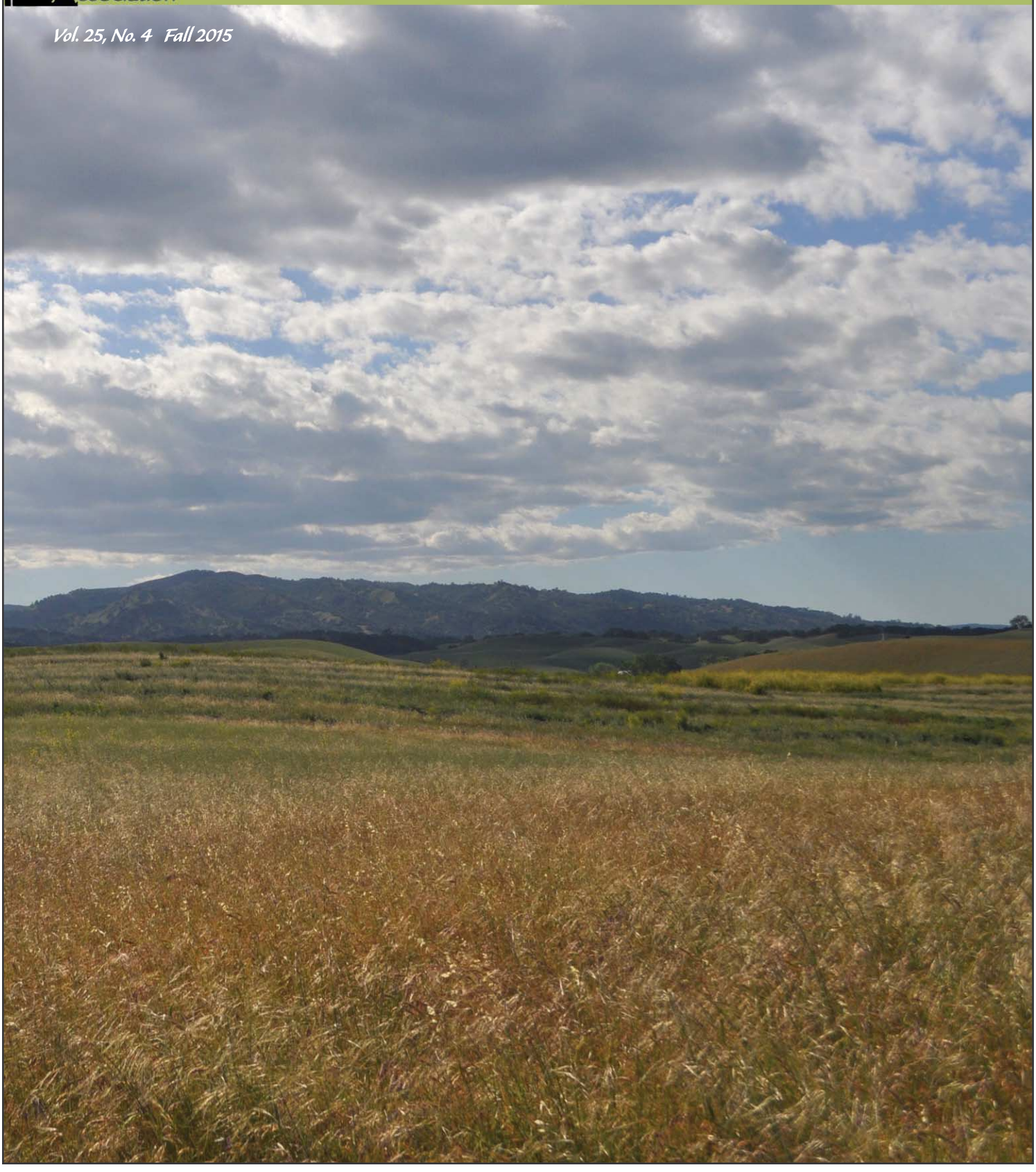
California Native Grasslands Association

GRASSLANDS

Published quarterly by the California Native Grasslands Association

Vol. 25, No. 4 Fall 2015



California Native Grasslands Association

Mission Statement

The mission of the California Native Grasslands Association is to promote, preserve, and restore the diversity of California's native grasses and grassland ecosystems through education, advocacy, research, and stewardship.

P.O. Box 72405, Davis, CA 95617
www.cnga.org
530.902.6009 admin@cnga.org

Grasslands is published quarterly by CNGA.
 ISSN No. 1540-6857
Layout editor: Julie St. John

From the President's Keyboard

Novel Ecosystems and the Culture of Habitat Restoration in California

by Jon O'Brien

I have been thinking lately about the idea of the "novel ecosystem." According to Hobbs et al., novel ecosystems are biomes with species combinations and abundances that have not occurred historically (2006).

I don't claim to have done extensive research on this concept, but I agree that it may be impossible to completely re-create or restore the habitat that existed historically in an area. Given the extent of human disturbance that has occurred over the last several centuries, it may be necessary for habitat restorationists to "settle" on plant communities that are not completely pure—especially in areas that have been so altered that we no longer really know what was historically present. And, in the face of climate change, we as restorationists will need to be more flexible with our habitat goals anyway.

