



California  
Native  
Grasslands  
Association

Vol. 22, No. 2 Spring 2012

# GRASSLANDS

*Published quarterly by the California Native Grasslands Association*





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 8327, Woodland, CA 95776

**www.cnga.org**

530.661.2280 admin@cnga.org

**CNGA Board of Directors**

*Officers*

- Jim Hanson, President
- Catherine Little, Vice-President
- Elise Tulloss, Secretary
- Zachary Principe, Treasurer

*At-Large Directors*

- |                       |                  |
|-----------------------|------------------|
| Daniel Blankenship    | Kathleen Kraft   |
| Mary Fahey            | JP Marié         |
| Andrew Fulks          | Ingrid Morken    |
| Erik Gantenbein       | Jon O'Brien      |
| Diana (Immel) Jeffery | <i>Alternate</i> |
| Richard King          | Chad Aakre       |

**Administrative Director**

Judy G-Scott

**Events Coordinator**

Liz Cieslak

For membership and other organization information contact CNGA Administrative Director via admin@cnga.org.

For program information related to workshops, symposia, and field trips, contact CNGA Events Coordinator via events@cnga.org

*Grasslands* is published quarterly by CNGA.

Layout editor: Julie St. John

ISSN No. 1540-6857



**From the President's Keyboard**

**Grasslands — What's in a word?**

*by Jim Hanson, President*

The more we find out about California's current grasslands, the more interesting and complex they become.

In-depth research on the composition of California's current grasslands over the last decade indicates that the invasion of naturalized annual and perennial grasses and forbs has resulted in very little extinction of native grassland taxa. "Native species remain rich in number, even if individually their cover is low. In some areas their cumulative cover is greater than that of the exotics" noted the authors of an article on grassland communities in *California Grasslands* (Keeler-Wolf et al. 2007). In another observation that may be relevant to native grassland restoration, co-author Ayzik Solomeshch presumes that "native species have not changed their ecological requirements since European-American contact,

*continued next page*

**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 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 grasslands@cnga.org. Include a caption and credited photographer's name.

**Submission deadlines for articles:**

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| <b>Summer 2012</b> — May 15, 2012 | <b>Winter 2013</b> — Nov 15, 2012 |
| <b>Fall 2012</b> — Aug 15, 2012   | <b>Spring 2013</b> — Feb 15, 2013 |

## In this issue

### President's Keyboard *continued*

meaning that if a native taxon was confined to a particular soil series prior to contact, it will still show that pattern of occurrence today." As an indicator of current grassland diversity, the article notes that 400 different grassland association types are estimated to be in California.

One of the classification terms still widely used in the research literature and in regulatory natural resource classifications is *non-native annual grassland*. Perhaps this term became a default descriptor because of the current widespread domination of California's grasslands by annual species.

At the winter 2012 CNGA board meeting in Davis, we invited Jennifer Buck-Diaz for an update on the California Native Plant Society (CNPS) "Grasslands Initiative." The CNPS Vegetation Program has been documenting and defining grassland associations that are being uncovered from surveys across the state. A slide that struck me was the aerial view of a several-square-mile section of the Carrizo Plain that had, up to now, been labeled as *non-native annual grassland*. However, a more fine-scale vegetation classification and mapping effort sponsored by the Bureau of Land Management revealed a rich delineation of wildflower/forb alliances along with a perennial grass alliance. "It is the over-emphasis on non-native annuals and the under-recognition of the native component that I am working on changing," noted Buck-Diaz.

*California Grasslands* (Stromberg et al. 2007) uses the general term *grassland* to apply to California's low-elevation herbaceous vegetation (they also list *prairie* as a possible synonym, which is one that I use interchangeably when it helps to draw a verbal picture).

There are good reasons to use appropriate generalized vegetation name(s), along with finer scale plant community names, with this still complex ecological system. The first reason is that classification makes a difference when you are trying to conserve it. Here at CNGA, we reference the grassland classification descriptions and rarity ratings in the new *Manual of California Vegetation* (Sawyer et al. 2009) when commenting on development proposals that affect rare native grass and forb communities. Certainly if a large solar development were to be announced for a site like the Carrizo Plain location noted above, it would help inform the public policy process if the landscape was mapped for the full range of *rare native grass and forb alliances* actually found there, versus simply *non-native annual grassland*.



<i>A California Treasury of Native Perennial Grasses, Part One</i>	3-5
<i>Online Resources for Coastal Prairie Education and Land Management</i>	6
<i>New Research on Seed Zones and Ecological Services of California Native Grasses</i>	7-8
<i>CNGA Spring &amp; Summer Workshops</i>	9-10
<i>Preservation Efforts Under Way for Rare Alkali Grassland-Vernal Pool Complex in Yolo County</i>	11-12
<i>Native Grassland Conservation Update</i>	12

The second reason is simply that words make a difference. They leave an image or impression of a landscape that either opens or closes consideration for conserving the plant diversity that may exist there.

Native grasses remain resilient in California's grassland ecosystems and among the various vegetation communities throughout the state. CNGA supports continued research, including continued funding of the CNPS Grasslands Initiative and others, to better understand and beneficially manage the rich diversity in our state's grasslands.



### References

- Keeler-Wolf, T., J. Evens, A. Solomeshch, V. Holland, and M. Barbour. 2007. "Community Classification and Nomenclature." In *California Grasslands*, M. Stromberg, J. Corbin, and C. D'Antonio, 21-34. Berkeley: UC Press.
- Sawyer, J., T. Keeler-Wolf, and J. Evens. 2009. *Manual of California Vegetation*, 2<sup>nd</sup> edition. Sacramento: CNPS Press.
- Stromberg, M., J. Corbin, and C. D'Antonio, eds. 2007. *California Grasslands*. Berkeley: UC Press.

A design/build landscape and general engineering contractor that specializes in wetland and wildlife habitat mitigation and restoration.

3888 Cincinnati Avenue, Rocklin, CA 95765  
Phone: 916 408 2990 Fax: 916 408 2999  
[www.restoration-resources.net](http://www.restoration-resources.net)

# A California Treasury of Native Perennial Grasses PART ONE

by Stephen W. Edwards, Botanic Garden Director, Regional Parks Botanic Garden, Berkeley

Reprinted with permission from the Rancho Santa Ana Botanic Garden Occasional Publications Number 1, Symposium Proceedings: Out of the Wild and into the Garden, 1, edited by Bart C. O'Brien et al. 1997, pp. 129-138.