My background is in habitat restoration on farm edges in the Sacramento Valley. One recent project is with the Yolo County Resource Conservation District on Cottonwood Slough, just south of Madison, California. This project involves setting back the slopes of the slough and planting a variety of native grasses, wildflowers, trees, and shrubs. Given that most of the sloughs in Yolo County are now largely devoid of vegetation and straightened, these types of set-back projects are a great way to restore native habitat to the Valley in a way that improves the hydrology (slows down and spreads out flood waters) and works within the agricultural landscape (i.e., minimal land is taken out of production).

Recently, a group of students from UC Davis came out to help with the project. One student asked me if, in effect, we were trying to restore what had actually grown in that specific area historically. My answer to the question was emphatically *no*! With all of the alterations to the landscape, including streambed straightening, it would be difficult to restore exactly what was in that spot historically. And, even if we did know what had grown there, such an ecosystem might not work in the current landscape.

However, we can work to restore *the function* of native habitats to areas such as these. That is to say, we can plant Sacramento Valley species native to these areas and then let succession proceed as it will. This brings me back to the novel ecosystem concept. These areas of the

***Grasslands* Submission Guidelines**

Send written submissions, as email attachments, to grasslands@cnga.org. All submissions are reviewed by the *Grasslands* Editorial Committee for suitability for publication. Contact the Editorial Committee Chair, Ingrid Morken, for formatting specifications: grasslands@cnga.org.

Written submissions include peer-reviewed research reports and non-refereed articles, such as progress reports, observations, field notes, interviews, book reviews, and opinions.

Also considered for publication are high-resolution color photographs. For each issue, the Editorial Committee votes on photos that will be featured on our full-color covers. Photos are selected to reflect the season of each issue. Send photo submissions, as email attachments, to Ingrid Morken at grasslands@cnga.org. Include a caption and credited photographer's name.

Submission deadlines for articles: **Winter 2016** — Nov 15, 2015 **Spring 2016** — Feb 15, 2016 **Summer 2016** — May 15, 2016 **Fall 2016** — Aug 15, 2016

President's Keyboard *continued*

Valley have been predominantly under weeds and crops for probably over 150 years. Therefore, it would be impossible to completely remove all weeds from the site. And even if we were able to do that for a part of one year, weed pressure from surrounding areas would be so high that weeds would come in again the next year.

I am not saying we should throw up our hands and give up, but it may be more realistic for restorationists to accept some level of non-natives in our projects since we, in effect, are restoring novel ecosystems. Having some structural diversity in the landscape with a mix of natives and weeds is better than nothing. This means expanding the plant communities that have been, by and large, removed from the area without necessarily eradicating the plants that have become naturalized over the past centuries. And to be clear, I am not proposing that we need to start planting non-native species in our plant-based restoration projects, only that we could potentially have a more diverse ecosystem that has the same function as historic California landscapes by not trying to eradicate every weed that blows in from a surrounding field. This is a slippery slope, I know, but certainly there is some middle ground between a pure California landscape from the past and a current monoculture of weeds on a field edge.

A final example from the Cottonwood Slough site: A lot of smilograss (*Stipa miliacea*) has been coming up this past year. Smilograss is a non-native perennial that is sometimes cultivated for livestock feed. My first instinct is to say "Oh no, smilograss! Has anyone got an herbicide wick?" But perhaps it is ok to have some smilograss in the site; it is a bunchgrass after all, and maybe it will add some understory diversity to the site once the native creeping wild rye (*Elymus triticoides*) gets going. I am not sure what we will do about the smilograss, but this may be an opportunity to be more open to allowing some non-native species to remain as part of a biodiverse restoration site.

References

Hobbs, R.J., S. Arico, J. Aronson, J.S. Baron, P. Bridgewater, V.A. Cramer, P.R. Epstein, J.J. Ewel, C.A. Klink, A.E. Lugo, D. Norton, D. Ojima, D.M. Richardson, E.W. Sanderson, F. Valladares, M. Vila, R. Zamora, and M. Zobel. 2006. "Novel ecosystems: Theoretical and management aspects of the new ecological world order." *Global Ecology and Biogeography*: 15:1–7.

Spring 2016 Workshops

California's New Front Yard: Creating a Low-Water Landscape
(to be offered in both Santa Cruz and Merced)

Pesticide Safety Training

9th Annual CNGA Field Day at Hedgerow Farms

Identifying and Appreciating the Native and Naturalized Grasses of California

Dates and locations for the Spring 2016 workshops are yet to be determined. CNGA will notify members of final details by Grass-blast emails. You can also keep an eye on our website for more information: **www.cnga.org**

In this issue

Figure 1. Small fescue in production for seed harvesting at Hedgerow Farms. *Photo: Hedgerow Farms*

SPECIES SPOTLIGHT: **Small Fescue (*Festuca microstachys*)**

by Andrew Rayburn, CNGA Board Member and Director of Science at River Partners

Showy wildflowers and perennial bunchgrasses are often the most prominent species in California grasslands and are commonly planted during grassland restoration efforts. However, annual grasses and forbs are also important components of grasslands and also have significant value for restoration. As you walk through your local grassland, a closer look between bunchgrass tussocks may reveal solitary stalks or tufts of a smaller grass with narrow inflorescences on which seeds may mature earlier in the season than any of the surrounding perennial grasses. In fact, at first glance, this grass may blend in with many of the nonnative annual grasses that now dominate many of our grassland communities.

Small fescue or three weeks fescue (*Festuca microstachys,* formerly *Vulpia microstachys*) is a cool season, annual grass native to California and the broader western U.S. There is still substantial uncertainty about the extent to which native annual grasses like small fescue occurred in historical California grasslands (Corbin et al. 2007). However, small fescue was likely a significant component of native grasslands, especially on drier soils (Howard 2006). Four co-occurring varieties of the species are recognized, based primarily on spikelet *indumentum* (pattern of fine hairs).

In present-day California, small fescue is typically common-to-dominant in valleys and low foothills, growing from 0–1,500 m in elevation, with a preference for open, often disturbed sites with thin or compacted soil (Heady 1977, Howard 2006). Small fescue is smaller than most perennial bunchgrass species, producing one to a clump of stems typically under 1 foot tall. Small fescue often co-occurs with the nonnative rattail fescue (*Festuca myuros*) and can be distinguished based on the length of the first glume; for *F. myuros*, the first glume is less than half as long as the second glume. Small fescue is a fast-growing, opportunistic species and responds well after fire and other disturbances (Harrison et al. 2003). Like many grasses, seed is primarily dispersed by wind (Albertson and Weaver 1944), although seed awns provide a means for dispersal by wildlife (Howard 2006).

Small fescue is almost exclusively *cleistogamous*—meaning it has flowers that self-fertilize without opening (Howard 2006). Small fescue has been studied as a model for the effects of the resulting extreme inbreeding on genetic structure. Interestingly, although populations have been found to have extremely low rates of outcrossing (less than 1%), significant genetic variation has been found in traits such as flowering time, height, and the rate at which tillers are produced (Kannenberg and Allard 1967). A follow-up study by Adams and Allard (1982) confirmed the high degree of selfing for small fescue but also

continued next page

Small Fescue *continued*

found evidence of occasional "bursts of outcrossing" that could generate significant genetic diversity. Interestingly, small fescue is often the dominant native grass on rocky, serpentine soils (Mooney et al. 1986), and there is evidence of phenotypic plasticity and localized adaptation to serpentine conditions at the seed germination stage (Jurjavcic et al. 2002). Small fescue has also been observed around vernal pools, which suggests additional local adaptation (Emily Allen, Hedgerow Farms, personal communication). Native seed suppliers have developed collections based on both inland valley and vernal pool sources (Fig. 1).

Small fescue is recommended for use in reclamation and emergency short-term erosion control while perennial plants establish (Howard 2006). For example, small fescue is a significant component of native seed mixes being explored for planting after many of the recent, large-scale fires this summer near Clear Lake and the newly designated Berryessa Snow Mountain National Monument. Emily Allen of Hedgerow Farms notes that "small fescue is frequently used in native erosion control mixes since it germinates and establishes quickly while acting as a nurse crop for slow-growing native species." More generally, small fescue is often included in diverse native grassland seed mixes in order to complement perennial grasses and forbs (Fig. 2). For example, bunchgrasses tend to have significant interspaces between tussocks after maturity. Small fescue can establish in these gaps, utilizing space and resources that might otherwise provide opportunities for noxious invasive weeds like medusahead (*Elymus caput-medusae*), barbed goatgrass (*Aegilops triuncialis*), or yellow starthistle (*Centaurea solstitialis*). In rangeland settings, small fescue readily reseeds and can provide nutritious, palatable forage at early growth stages (Sampson et al. 1951).

The next time you are exploring a grassland in late spring, keep an eye out for seedheads of small fescue peaking out between larger clumps of perennial grasses and flowers. Native annual grass species are important components of California grasslands and valuable additions in seed mixes for restoration.

Figure 2. Small fescue (*Festuca microstachys*) planted as part of a diverse seed mix for an ongoing rangeland restoration project in Sonoma County. *Photo: Jeff Wilcox*

References

Adams, W.T., and R.W. Allard. 1982. "Mating system variation in *Festuca microstachys*." *Evolution* 36:591–595.

Albertson, F.W., and J.E. Weaver. 1944. "Nature and degree of recovery of grassland from the great drought of 1933 to 1940." *Ecological Monographs* 14(4):393–479.

Corbin, J.D., A.R. Dyer, and E.W. Seabloom. 2007. "Competition Interactions." Pp. 156–168 in *California Grasslands: Ecology and Management*, M.R. Stromberg, J.D. Corbin, and C.M. D'Antonio, eds. Berkeley: University of California Press.

Harrison, S., B.D. Inouye, and H.D. Safford. 2003. "Ecological heterogeneity in the effects of grazing and fire on grassland diversity." *Conservation Biology* 17(3):837–845.

Heady, H.F. 1977. "Valley grassland." Pp. 491–514 in *Terrestrial Vegetation of California*, M.G. Barbour and J. Major, eds. New York: John Wiley and Sons.

Howard, J.L. 2006. "*Vulpia microstachys*." In: Fire Effects Information System (Online). U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: **http://www.fs.fed.us/database/feis/** (2015, September 1).

Jurjavcic, N.L., S. Harrison, and A.T. Wolf. 2002. "Abiotic stress, competition, and the distribution of the native annual grass *Vulpia microstachys* in a mosaic environment." *Oecologia* 130:555–562.