California's great floristic diversity, reflecting a complex geologic history, is manifested in its remarkable number of native perennial grasses of horticultural merit. Because grasses can be difficult for beginners, many horticulturists have shied away from them, or clung to time-worn entities. That situation is changing rapidly. The nationwide interest in new ornamental grasses is growing fast in California. Horticulture will always be by nature an experimental field. This is uniquely true of the culture of California native plants, a grand experiment that is still young. But California grass cultivation is just in its infancy. It is a wide open field, and its newly christened devotees are still enthralled novices (may it always be so!).

There is no better way to learn a group of plants than to discover its members in context. The best part of native plant gardening is the field work, and the field memories evoked by species first encountered in our favorite wild places. Accordingly, this discussion of a selection of the most ornamental and useful California native grasses will begin and end in the field.

Our first encounter with grasses comes with the cries of gulls, the taste of salt, and a crisp wind off the surf. There are useful and interesting perennial Poaceae right down on the back-V beach, struggling to hold the freshest dunes. I am not referring to European Beach Grass, *Ammophila arenaria*, that grotesque English nightmare that has devoured most of our coast, reducing fabulous diversity to rank monotony. On dunes not yet swamped by that monster, from Monterey up to Alaska, our most attractive aboriginal native dune-binder persists. American Dunegrass, *Elymus mollis*, is typically a colony former with broad, bluish blades massed into hummocky mounds, pierced by stout, 4 to 6-ft culms bearing narrow, spikelike rye-grass panicles. This is a rhizomatous spreader, designed to penetrate moving sand and to "come up for air" after being deeply buried. It does well in the garden, but it should be placed where invasiveness will not be a problem. To spread vigorously it does not require sand.

Overlooking the surf, coastal headlands endure a constant beating from salt-laden winds. In this environment on the north coast, highly competitive, fast-growing exotic pests like Sweet Vernal Grass, *Anthoxanthum odoratum*, Velvet Grass, *Holcus lanatus*, and Australian Oatgrass, *Danthonia pilosa*, are kept at bay. As little as 50 ft inland from the verge of the bluff (except on headlands), if the soil is deep and livestock grazing has been eliminated, typically these exotics completely overwhelm (and nearly eliminate) native flora. The first 50 ft or so of salt-blasted bluff, relatively free of such competition,

supports a diversity of wildflowers and some superb native grasses. One of the best places in California to see how rich and beautiful these seabluff meadows can be is at Pt. Arena, Mendocino County. There the swards are dominated by Coastal Hairgrass, *Deschampsia cespitosa* ssp. *holciformis*.

This densely low-mounding species, usually with short culms that preserve the low profile, can be found on seabluffs from San Luis Obispo County to Alaska. In the Regional Parks Botanic Garden, Berkeley (RPBG), we use the bunches to make a framework for our flowery seabluff walk, providing interest in fall and winter when the wildflowers are not evident. The species has also been effective in controlling erosion on very steep slopes; but in all cases inland it needs occasional summer watering.

Nearly all of the grasses discussed here benefit from being "cleaned up" (managed) every one to five years. Especially with older bunches, or bunches that have been slightly drought stressed, there is a gradual buildup of *residue*, or dead remains of old blades and culms. This residue shades out and crowds out new growth struggling for light. We have found that burning a *Deschampsia cespitosa* ssp. *holciformis* bunch to a black stubble by dropping a match into it results the following wet season in a supremely green, thriving, residue-free plant. To consider our native grasses to be ultimately separate, or abstracted, from grazing animals and fire (as they are in gardens) is unreality. The marvelous megafauna of large browsing and grazing herbivores preserved at Rancho La Brea records the kind of milieu in which California grasslands evolved.

After ten thousand years ago the diverse megafauna was reduced to elk, deer and pronghorn; elk, which regularly grazed, were seen in historic times in herds numbering up to 2,000 animals (Wagner, F. H. 1989. Grazers, Past and Present. In: Huenneke, L. F. and H. Mooney, eds. Grassland Structure and Function, Netherlands, Kluwer.) Periodic fires and population peaks of hypsodont microtine rodents (meadow mice) were also important factors in residue control. There was clearly always at least sporadic residue reduction going on in our evolving grasslands. Poaculturists should bear this in mind.

After severe grazing (as distinguished from overgrazing), burning, mowing, or clipping, there is a lag time, during which the bunchgrass gradually recovers from the loss of photosynthetic tissue caused by defoliation. After that period, managed older bunches often can "overcompensate" by growing more fresh, new growth than appears on adjacent unmanaged bunches of comparable age (with their

*continued next page*



California oatgrass (*Danthonia californica*), Pepperwood Preserve near Santa Rosa. Photo: Jennifer Hogan

## A California Treasury *continued*

burdens of residue). Those who do not wish to employ such a drastic procedure as burning or severe clipping can clean out a bunch by cutting off old culms with pruning shears, and then, with a spring rake, tossing out most of the old, dead blades.

Growing with Coastal Hairgrass on wild seabluffs from Monterey County northward is a refuge from the far north, Alaska Reedgrass, *Calamagrostis nutkaensis*. Typically this Reedgrass is in mesic sites, or the north faces of headlands or coastal hills, or within the dripline of closed cone pine forest. Alaska Reedgrass is not recommended for southerly gardens. In the San Francisco Bay Area, however, it performs beautifully. It is a large bunchgrass that is also able to spread slowly by short rhizomes. Its broad blades give a lush appearance to the landscape, especially if the bunches are cut down every year or two to keep them a splendid deep green. Growing this handsome bunchgrass is a little like tending a displaced piece of Alaskan coastline.

Alaska Reedgrass has, on the Humboldt County coast, a spectacular congener recently introduced to the horticultural trade by Roger Raiche of the University of California Botanical Garden in Berkeley. Cape Mendocino Reedgrass, *Calamagrostis foliosa*, is very rare in the field; its extreme elegance is sufficient assurance that it will not remain rare in horticulture. *C. foliosa* is a medium-sized bunchgrass, on the order of 18 inches high by 2 ft wide when in bloom. It is most dramatic in late spring, when its dense panicles are light purple, but the tawny panicles of summer are held for months. Their contrast with the purple streaked blades is eminently satisfying. The species does best with some summer irrigation—perhaps once every two weeks if planted in full sun in Central California—but it does fine with only rare watering in partial shade.