Kannenberg, L.W., and R.W. Allard. 1967. "Population studies in predominantly self-pollinated species. VIII. Genetic variability in the *Festuca microstachys* complex." *Evolution* 21:227–240.

Mooney, H.A., R.J. Hobbs, J. Gorham, and K. Williams. 1986. "Biomass accumulation and resource utilization in co-occurring grassland annuals." *Oecologia* 70:555–558.

Sampson, A.W., A. Chase, and D.W. Hedrick. 1951. "California grasslands and range forage grasses." Bull. 724. Berkeley, Calif.: UC College of Agriculture, California Agricultural Experiment Station. 125 pp.

Figure 1. (right) Vernal pools at Prairie City SVRA in the wet phase. *Figure 2.* (above) Prescribed burn taking place May 2013, Prairie City SVRA. *Photos: Max Heitner*

Prescribed Fire in the Vernal Pool Grasslands of Prairie City State Vehicular Recreation Area

by Max J. Heitner[1], Environmental Scientist, California State Parks, max.heitner@parks.ca.gov

Introduction

California State Parks manages 279 park units throughout California, ranging from State Historic Parks to State Beaches to State Recreation Areas. Twenty miles east of Sacramento, one will find Prairie City State Vehicular Recreation Area (SVRA), a park unit designed to balance off-highway vehicle (OHV) recreation with cultural and natural resource management.

Within the boundaries of Prairie City SVRA are almost 200 acres of vernal pool grasslands, a California prairie ecosystem that includes both upland grasslands and the seasonal wetland vernal pools, which are home to many native species of flora and fauna (Fig. 1). Within this Vernal Pool Management Area, State Parks exclude OHV recreation and provide educational opportunities such as the annual springtime Vernal Pool Tour led by State Park scientists.

In 2013, a prescribed burn was implemented on 176 acres of vernal pool grasslands (Fig. 2). The burn was managed as a partnership between State Parks and California Department of Forestry and Fire Protection (Cal-Fire). The main objective of the burn was to reduce invasive grasses, increase native plant diversity, and restore the structural integrity and hydrologic cycle of the vernal pools.

Methods

To track any changes in vegetative composition following the prescribed burn, data were collected in April 2011 and April 2014 (Fig. 3). Data collection methodology followed the California Native Plant Society's relevé protocol, which can be found at: **http://www.cnps.org/cnps/vegetation/pdf/cnps_releve_protocol_20070823.pdf.**

continued next page

[1]Working in the Twin Cities District of California State Parks, Max Heitner manages the balance of recreation and resource management on public lands.

Prescribed Fire *continued*

Twenty-two plots were assessed within the 176-acre burn site. Eight were selected in upland grassland areas, and 14 were selected in vernal pools. Data were collected on vegetative cover (percent of total) for each species identified within a plot.

Several ways to quantify plant species diversity exist. Analysis for this study focused on all elements of the Shannon-Wiener diversity index (H), including species richness (S) and species evenness (E). Species richness refers to the number of species found in each plot. The Shannon-Wiener diversity index expands on species richness by also accounting for the relative abundance or evenness (E) of the different species in a survey plot. Species evenness (E) is the relative abundance of each species and is calculated as E = H/ln(S), with values falling between 0 and 1.

The Shannon-Wiener index is calculated as $H = -\text{å } P_i(\ln P_i)$, where P_i stands for the proportion (i.e., relative abundance) of each species as compared to the total value of all species. The value of the Shannon-Wiener index increases both when the number of species (S) increases and when species evenness (E) increases. The value of the index is maximized when all species are equally abundant, and the index and can range from 0 to 4.6.

Table 1. Statistical Analysis of Vegetation Composition before and after Burn

	Pre-Burn (2011)	Post-Burn (2014)
N (Number of Plots)	22	22
Mean Species Richness	14.77	15.14
95% Mean Species Richness Confidence Interval	(11.03, 18.51)	(12.15, 18.13)
Mean Species Diversity	1.49	1.94
95% Mean Species Diversity Confidence Interval	(1.27, 1.71)	(1.77, 2.11)
Mean Species Evenness	0.58	0.74
95% Mean Species Evenness Confidence Interval	(0.52, 0.64)	(0.71, 0.77)

Results and Discussion

Significance testing was determined using the mean results at 95% confidence. Calculations were completed using Microsoft Excel functions. Mean species richness did not significantly change following the prescribed burn; however, both mean species diversity and mean species evenness increased significantly (Table 1). The increase in evenness could mean that the burn helped somewhat to relieve the vernal pool grasslands from domineering

continued page 8

Figure 3. Quadrat surveying of a vernal pool point in 2014. *Photo: Max Heitner*

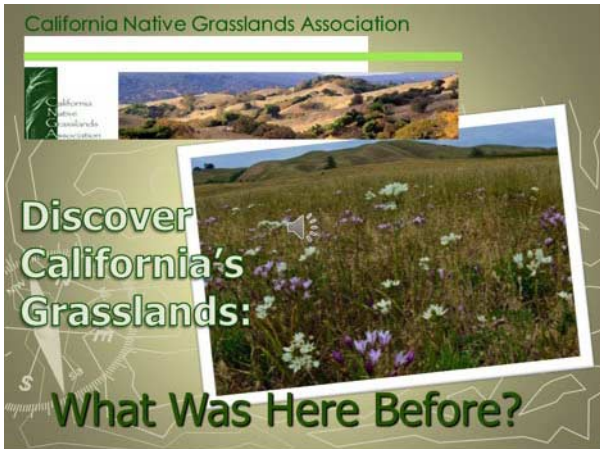
CNGA Grasslands Video and Curriculum Released