Red Fescue, *Festuca rubra*, is a commonplace of lawn mixes. Yet a number of compelling wild selections hale from the north coast of California. ‘Molate Blue’ (a.k.a. ‘Molate,’ ‘Point Molate’) is a relatively tall glaucous form from Pt. Molate on San Francisco Bay. An unnamed

phase growing on seabluffs of Mendocino County—for example, at Pt. Arena and at Jughandle—is glaucous, blue bladed, quite short and dense. It maintains this habit far from sea winds. There are also interesting strains from high elevations. Red Fescue is a sod-former, making deep, soft, luxuriant carpets that can tone down the harshness of a perennial landscape that receives occasional summer water. The handsome gray selections should not be wasted in lawns. They should be saved for the finest perennial gardens.

Speaking of lush landscapes, there is one scene guaranteed to lure the grass enthusiast far from established trails. If you see a distant meadow that is “all hummocky,” most of the time upon close inspection it will turn out to be composed of bunchgrasses. Some of the most entrancing hummocky meadows of Northern California consist of a close relative of Red Fescue, namely Idaho Fescue, *Festuca idahoensis*. Idaho Fescue is a small bunchgrass with very fine blades in dense masses, giving a delicate fountainlike effect. The species is extremely diverse. There are populations with long glaucous blades and culms; or with tight glaucous bunches with abbreviated blades and shorter culms (as at Mt. Eddy, Siskiyou County); or large bunches with green blades and culms. Thickness of blades is variable. Some of the intermediate “grayish bluish green” (sometimes the color seems indescribable) can be striking. There are endless forms to choose from and, of course, varying cultural requirements. Some of the high elevation forms can be difficult unless grown on soils with “perfect” drainage. All populations possess some degree of drought tolerance.

Idaho Fescue occurs in remarkably varied environments, from near sea level to the alpine zone. There will be many new cultivars in the years to come. In the Bridge Creek National Wildlife Refuge in Northeastern Oregon, Idaho Fescue is the favorite forage of elk. I try to think of all the various forms of the grass in the RPBG in relation to migrating elk, and I manage them accordingly, with occasional clippings. Idaho Fescue opens our way inland, conducting the

*continued next page*

## A California Treasury *continued*

imagination to distant and mountainous terrains. Following are some outstanding ornamental grasses of Northern California's Outer Coast Ranges.

Serpentine Reed Grass, *Calamagrostis ophiditis*, is endemic to ultrabasic rocks from Marin to Mendocino County. It is a medium-sized bunchgrass (about the size of *Nassella pulchra*). Attractive but touchy, it belongs perhaps in the collector's garden.

California Oatgrass, *Danthonia californica* (including its var. *americana*, a more pilose version), is widespread below 8,000 ft. Particularly prominent in the Coast Ranges, among our native bunchgrasses it is perhaps the most tolerant of overgrazing (by definition a condition in which livestock are left too long on a given site, with the result that native plant biodiversity declines or is kept at a significantly depressed level). It develops very low forms in overgrazed areas. These stay low in the garden, whether "managed" or not. I have often wished to type-convert a lawn to *Danthonia californica*. The grass has voluminous roots and takes trampling well. Unfortunately it is slow to germinate, and amassing enough for a lawn requires an extended nursery preamble. California Oatgrass is easy to recognize because its spikelets vaguely resemble those of a ubiquitous exotic trash-grass: wild oats, *Avena* ssp.; and because its culms fall



*Festuca rubra*, Pt. Molate coastal prairie (Spring 1983). Photo: David Amme

outward intact, sometimes detaching with their spikelets still attached, in a radiating pattern around the bunch like the spokes of a wagon wheel.

Bunchgrasses typically desire full sun in their native ranges. The next three are unusual in that they either require or do best in some shade. Porcupine Grass, *Elymus californicus*, formerly *Hystrix californica* (*Hystrix* is the genus of the Old World porcupine), also known as Bottle Brush, is named for its inflorescence, which resembles a bottle brush made of porcupine quills! It is a large bunchgrass which also spreads by short rhizomes, as does Alaska Reed Grass. Its soft, lax blades are among the broadest (hence lush looking) possessed by any Californian grass. The tall, thick culms, surmounted by large, bristly inflorescences, contrast sharply with the foliage. Porcupine Grass grows in the shade of redwoods or other coastal forests from Santa Cruz to Sonoma County. It is easy to grow if provided with summer irrigation and a little shade, under which conditions it will readily seed itself around.

Vanilla Grass, *Hierochloa occidentalis*, is a lover of shady redwood or Douglas fir understory. It is a small, short-statured bunchgrass with broad blades seemingly too large for the size of the bunch, until one remembers that broad leaves for intercepting diffuse light are advantageous for forest floor taxa. Vanilla Grass is easy to grow and tolerates some literally vicious clay soils provided it receives its moisture and shade. The leaves, when crushed, give off a subtle sweet odor faintly reminiscent (with imagination) of vanilla—hence the name.

California Fescue, *Festuca californica*, is one of the state's most reliable and useful cultivated ornamental plants, beautiful in many garden settings, whether placed individually or covering whole hillsides. It is a large bunchgrass with narrow blades and tall culms topped by drooping panicles. There are many field localities where high quality blue gray variants can be found (e.g., Roger Raiche's beautiful 'Serpentine Blue'). The "old fashioned" green forms, too (and there are many gradations), are fantastically beautiful and elegant, much to be prized and commented upon in any landscape that can afford them suitable conditions. California Fescue can be used as a lower-stratum framework under open-canopied aging shrubs, under oaks, or to cover a slope quickly, and it is moderately drought tolerant. But to really get the best out of this spectacular showplant, it is usually necessary to provide light shade and occasional summer irrigation.



*To be continued next issue...*

**S&S SEEDS**

SEEDS FOR EROSION CONTROL, REVEGETATION & LANDSCAPE PROJECTS

PROMPT CUSTOMER SERVICE

EXTENSIVE INVENTORY OF HIGH QUALITY SEEDS

CALIFORNIA NATIVE GRASSES, SHRUBS & WILDFLOWERS

CUSTOM SEED DESIGNS AND MIXES

SITE SPECIFIC SEED COLLECTION & INCREASE

EROSION CONTROL SOLUTIONS & PRODUCTS

MYCORRHIZA, HUMATES & ORGANIC FERTILIZERS

CALIFORNIA NATIVE SOD VARIETALS

CARPINTERIA, CA.  
T: 805.684.0436 F: 805.684.2798  
INFO@SSSEEDS.COM  
WWW.SSSEEDS.COM

# Online Resources for Coastal Prairie Education and Land Management

by Kathleen Kraft, Project Coordinator, Coastal Prairie Enhancement Feasibility Study, [kkraft@sonic.net](mailto:kkraft@sonic.net)

Northern California's Coastal Prairies are the subject of a new website created by the Sonoma Marin Coastal Grasslands Working Group's education program: [www.sonoma.edu/preserves/prairie/index.shtml](http://www.sonoma.edu/preserves/prairie/index.shtml)

Designed to reach a diverse group of community members in the region, the website features printable sections divided into topics.

- ☼ The first section describes Coastal Prairie, its distribution and vegetation types, and includes individual sketches of selected plants and animals that inhabit grasslands.
- ☼ The second section discusses the pre-history and history of grasslands with a section on the evolution of the grassland biome, a timeline for the development of grasslands in California, and descriptions of now-extinct megafauna that once grazed, scavenged, and/or hunted there.
- ☼ A third section on ecology discusses the processes and disturbances that regularly occur in grasslands, including drought, fire, grazing, animal digging, and the strategies used by animals and plants to survive those disturbances.
- ☼ The fourth section on grassland management emphasizes conservation and stewardship.
- ☼ The final section contains links for on-line grassland-related resources, including species identification, key publications, and educational activities for students and teachers.

The website became live in March 2012. The information is easily accessible for viewing or printing by: docents who lead tours for environmental organizations, property owners, teachers and students (K-university), ranchers, land managers from agencies and NGOs, as well as interested individuals from the general public.

The project is a collaborative effort through the Coastal Prairie Enhancement Feasibility Study, which is funded by the California State Coastal Conservancy, the Sonoma County Agricultural Preservation and Open Space District, the UC Natural Reserve System, and the UC Davis Office of Research. The educational website is one of three parts of the Coastal Prairie Enhancement Feasibility Study. The second part is a soon-to-be-completed project that maps Coastal Prairie in Marin and Sonoma County, and the third consists of five management trials to track various efforts to control the invasion of purple velvet grass (*Holcus lanatus*). Partners in the study include Ocean Song Farm and Wilderness Center, Sonoma State University, UC Davis Department of Plant Sciences, UC Davis Center for Spatial Technology and Remote Sensing, California Native Plant Society, California Department of Fish and Game's Vegetation Classification and Mapping Program, UC Bodega Marine Reserve, California State Parks, Bodega Pastures, Sonoma Land Trust, and Occidental Arts and Ecology Center.



**Photo 1** (above) *Lupinus* sp. and *Lasthenia californica* near Bodega Marine Lab.  
Photo: Jim Coleman

**Photo 2** (right) Coastal Prairie near Fort Ross.  
Photo: Jim Coleman



# New Research on Seed Zones and Ecological Services of California Native Grasses

by Jim Hanson, President, California Native Grasslands Association, jimhmail@sonic.net

New research findings have been published on the “ecological services” associated with native grasses and grasslands. One paper investigated the soil carbon stored in native grasslands compared with non-native annual grass populations. Another looked at the comparative populations of both beneficial and pest insects in native shrub and grass hedgerows compared with weedy edges that adjoin agricultural fields. A study from the Plumas National Forest evaluated whether the seed collection location of a native grass affects planting success. Below is a summary of each.

## Carbon Storage in Soils by Grasses

Laurie Koteen (2011) at UC Berkeley has measured and compared soil carbon content and carbon cycle processes between populations of perennial native grasses and annual exotic grasses in the Marin County coastal prairie above San Francisco. Their team found that on average “grassland invasion has caused a drop in carbon storage of 40 Mg per hectare in the top half-meter of soil.”

A posting on the Environmental Research Web (2012) summarizes the native grass root and soil carbon interactions in this way, stating that

*the same traits that evolved in response to seasonal water scarcity have resulted in greater carbon storage in soils where perennial grasses are found. Because they are alive year-round, native grasses have higher annual growth rates, resulting in greater carbon accumulation in soil when plant tissues are shed to the soil each year. They also have lower soil carbon loss rates relative to growth than non-native grasses, due to the influence of contrasting water conservation strategies on soil respiration. In summary, our study reveals that beyond impacts on native biodiversity, broad-scale land-cover change can have implications for climate as well.*

## Insects in Shrubs and Native Grass Hedgerows

At a recent workshop near Winters on “Insectary Hedgerows” sponsored by the Yolo County Resource Conservation District, Yolo County Farm Advisor Rachel Long described findings (Morandin et al. 2011) that caught the attention of the 80+ participants. Her slides on the research were striking. One showed a marked higher proportion of beneficial insects in native grass and shrub hedgerows compared with weedy edges. Another showed the inverse. Long explained that beneficial insects from hedgerows can travel as much as 200 meters (over 600 feet) into adjoining agricultural fields, which is considered the mid-point of the average field.

These pest predators and parasitoids use the nectar or pollen that flowering plants in hedgerows provide, and some overwinter in hedgerows when adjoining agricultural fields are fallow or cultivated. The native shrubs were selected to provide a sequential bloom period. The article includes a listing of some of the shrubs and grasses that have been used in the Central Valley sites.

## Native Seed Survival and Reproductive Success

Jay Kitzmiller and Linnea Hanson (2011) published findings on the survival and reproductive success of three species of native grasses in the 1 million-acre Plumas National Forest (PNF). Located on the north end of the Sierra Nevada and east of Chico, the forest ranges in elevation from 1,500 to 6,000 feet.

Eleven common garden test sites were planted into ripped former skid roads and landings using 45 seed sources collected approximately equally across the west to east slopes of the forest. (The forest is about 70 miles across as the crow flies from the low elevation west to the high elevation east side). The geographic sites and elevation gradients had very different moisture and temperature regimes. For instance, the western, southern, and lower elevation sites were wetter and warmer with different spring and

**HANFORD**  
A. R. C. Landscape • Engineering  
APPLIED RESTORATION CONSERVATION

23195 Maffei Road, Sonoma, CA 95476  
Tel: 707 996 6633 Fax: 707 996 6641  
License No. 461167

## Seed Zones *continued*

fall frost dates than the eastern, northern, and higher elevation sites. These moisture and temperature parameters were used because “to survive and reproduce, populations of these cool-season grasses must have different timings and durations of the plant developmental (growth and reproductive) cycle to match these different environmental cycles.”

Based on survival and reproductive success, three consistent “coarse-adaptive patterns” emerged for all three species. Kitzmiller and Hanson note that the findings “support the expectation that natural selective pressures exist across the PNF, and the use of seed zones would help protect the adaptive variation and increase the likelihood that restorations will be successful.” In addition, while “adaptation was found most often on a broad geographic and climatic scale . . . within designated seed zones on restoration sites representing *relatively extreme environments* with strong selective pressures, seed sources should originate from nearby sites that closely match those climatic and environmental extremes.” [italics added]

The paper also addresses the influence of rapid climate change by noting that grasses respond to environmental change via acclimatization, adaptation, and migration. Kitzmiller and Hanson

suggest that “successful future restoration may require multiple species and genetically rich sources that evolved in climatically similar seed zones to the predicted new environments,” such as by taking seed from several populations in local or similar adjacent seed zones.