by Jim Hanson, CNGA Board Member

CNGA recently released a science education video and accompanying curriculum materials entitled *Discover California's Grasslands: What Was Here Before?* Produced by CNGA Board Member and Ecologist Diana Jeffery, the goal of the video is to introduce young people to the rich plant and animal life of California grasslands. Jeffery developed a PowerPoint presentation and then expanded it into a 17-minute video using a moving slide format. A natural soundscape underlies the story so the viewer experiences the sounds one might hear in a grassland, including wind, rain, and animal sounds.

Jeffrey says she hopes the video will "give children of all ages a sense of the ecological complexity and social benefits that science is documenting in our California grasslands."

The video and curriculum materials are available on the CNGA website (**www.cnga.org**) under the "Curriculum" header or by searching YouTube under "California Native Grasslands Association: What Was Here Before?" Also



available on the CNGA website are supplemental curriculum materials for teachers to use to develop the lessons on grasslands further.

Support for the video production came from the following: a $3,500 TIDES Foundation grant, donations to a CNGA "Seeding the Future Fund," and from many contributing photographers.

Diana Jeffery has also been instrumental in developing content for the Sonoma Marin Coastal Grasslands Working Group website, *Welcome to California's Coastal Prairies* (**http://www.sonoma.edu/cei/prairie/**).

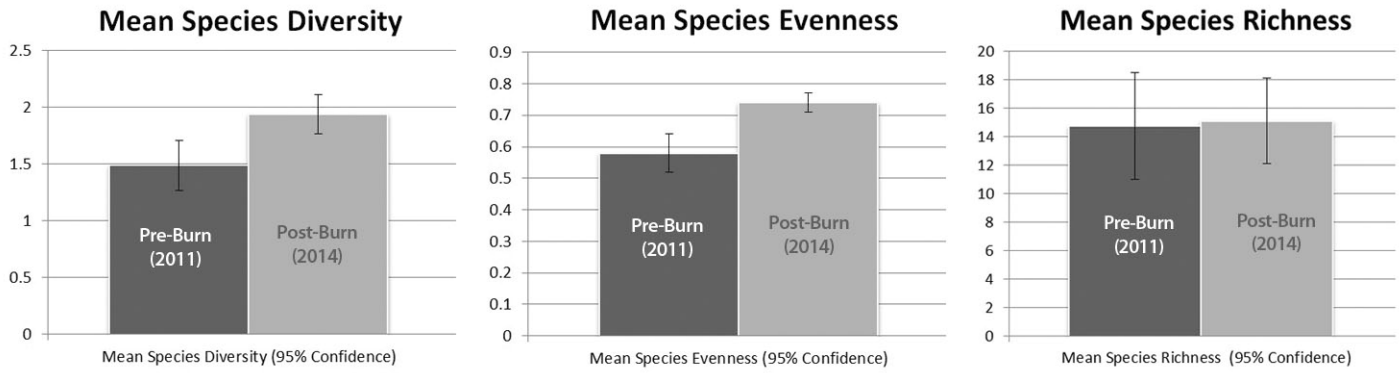


Figure 4. Graphs displaying Mean Species Diversity, Evenness and Richness.

Prescribed Fire *continued from page 6*

invasive grasses. It could have also been indicative of an increase in native species, but that does not seem to be the case. By accumulating all species surveyed from all plots, we found that the percentage of native species actually declined after the prescribed burn from 68.67% to 58.14% (Table 2; Fig. 4).

Table 2. Native Species Percentage before and after Burn

	Pre-Burn (2011)	Post-Burn (2014)
Total Species Surveyed	83	86
Native Species	57	50
Native Species Percentage	68.67%	58.14%

Monitoring of the prescribed burn indicates some goals met and others not. Native species richness has not increased; however the dominance of invasive species has declined, and the survey plots are indicating a more even distribution of plant species, both native and not native to the grasslands of California (Fig. 5). These results are promising, and monitoring will continue at Prairie City SVRA to help determine a proper frequency for further prescribed burns or whether management should be shifted to another method for invasive species control in the vernal pool grasslands.

Figure 5. Vernal pool plant species *Lasthenia fremontii* and *Downingia bicornuta* seen during the 2014 Annual Vernal Pool Tour at Prairie City SVRA. *Photo: Max Heitner*

Acknowledgments

Sarah Cumber-Lose, Environmental Scientist, California Department of Fish and Wildlife

Ramona Robison, Rare Plant Program Manager, California Native Plant Society

VISITING CALIFORNIA'S GRASSLANDS:

Ridgecrest Boulevard, Mount Tamalpais, Marin County

by Andrea Williams, Vegetation Ecologist, Marin Municipal Water District

Mount Tamalpais dominates the horizon of Marin County, and hundreds of acres of grasslands wrap its southwest flank. Offering views of the Pacific Ocean on one side and the reservoirs holding Marin County's drinking water on the other, the scenery along this section of California's Coastal Trail certainly grabs one's attention (Fig. 1). The Ridgecrest grasslands encompass lands managed by California State Parks, Marin Municipal Water District (MMWD), and the National Park Service and allow for hiking and enjoyment of their natural beauty (Fig. 2).