## References

- Environmental Research Web. 2012. Online: <http://environmentalresearchweb.org/cws/article/insights/48477>.
- Kitzmiller, J., and L. Hanson. 2011. “Patterns of adaptation in three native grasses in northern California.” Online: <ftp://ftp2.fs.fed.us/incoming/r5/NativeGrasses>.
- Koteen, L., D. Baldocchi, and J. Harte. 2011. “Invasion of non-native grasses causes a drop in soil carbon storage in California grasslands.” *Environmental Research Letters* 6(4): 1-10. Online: <http://iopscience.iop.org/1748-9326/6/4/044001>.
- Morandini, L., R. Long, C. Pease, and C. Kremen. 2011. “Hedgerows enhance beneficial insects on farms in California’s Central Valley.” *California Agriculture* 65(4): 197-201. Online: <http://californiaagriculture.unanr.org>.

## CNGA's Bunchgrass Circle

As a nonprofit organization, CNGA depends on the generous support of our Corporate and Associate members. Through their donations, farmers, ranchers, companies, and agencies advocate for the preservation and stewardship of our state's native grasses and the mission of CNGA. If you are interested in regular giving at a higher level — either as an individual, agency, or company — please contact Administrative Director Judy G-Scott at 530.661.2280 or [admin@cnga.org](mailto:admin@cnga.org). Your support is deeply appreciated.

### Corporate Members

*Muhlenbergia rigens* (\$1,000/year)  
Hedgerow Farms

### *Nassella pulchra* (\$500/yr)

Delta Bluegrass Company  
Hanford Applied Restoration & Conservation  
Pacific Coast Seed  
S & S Seeds

### *Poa secunda* (\$250/yr)

Restoration Resources  
Sun City Lincoln Hills Community Association

### Associate Members (\$125/yr)

Bureau of Land Management  
California Native Plant Society, Los Angeles Chapter  
Carducci Associates, Inc.  
City of Davis  
Contra Costa Water District  
Erdman Farms  
Irvine Ranch Conservancy  
Mission Livestock Management  
Orinda Horsemen's Association  
Peninsula Open Space Trust  
Pure Live Seed, LLC  
Ransom Seed Laboratory  
Sacramento Regional County Sanitation District

San Luis National Wildlife Refuge  
Security Seed Services  
Solano County Water Agency  
Sonoma County Ag Preservation & Open Space  
Stone Lakes National Wildlife Refuge  
Thomas Klope Associates  
Truax Company, Inc.  
Westervelt Ecological Services  
Wildlands, Inc.  
Yolo County Resource Conservation District  
Zentner and Zentner



Boggs Lake Ecological Reserve (see May 6 field trip below). Photo: Wade Belew

## CNGA Spring and Summer Workshops

Register by mail, fax/phone: 530.661.2280, or online: [www.CNGA.org](http://www.CNGA.org)

### May 4 Introduction to Sonoma County Grasslands

This 1-day workshop provides an overview of the vernal pool, coastal prairie, and serpentine habitats of the greater Sonoma area. We will also touch on the ecosystem services of these habitats, management challenges, restoration and landscaping, and basic grass taxonomy, anatomy, and morphology.

**Location:** Pepperwood Preserve, Santa Rosa

**Instructors:** Wade Below and others

**Fees:** \$60 CNGA members / \$75 Non-members / \$35 Students w ID

### May 5 Field Trip — Sonoma County Grasslands

Explore coastal prairie and serpentine communities while enjoying spectacular views of the Pacific Ocean.

**Location:** Carpool location to be announced, Santa Rosa area

**Field Trip Host:** Kathleen Kraft

**Fees:** \$25 CNGA members / \$35 Non-members / \$15 Students w ID

### May 6 Field Trip — Boggs Lake Ecological Reserve

Boggs Lake is an undiscovered gem for botanists and bird watchers in the North Bay. Actually a vernal pool, Boggs Lake is not fed by streams or springs and occurs on a substrate of compacted volcanic ash. Covering approximately 90 acres, it is home to 16 native grass species and rare plants, including Boggs Lake hedge-hyssop (*Gratiola heterosepala*) and few-flowered navarretia (*Navarretia leucocephala* v. *pauciflora*). More information and a plant list are available at: [www.nccn.net/~cnps/boggsfl.htm](http://www.nccn.net/~cnps/boggsfl.htm).

**Location:** Carpool location to be announced, Santa Rosa area

**Field Trip Host:** Wade Belew

**Fees:** \$25 CNGA members / \$35 Non-members / \$15 Students w ID

### May 9-11 Improving Land Health and Profitability — A Workshop for Ranchers

Learn how to plan and implement a successful grazing plan that will improve the health and productivity of your land, while keeping costs low and providing good animal performance. This hands-on workshop teaches Allan Savory's step-by-step planning process for developing a grazing plan that is good for the land, livestock, and the pocketbook. Each afternoon you will be outdoors seeing how it is done on a working ranch with a mix of annual and perennial grasslands, oak woodlands, irrigated pasture, and happy livestock. When you leave, you will be able to plan and monitor grazing more successfully on your own ranch. Reduced fees are

## CNGA Workshops Coming in the Fall!

~ Locations and Fees to be announced ~

### Natives in the Built Environment

Delve into the functional uses of native grassland species in residential and commercial landscapes. Learn how these species provide low-input maintenance and aesthetic improvements, while simultaneously providing an array of ecological services, such as improved wildlife habitat, erosion control, and water filtration. **Location:** Davis

### Identifying and Appreciating the Native and Naturalized Grasses of California

Learn about California's grassland ecology and the qualities of specific native grasses for restoration. Become skilled at recognizing the basic groups and common species through work with plant samples in the classroom as well as in the field. **Location:** To be announced

### Grassland Restoration Field Practices Workshop

An opportunity to learn by doing. CNGA instructors will work alongside attendees in preparing and planting a sample grassland. Included is an overview of several tools and techniques for grassland establishment.

**Location:** Elk Grove

## Spring & Summer 2012 Workshops *continued*

made possible by generous assistance and sponsorship from the Mendocino County RCD, NRCS, and Farm Bureau.

**Location:** Willits, CA

**Instructor:** Richard King

**Fees:** \$150 Members & Non-members (3 days) / \$90 Students w ID

### May 24 Restoration and Revegetation with Grasses & Graminoids

An intense, fast-paced, training course designed to acquaint land managers, land owners, contractors, consultants and others with the fine art and strategies of restoration and revegetation with native grassland species. Attendees will be able to apply what they learn about grassland restoration planning, implementing, and managing to their own projects. (Contact [admin@cnga.org](mailto:admin@cnga.org) if interested in lodging at Sedgwick Reserve.)

**Location:** Sedgwick Reserve, Santa Ynez

**Instructors:** Chris Rose, John Anderson, and Jon O'Brien

**Fees:** \$60 CNGA members / \$75 Non-members / \$35 Students w ID

### May 25 Open Ranch Day at Rancho de las Flores

Learn about the plants that are commonly used in grassland restoration projects throughout the state. S&S Seeds will host this

event and provide a casual, behind-the-scenes look at their seed production operations. Included are equipment demonstrations on restoration and management techniques. (Free admission if registered for May 24 Restoration and Revegetation Workshop.)

**Location:** Rancho de las Flores, Los Alamos

**Instructors:** S & S Seeds' staff, Chris Rose, and others

**Fees:** \$35 CNGA Members / \$45 Non-members / \$25 Students w ID

### June 30 Mt. Tamalpais Grassland Ecology, Identification, and Monitoring

Learn about grasslands, grass identification, and monitoring through the hands-on case study of Potrero Meadow on Mt. Tamalpais. A morning classroom session focused on grassland ecology and identification of Potrero Meadow's 20+ grass species will be followed by a brief background on the monitoring design and why it was selected. Then we will shuttle to this scenic meadow near the top of the mountain and put our training into action, taking data that will help form a baseline for meadow restoration. If time and interest allow, we may also harvest grass seed.

**Location:** Marin Municipal Water District and Mt. Tamalpais

**Instructors:** Andrea Williams and others

**Fees:** TBA

---

## Registration Form: CNGA Spring Workshops | 2012

**Mail to: CNGA, P.O. Box 8327, Woodland, CA 95776 ☎ Fax to: 530.661.2280**

Participant's name (print or type please) \_\_\_\_\_

Participant's organization/agency (optional) \_\_\_\_\_

Mailing Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_ Zip \_\_\_\_\_

Preferred phone \_\_\_\_\_ Preferred email \_\_\_\_\_

**Fees:** **May 4 Intro to North Bay Grasslands** (Pepperwood Preserve, Santa Rosa)

\$60/CNGA members  \$75/non-members  \$35/students w ID

**May 5 Field Trip: Grasslands of the Sonoma Coast** (Santa Rosa area)

\$25/CNGA members  \$35/non-members  \$15/students w ID

**May 6 Field Trip: Boggs Lake Ecological Reserve** (Santa Rosa area)

\$25/CNGA members  \$35/non-members  \$15/students w ID

**May 9-11 Improving Land Health and Profitability** (Willits)

\$150/ 3 days/members & non-members  \$90/students w ID

**May 24 Restoration & Revegetation** (Sedgwick Reserve, Santa Ynez)

\$145/CNGA members  \$165/non-members  \$75/students w ID

**May 25 Ranch Day at Rancho de las Flores** (Los Alamos)

\$35/CNGA members  \$45/non-members  \$25/students w ID

**Jun 30 Mt. Tam Ecology, ID, and Monitoring**

Notify me when fees are set.

**Check**

*Payable to California Native Grasslands Association*

**Credit card** Check type:

Visa  MasterCard  American Express

Card number: \_\_\_\_\_

Expiration date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Billing street address for card \_\_\_\_\_

Billing Zip Code: \_\_\_\_\_

**Questions concerning registration?**

*Please contact CNGA by phone/fax: 530.661.2280  
or email: [admin@cnga.org](mailto:admin@cnga.org).*

# Preservation Efforts Under Way for Rare Alkali Grassland–Vernal Pool Complex in Yolo County

by Jennifer Hogan, Past-President, California Native Plant Society, Sacramento Valley Chapter; and Grant Coordinator, Kids in Native Gardens, University of California (UC) Cooperative Extension Service, Sacramento County



San Joaquin spearscale (*Atriplex joaquiniana*). Photo: Ellen Dean

A grassroots movement is growing deep in Yolo County. With the assistance of concerned neighbors and a handful of Woodland residents, past and present, we have come together to preserve a local treasure. The Woodland Regional Park is a 159-acre property located just beyond a new residential development along County Roads 102 and 25 on the east end of Woodland. The eastern edge of this property connects with Conway Ranch, which reaches into the Yolo Bypass. Unique alkali sink soils, a clay pan layer, and the right topography have come together to provide a suite of rare and unusual plants in a vernal pool, alkali prairie, annual grassland, and riparian forest complex. Large trees in the vicinity provide nesting opportunities for the state-listed Swainson's hawk, while the site and Woodland's nearby agricultural fields provide foraging opportunities for this raptor.

Greg Kareofelas, known for his vast knowledge of local butterflies and dragonflies and raised in Woodland, had noticed this site in the 1980s. He and Carol Witham, a well-known vernal pool ecologist, did the first recorded surveys of the site in 1995, identifying the rare plants *Astragalus tener* var. *tener* (alkali milkvetch) and *Lepidium latipes* var. *heckardii* (Heckard's peppergrass). When noticing that the land was being disked for weed control, Greg went to the City of Woodland to persuade them to manage the land in a better way for the rare plants. Then in the early 2000's, Greg was instrumental in involving other botanists in learning more about the site and attempting to preserve the land.

Since the site's "discovery," other special-status plants have been recorded: *Atriplex depressa* (brittlescale), *A. joaquiniana* (San Joaquin spearscale), *Chloropyron* (*Cordylanthus palmatus*) *palmatum* (palmate-bracted bird's-beak), and most recently *Trifolium hydrophilum* (saline clover). The Woodland Regional Park contains a vanishing ecosystem and should be permanently protected and appropriately managed into perpetuity. The site contains rare alkali sink habitat, and the unique flowers provide nectar and pollen to uncommon insects, including native solitary bees and migrating butterflies.