The vastness of these grasslands means you will find a plethora of species. Grassland-dependent animals such as western meadowlarks and grasshopper sparrows can often be seen, and hawks and coyotes are reliably found. Badgers and rattlesnakes, while not often visible, definitely patrol the slopes. The plant life is even more rich, dominated by our state flower, California poppy (*Eschscholzia californica*), and our state grass, purple needlegrass (*Stipa pulchra,* formerly *Nassella pulchra*). At least three species of lupine (*Lupinus nanus, L. bicolor,* and *L. albifrons*), western thistle (*Cirsium occidentale*), and bracken fern (*Pteridium aquilinum*) round out the showy common forbs. While walking through these grasslands, each section has its subtleties to appreciate.

The coastal prairie along Ridgecrest Boulevard is most easily accessed from Pantoll Road off Panoramic Highway; at the top of Pantoll Road is Ridgecrest Boulevard and the Rock Spring parking lot. Rock Spring is, in itself, a fine example of serpentine grasslands, wet meadow, and serpentine barrens. There, one may find rare plants such as Brewer's milkvetch (*Astragalus breweri*), Mt. Tamalpais bristly jewelflower (*Streptanthus glandulosus* ssp. *pulchellus*), marsh zigadene (*Toxicoscordion fontanum*), and harlequin lotus (*Hosackia gracilis*). Spring is prime time to see golden California oniongrass (*Melica californica*) and native onions (*Allium falcifolium* and *A. amplectens*) dotting the rocks and possibly even anise swallowtail butterflies laying eggs on native hogweeds (*Lomatium* spp.).

Heading west, more common "California annual grasslands" dominate the ocean side of the road, but pockets of red fescue (*Festuca rubra*) grassland tuck into drainages on the "lake" side, with late-flowering mugwort (*Artemisia douglasiana*) and goldenrod (*Solidago velutina* ssp. *californica*). For the observant, over a dozen species of clover can be seen, along with sweet surprises, such as fringepod (*Thysanocarpus curvipes*) and hairy wood sorrel (*Oxalis pilosa*). Visitors may

continued next page

Figure 1. Ridgecrest Boulevard offers sweeping views. *Photo: Marin Municipal Water District*

Figure 2. Coastal breezes sculpt trees along the trail. *Photo: Marin Municipal Water District*

Ridgecrest Boulevard *continued*

also notice "invading" natives such as coyote brush (*Baccharis pilularis* ssp. *consanguinea*) and Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*); years of fire suppression and lack of grazing have allowed these woody plants to increase (Fig. 3), converting coastal prairie to coastal scrub and conifer forest. In some areas, the woody species are being cut back to ensure the grasslands and all the plants and animals that depend on them have room to thrive.

Figure 3. The march of the Douglas-fir: left, 1984; right, 2014. *Photos: Marin County*

GETTING TO KNOW GRASSLAND RESEARCHERS: **Jeff Wilcox**[1]

by Andrew Rayburn, CNGA Board Member and Director of Science at River Partners

What is your study system? What are your primary research goals?