Over the years, Greg recruited others interested in the conservation of this rare habitat, including Glen Holstein, rare plant botanist for California Native Plant Society Sacramento Valley Chapter, and Ellen Dean, curator of the UC Davis Center for Plant Diversity. In 2009, Ellen Dean conducted a Special-Status Plant Survey and report of the site. Last summer, a newly formed group of residents and neighboring conservationists, including fellow Woodland residents Sami LaRocca, an Audubon member; Cathy Little, regional preserve manager, Center for Natural Lands Management;

*continued next page*

CNGA CONSERVATION COMMITTEE

## In Brief: Native Grassland Conservation Update

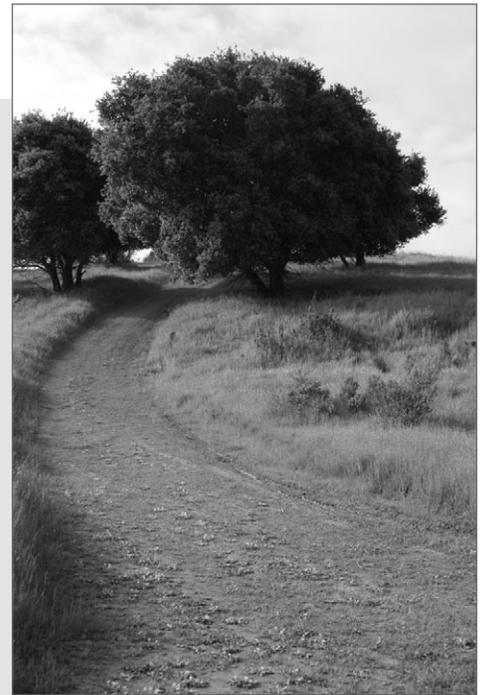
Several proposed developments in California have the potential to degrade or eliminate rare, exemplar native grasslands. Below are updates on four projects the CNGA Conservation Committee has been following and encouraging people to become involved in. You can read more about these developments in past issues of *Grasslands*, as noted below. We encourage you to actively support conservation of important native grasslands in your area.

Last fall, Richmond voters elected a new City Council, which then defeated a mega-casino proposed for the site of the remarkable Pt. Molate coastal prairie (*Grasslands*, Winter 2010).

Recently, Richmond was selected as the new location for the new UC Lawrence Berkeley Lab. The facility will focus on cancer and health, and environment and energy research. There are already UC buildings on the site, some of which will be demolished to make way for the new facilities. There is also a large meadow on the site with the original California oatgrass (*Danthonia californica*) prairie of the San Francisco Bay.

The proposed Walker Ridge wind development, which is located on a site of reportedly marginal wind value, is still under review (*Grasslands*, Summer 2011).

The Oakland Zoo is still preparing to take over 56 acres in the highlands of Oakland's Knowland Park to build an exhibit about "conserving California." The site of the proposed construction is rich with ecotones linking native grassland prairie with a rare chaparral community and oak woodlands (*Grasslands*, Summer 2011). The development would also take away habitat from East Bay hills wildlife. For a glimpse of the park's natural beauty, and for recent updates about protecting this amazing East Bay foothill natural park, see [www.saveknowland.org](http://www.saveknowland.org).



Native grassland and California live oaks are in the way of Oakland Zoo's proposed "conservation exhibit." Footsteps of spring (*Sanicula arctopoides*) dot the fire road. Photo: Jim Hanson

### Preservation Efforts *continued*

Barry Rice, a researcher at UC Davis and professor, Sierra College, Rocklin; and myself (wildlife biologist and hobby botanist) became the Woodland team. With the inclusion of Glen and moral support of many others, we met with City representatives to convince them to sell the City land for preservation.

The City of Woodland owns the land and like many other cities is starved for funds. Revenue could be made from this land, and the City of Woodland has offers from various solar companies to lease the land. However, we are proposing that the City sell the land to the State of California Wildlife Conservation Board, the real estate arm of the Department of Fish and Game. The Center for Natural Lands Management has been identified as a potential entity to manage the land into perpetuity.

We are also looking for other funding opportunities to help purchase the land and provide an endowment that will cover annual management costs. The land would become part of the reserve system for the Yolo County Natural Heritage Plan. Through a true

grassroots effort, this one-of-a-kind alkali grassland vernal pool complex can survive and thrive for generations to come.

A more detailed article can be found in the California Native Plant Society Sacramento Valley Chapter Newsletter, *Hibiscus*, January 2012 edition.





**Sun City Lincoln Hills**  
Community Association

**965 Orchard Creek Lane, Lincoln, CA 95648**  
**916-625-4000; [www.suncity-lincolnhills.org](http://www.suncity-lincolnhills.org)**

Active adult retirement community.

***It's more than a place to live. It's a way to live.***

We protect and preserve the 500 acres of open space and preserved wetlands, riparian, and oak-woodlands that surround Sun City Lincoln Hills. You can go to [HTTP://WILDLIFEHERITAGE.ORG](http://WILDLIFEHERITAGE.ORG) for more information.

# CNGA Contact List

Judy G-Scott, Administrative Director  
PO Box 8327, Woodland, CA 95776  
Phone/Fax: 530.661.2280  
admin@cnga.org

Liz Cieslak, Events Coordinator  
events@cnga.org

Catherine Little, Chair, *Grasslands* Editorial Committee  
741 East Street PMB #383, Woodland, CA 95776  
grasslands@cnga.org

## Board of Directors

### Officers

Jim Hanson, President  
State Department of Transportation  
438 49th Street, Oakland, CA 94609  
510.388.7439 jimhmail@sonic.net

Catherine Little, Vice-President  
741 East Street PMB #383, Woodland, CA 95776  
cathy.little.cnga@gmail.com

Elise Tulloss, Secretary  
Department of Plant Sciences, Graduate Group in  
Ecology, UC Davis  
291 Robins Hall, One Shields Ave, Davis, CA 95616  
530.754.4869 emtulloss@ucdavis.edu

Zachary Principe, Treasurer  
The Nature Conservancy  
420 W. Broadway, Suite 1350, San Diego, CA 92101  
909.815.2227 zprincipe@tnc.org

### Directors At-Large

Daniel Blankenship (2011-2012)  
CA Dept of Fish and Game  
24024 W. Dandelion Lane, Valencia, CA 91354  
661.259.3750 dsblankenship@dfg.ca.gov

Mary Fahey (2012-2013)  
Colusa County Resource Conservation District  
100 Sunrise Blvd, Ste B, Colusa, CA 95932  
530.458.2931 mary.fahey@ca.usda.gov

Andrew Fulks (2012-2013)  
UC Davis Putah Creek Riparian Reserve  
2723 Ganges Place, Davis, CA 95616  
530.752.0763 amfulks@ucdavis.edu

Erik Gantenbein (2011-2012)  
916.709.0045 erikg22@att.net

Diana (Immel) Jeffery (2012-2013)  
Sonoma-Marine Coastal Grasslands Working Group  
133 Clara Avenue, Ukiah, CA 95482  
707.671.7616 dlimmel@ucdavis.edu

Richard King (2011-2012)  
707.217.2308 rking1675@gmail.com

Kathleen Kraft (2011-2012)  
Sonoma-Marine Coastal Prairie Working Group  
PO Box 747, Occidental, CA 95465  
707.799.2018 kkraft@sonic.net

JP Marié (2012-2013)  
UC Davis Putah Creek Riparian Reserve  
1 Shields Ave, 436 Mrak Hall, Davis, CA 95616  
530.304.3251 jpmarie@ucdavis.edu

Ingrid Morken (2012-2013)  
WRA, Inc.  
2169-C E. Francisco Blvd, San Rafael, CA 94901  
415.454.8868 morken@wra-ca.com

Jon O'Brien (2012-2013)  
California Land Stewardship Institute  
707.320.3832 jonmobrien@gmail.com

Chad Aakre (Alternate, 2012)  
Restoration Resources, Inc.  
3888 Cincinnati Avenue, Rocklin, CA 95765  
916.408.2990  
c.aakre@restoration-resources.net

**DELTA BLUEGRASS**  
**Goes Native!**

*We Lead the Industry in Restoring California's Natural Resources.*

**INTRODUCING 6 BLENDS OF CALIFORNIA NATIVE SOD**

Delta Native Heartland Sod™ ■ Native Preservation Mix™  
Native Mow Free™ ■ Biofiltration Sod™

*For Bio-swales, Medians, Roadsides, Irrigation Canals, Erosion Control and Environmental Mitigation Areas*

Native Bentgrass™ ■ Delta Grassland Mix™  
*For Urban Landscapes*

**50% Water Savings**  
*With All Blends*

Visit our website for more Native Blend details and features.  
[www.deltabluegrass.com](http://www.deltabluegrass.com)

**DELTA BLUEGRASS COMPANY**  
(800) 637-TURF  
C-27 752734

California Native Grasses,  
Wildflowers & Forbs

Site Specific & Source Identified | Seed Collection & Increase

**Pacific Coast Seed INC.**

Also distributing – AM 120 mycorrhizal inoculants, BioSol 7-2-1 Mix®, Hydrostraw™ & fertilizers, mulches & soil stabilizers

**www.pcseed.com**

(925) 373-4417 • Fax (925) 373-6655 | 533 HAWTHORNE PL. ACE • LIVERMORE, CA 94550

# CNGA Membership Application

Detach and mail this form with check made out to CNGA. | Send to: CNGA, P.O. Box 8327, Woodland, CA 95776. | Students, send photocopy of current ID.

Name \_\_\_\_\_ Title \_\_\_\_\_  
 Organization \_\_\_\_\_  
 Street \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone \_\_\_\_\_ Fax \_\_\_\_\_ E-mail \_\_\_\_\_

CNGA members have voting status, and receive the Grasslands newsletter, a monthly e-blast, and discounts to CNGA events.

## Individual Membership

- Regular member: \$45/year     Student: \$30/year     Retired: \$30/year     Life member: (one-time payment) \$500

## Individual Joint Membership

- CNGA + SERCAL\*: \$70/year     CNGA + CAL-IPC\*\*: \$75/year     CNGA + SERCAL\* + CAL-IPC\*\*: \$105

\*SERCAL = California Society for Ecological Restoration    \*\*CAL-IPC = California Invasive Plant Council

## Corporate Membership and Benefits

All employees of a corporate member receive member pricing when registering for CNGA events.

All membership benefits are good for one year from the month of purchase.

Membership Level	Annual Cost	Online (color) Ads w/link to member website <sup>1</sup>	Grasslands (b&w) Ads currently 4 issues per year	Employee Memberships <sup>2</sup>	Grasslands Subscriptions <sup>3</sup>
<input type="checkbox"/> <i>Muhlenbergia rigens</i>	\$1,000	Half page (570 x 330 pixels) at top of CNGA sponsor page	Half page (7.625 x 4.375) 300 dpi jpeg, tif or pdf file	6	4
<input type="checkbox"/> <i>Nassella pulchra</i>	\$500	Quarter page (256 x 296 pixels) below <i>Muhlenbergia</i> listings	Quarter page (3.75 x 4.375) 300 dpi jpeg, tif or pdf file	5	3
<input type="checkbox"/> <i>Poa secunda</i>	\$250	Bus.-card size (129 x 200 pixels) below <i>Nassella</i> listings	Bus.-card size (3.5 x 2.25) below <i>Nassella</i> listings	4	2
<input type="checkbox"/> Associate/Agency	\$125	Text listing below <i>Poa</i> sponsors for 1 calendar year	Text listing published in <i>Grasslands</i> for 1 calendar year	3	1

<sup>1</sup>If there is more than one sponsor per level, the sponsors will be listed alphabetically by the sponsor's name. <sup>2</sup>Employee memberships include all the benefits of an individual membership, except that a personal copy of *Grasslands* is not guaranteed. <sup>3</sup>Company may opt for fewer subscriptions.



### California native grassland seed

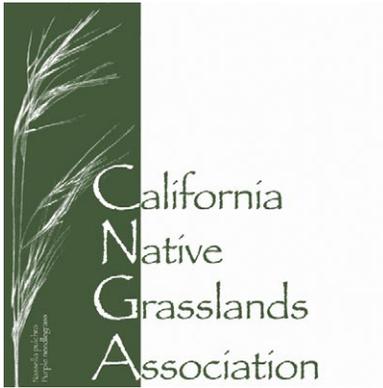
- Multiple ecotypes available
- Seed mixes customized for your needs
- Plug plant nursery
- Native grass straw from clean production fields
- Project consulting with years of experience
- Site-specific contract growing
- Educational tours for schools, organizations, agencies, and individuals

Visit our website or contact us for more information!

Phone: (530) 662-6847  
 Fax: (530) 662-2753

Headquarters: 21905 County Road 88  
 Winters, CA 95694  
 Mailing Address: 21740 County Road 88  
 Winters, CA 95694

www.hedgerowfarms.com  
 info@hedgerowfarms.com



PO Box 8327  
Woodland, CA 95776  
[www.CNGA.org](http://www.CNGA.org)

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



**Register now for Spring  
& Summer Workshops!**  
see pages 9-10

Front cover photo: Bear Valley, April 2007. *Photo: Jack Alderson*  
Back cover photo: Howard Ranch, March 2009. *Photo: Sara Sweet*