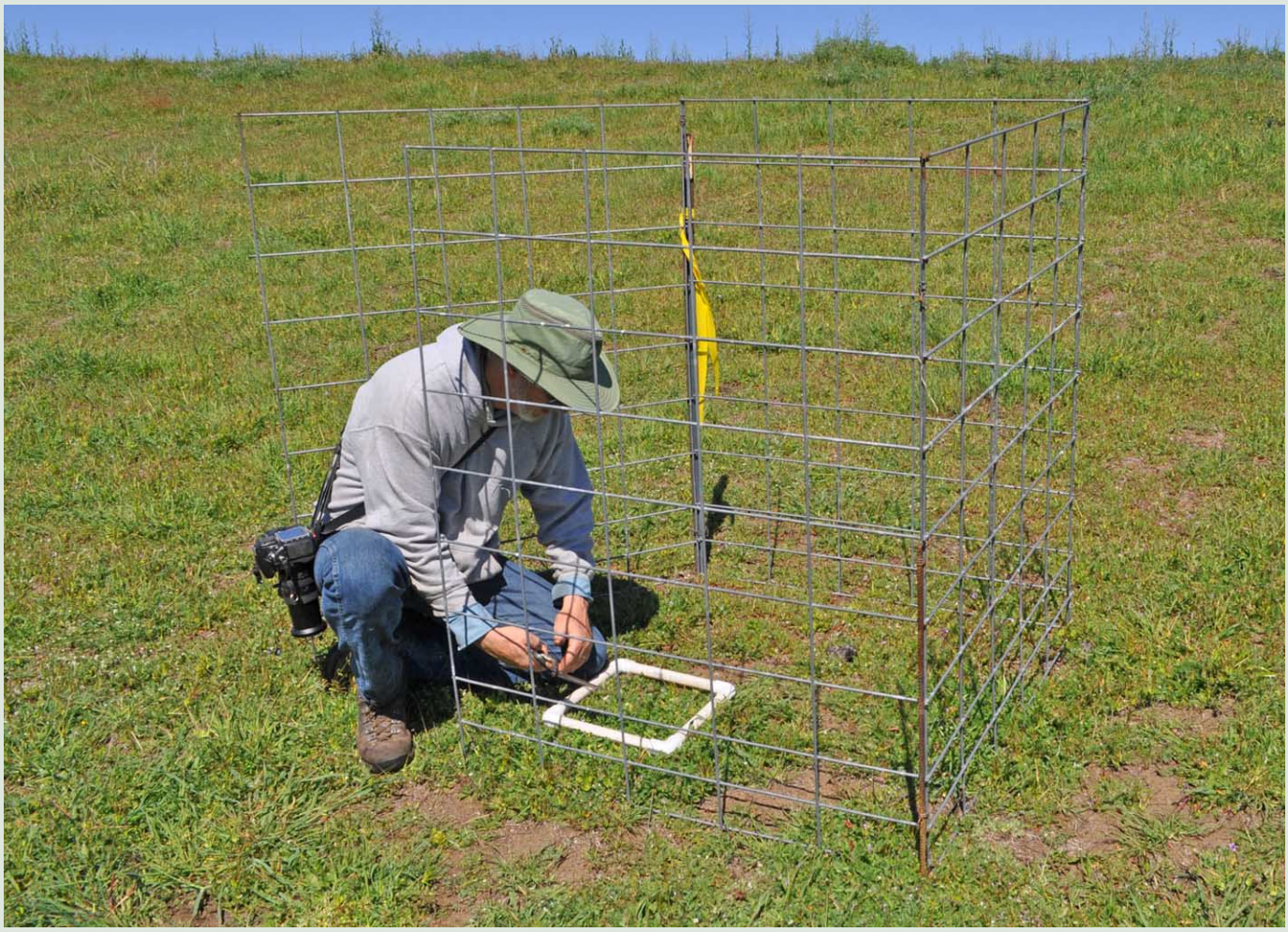
The system we study is the 632-acre Mitsui Ranch on top of Sonoma Mountain, just east of Petaluma, located in the inner Coast Range of northern California. Our mission here is to reverse soil loss, improve wildlife habitat, and restore grassland ecosystem functions that have been diminished or lost over the past 150 years due primarily to traditional grazing practices. To that end, we are collaborating with other researchers to re-introduce native grasses, mostly perennials, that still exist in isolated places here on the ranch.

We are using prescribed fire to "clean the slate" and greatly reduce undesirable grasses like medusahead (*Elymus caput-medusae*), followed by native grass planting and a program of targeted grazing. Well-timed grazing, followed by sufficient rest, should give native perennial grasses a better advantage from which to compete with ever-present invasive alien annual grasses.

Key to this management regime is monitoring how a grassland ecosystem that is transitioning back to native perennials functions, and that is the crux of our research program. Our goal is to increase ecosystem function while also increasing forage quality for cattle because the process is not widely sustainable unless grazers can profit from these activities.

continued next page

[1]Jeff Wilcox is Managing Ecologist at Sonoma Mountain Ranch Preservation Foundation (SMRPF). He has been involved in grasslands research for 16 years.



Jeff Wilcox sampling forage quality in a grazing exclosure in 2015 at Mitsui Ranch. *Photo: Andrew Rayburn*

Jeff Wilcox *continued*

Who is your audience?

First and foremost our audience is the ranching community, but it also includes open space districts, state and federal agencies, and land trusts. We are focused on finding affordable methods for ranchers to build a more functional and profitable rangeland ecosystem. Our founder, Bonnie Mitsui, felt that if ranching continued to become a less prosperous endeavor, grasslands would become vineyards and houses, and most of California's iconic rangeland ecosystems would eventually disappear.

Who has inspired you, including your mentors?

I was initially inspired by an exhibit in the science gallery at the Oakland Museum of California. The exhibitors had isolated a single California oatgrass (*Danthonia californica*), then carefully washed the soil out of the roots. Once dry, the plant was suspended on a disk of clear acrylic, allowing the entire plant, above and below the soil surface, to be seen. The roots were over 6 feet long. I was stunned by what we cannot see and all that must be going on under ground.

My mentors are too numerous to list here but my research interest in grasslands began with my friend, Oren Pollack. Conversations with Grey Hayes, Mike Miller, Michelle Cooper, Richard King, Kent Reeves, Andrew Rayburn, and our grazers from the Sonoma Mountain Institute, including Byron Palmer, Nate Chisolm, and Jeremiah Stent, have inspired me greatly and continue to do so.

How has or will your research promote the mission of CNGA "to promote, preserve, and restore the diversity of California's native grasses and grassland ecosystems through education, advocacy, research, and stewardship"?

Restoring native grassland diversity is the major component of our research and restoration efforts. We believe that native grasses are inherently better than nonnative species at building soil and restoring ecosystem function because they evolved here over millennia with grazing pressure from native wildlife species. As we continue to test our theories, we will publish results and promulgate methods because our purpose is to show that we can build more diverse, resilient, and profitable rangelands so that ranching and native grassland species can persist together.

Why do you love grasslands?

Grasslands are not a drive-by landscape. Unless you get out in them and observe, you will never understand how diverse they are and how much is going on above and below the soil surface. From microbes to vertebrates, there is a big reward when you take the time to explore. That's what I love—the reward of finding another mystery every time I look.

Call for Member Voting:
CNGA Board Election for 2016

Election time for the 2016 Board of Directors is here. Like last year in an effort to save paper and mailing costs, CNGA will conduct an **online election**. Voting is open from December 1 to December 20. When the polls open for this year's election, go to **www.cnga.org**, sign in as a member, and click on Election 2016.

On December 1 all members will receive an email with 1) directions for creating your account if you have not done so already, and 2) access to election information and the ballot.

If you have any questions or concerns, please email admin@cnga.org or call 530.902.6009.

CNGA's Bunchgrass Circle

A Special *Thank You* to our Bunchgrass Circle Members! Your support for CNGA is much appreciated.

As a nonprofit organization, CNGA depends on the generous support of our Corporate and Associate members. Ads throughout the issue showcase levels of Corporate membership; Associate members ($125) are listed below. Visit www.cnga.org for more information on joining at the Corporate or Associate level.

Corporate Members

Muhlenbergia rigens

Hedgerow Farms

S & S Seeds

Stipa pulchra

Delta Bluegrass Company

Pacific Coast Seed

Restoration Resources

Security Seed Services

Poa secunda

All American Hay & Grain

Dow AgroSciences

Ecological Concerns Inc

Hanford Applied Restoration & Conservation

Sacramento Area Flood Control Agency

Sun City Lincoln Hills Community Association

Suncrest Nurseries

WRA Inc

Associate Members

Cachuma Resource Conservation District
Carducci Associates Inc
City of Davis
CNPS, Los Angeles Chapter
Contra Costa Water District
County of Santa Clara Parks & Recreation
East Bay Regional Park District
Integrated Environmental Restoration Services Inc
Larner Seed Company
McConnell Foundation
Mission Livestock Management
New Irvine Ranch Conservancy
Olofson Environmental Inc
Orinda Horsemen's Association
Peninsula Open Space Trust
Pure Live Seed LLC
Putah Creek Council
Ransom Seed Laboratory
Restoration Design Group
Roche + Roche Landscape Architecture
Sacramento Regional County Sanitation District
San Luis National Wildlife Refuge
Saxon Holt Photography
Sequoia Riverlands Trust
Solano County Water Agency
Sonoma County Ag Preservation & Open Space District
Sonoma Mountain Institute
Sonoma Mountain Ranch Preservation Foundation
Stork Peterkin International Foundation
Truax Company Inc
Watershed Nursery
Westervelt Ecological Services
Yolo County Resource Conservation District
Zentner and Zentner

It's that time of year again!

Help us get a headstart on 2016: Renew your membership early!

2015 was an exciting year for CNGA: we received a grant, added new staff, and expanded our workshop offerings. Thank you for being there for us! **Your continued support will allow us to make 2016 our biggest workshop year yet! We have exciting plans.**

Use this form to renew, or go to www.cnga.org and renew online.

- - - - Detach and mail this form with check made out to CNGA. Send to CNGA, P.O. Box 72405, Davis, CA 95617 - - - -

Individual Membership

- ❒ **REGULAR:** $45/year
- ❒ **SUSTAINING:** $60/year
- ❒ **JOINT CNGA+SERCAL:** $80/year (save $10)
- ❒ **STUDENT:** $30/year *Please send photocopy of current ID.*
- ❒ **RETIRED:** $30/year
- ❒ **LIFE:** (one-time payment) $500

Corporate Membership and Benefits

All employees of a corporate member receive member pricing when registering for CNGA events. All membership benefits are good for 2016. All copies of *Grasslands* will be sent to the main contact at the organization.

Name _____

Title _____

Organization _____

Street _____

City _____

State _____ Zip _____

Phone _____

Fax _____

Email _____

Check one:	Membership Level	Annual Cost	Online (color) Ads w/link to member website		*Grasslands* (B&W) Ads (currently 4 issues/year)	*Grasslands* Subscriptions
❍	*Muhlenbergia rigens*	$1,000	At top of CNGA sponsor page	LARGE	B&W version of online ad	4
❍	*Stipa pulchra*	$500	Below *Muhlenbergia* listings	MEDIUM	B&W version of online ad	3
❍	*Poa secunda*	$250	Below *Stipa* listings	SMALL	B&W version of online ad	2
❍	Associate/Agency	$125	Text listing below *Poa* sponsors	NO AD	Text listing in *Grasslands*	1

If there is more than one Corporate member per level, the members will be listed alphabetically. Employee memberships include all the benefits of a personal membership and the organization determines the recipients of Grasslands *subscriptions. Organization may opt for fewer subscriptions.*

California Native Grasslands Association

P.O. Box 72405
Davis, CA 95617
www.CNGA.org

NON PROFIT ORG
U.S. POSTAGE
PAID
TUCSON, AZ
PERMIT NO. 3341

2016 Elections are coming up soon… Watch your email inbox for the link to vote.

Front cover: Purple needlegrass (*Stipa pulchra*) shines at a grassland restoration site near Hedgerow Farms, Yolo County. *Photo: Andrew Rayburn*

Back cover: Big squirrel-tail (*Elymus multisetus*) growing with ripgut brome (*Bromus diandrus*) at the Bitter Creek National Wildlife Refuge in Kern County. *Photo: Jennifer Buck-Diaz*