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Association

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GRASSLANDS

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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.

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For membership and other organization information including program information related to workshops, symposia, and field trips, please contact CNGA Administrative Director via admin@cnga.org.

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From the President's Keyboard

Looking Ahead to Our Third Decade

by Jim Hanson, President

At the fall meeting of the CNGA Board of Directors, we brainstormed about what still needs to be done "to promote, preserve, and restore the native grasses and grassland ecosystems of California."

CNGA has been working on this mission since it began over 20 years ago. Today, native grasses are specified in native plant revegetation projects, used for erosion control, planted to treat runoff from roadsides, and are represented in a body of research on the dynamics, ecology, and ecological services of the state's widespread grassland communities.

Yet, there is clearly more work to do.

Although much valuable research has been done during the last 2 decades on native grasses, we still do not have a full picture of how the state's remaining native grassland/soil systems continue to be resilient over time, nor what their contribution could be to facilitating rain water infiltration and carbon storage in our watersheds.

Restorationists have been able to re-seed native grasses into large disturbed landscapes, but scientists and restorationists are still trying to determine the factors that enhance effective, long-term return of native grass and forb species in the highly altered, highly competitive, and still changing herbaceous soil layer of 21st century California.

Thanks to the efforts of the CA Department of Fish and Game and the California Native Plant Society, the second edition of the *Manual of California*

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***Grasslands* Submission Guidelines**

All submissions are reviewed by the *Grasslands* Editorial Committee for suitability for publication. Submissions include peer-reviewed research reports and non-refereed articles, such as progress reports, observations, field notes, interviews, book reviews, and opinions. Contact the Editorial Committee Chair for formatting specifications. Submissions should be sent as email attachments to the *Grasslands* Editorial Committee Chair via grasslands@cnga.org.

Submission deadlines for articles: Spring 2012 — Feb 15, 2012 Summer 2012 — May 15, 2012
Fall 2012 — Aug 15, 2012 Winter 2013 — Nov 15, 2013

Looking Ahead *continued*

Vegetation describes 90 native grass and grass-like sedge/rush plant alliances, along with assessments of rarity, alliance criteria, and range maps of the plants. Still, only a few counties and cities have policies to protect and retain special populations of native grassland that give a location a unique ecological and scenic identity.

One theme mentioned several times during the Board's brainstorming session was a desire for the wider public to become more aware of California's valuable native grasses, prairies, and meadows. Having grant or development funds would certainly make this public awareness objective easier to accomplish, but not having those funds should not stop us. Each of you could enlighten a colleague, an official, a neighbor, or a class of students on something about our state's heritage prairies and meadows. Some of you will volunteer to yank invasive weeds out of a local native grassland stand. Others will submit comments for CEQA review when important plant communities are present and threatened.

Conservation ecology is still in its infancy. Protection of California's valuable plant biodiversity has not reached mainstream public policy. As noted in the Epilogue to *California Grasslands* (Stromberg, Corbin, D'Antonio, UC Press, 2007), "We still have relatively little information on the overall distribution and abundance of native-species-dominated grasslands across the state."

Will you join with CNGA in the coming decade to do the good work that still needs to be done? Choose how you want to be involved in spreading the word or taking action to "promote, preserve, and restore the native grasses and grassland ecosystems of California." We welcome your participation.

Meet the 2012 CNGA Board of Directors

CNGA members have voted, and the results are in! Your 2012 Board of Directors has 4 new officers, 6 new Directors-at-Large, and 1 Alternate.

Officers

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

New Directors-at-Large (2012-2013)

Mary Fahey
Andrew Fulks
Diana (Immel) Jeffery
JP Marié
Ingrid Morken
Jon O'Brien
Chad Aakre (Alternate)

Returning Directors-at-Large for another term:

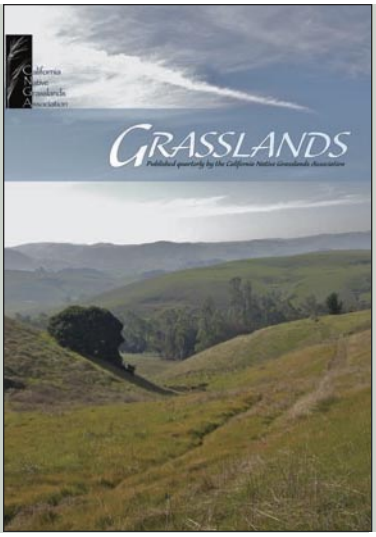
Daniel Blankenship
Erik Gantenbein
Richard King
Kathleen Kraft

CNGA extends great thanks and appreciation to the following retiring Board Members. Their contributions were extraordinary, and we will miss them on the Board.

Wade Belew
Liz Cieslak
Lindsay Dailey
Barbara Going
Sara Sweet
Bryan Young

Welcome Julie St. John to the CNGA Staff

Beginning with this issue, Julie St. John will be Layout Editor for *Grasslands*. We look forward to working with Julie and watching as her design concepts emerge over the coming months in *Grasslands*. Julie has been working for regional conservation and environmental organizations for almost 20 years, designing newsletters, brochures, and many other informational materials for the Arizona Native Plant Society, California Society for Ecological Restoration, Native Seeds/SEARCH, and Sky Island Alliance. Julie lives in Tucson, Arizona, and is grateful to be joining the CNGA team and learning more about California's native grasses.



In this issue

Alternative Turf Demonstration Project

by Chuck Ingels, Environmental Horticulture Advisor, caingels@ucdavis.edu,
University of California (UC) Cooperative Extension Service, Sacramento County

Many agencies, landscape managers, and property owners are interested in planting drought-tolerant turf species. In addition to reducing water use, these species require less mowing and therefore reduce greenhouse gas emissions and save energy and money. However, these species can have drawbacks as well, such as high installation costs or dormancy periods in summer or winter that result in the turf turning brown and unsightly.

The Sacramento County Department of Water Resources, as part of its River-Friendly Landscaping program, received a grant from the U.S. Environmental Protection Agency (EPA), in part to test potential low-water-use turf species. Included in the study are a standard tall fescue (*Festuca arundinacea*)/bluegrass (*Poa pratensis*) mix, buffalograss (*Buchloe dactyloides*), and two species of native sedge (*Carex* spp.), all under different irrigation regimens. The study is also comparing six native grass species to determine their potential as turf.

Site Location and Design

The study site is located at Florin Creek Park in Sacramento. It was developed and is maintained by the Sacramento County UC Cooperative Extension in collaboration with the Southgate Recreation and Park District and UC Master Gardeners. A 4-foot fence surrounds the site, and plots are labeled so the species can be viewed at any time. The plots are being managed organically, so no herbicides or pesticides are being applied, and organic fertilizers are used.

At this site, each of the species below was planted within three 12-foot x 12-foot plots in September 2010. Each plot was watered at 80%, 60%, and 40% ET_o (reference evapotranspiration, found on the UC Integrated Pest Management web site); all plots were watered every 4 days during the summer using Hunter MP rotator nozzles.

1) Tall fescue/bluegrass, sodded
2) UC Verde buffalograss, planted as plugs
3) Split plots of field sedge (*Carex praegracilis*) and dune sedge (*Carex pansa*), planted as liners

Also included were six 12-foot x 6-foot plots of California native grass species:

Seashore bentgrass (*Agrostis pallens*)

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Figure 1 UC Verde buffalograss (left) and tall fescue blend (right), with shading trial also under way. Top plots 80%, middle plots 60%, and lower plots 40% ET_o. UC Verde in 40% ET_o grew less but showed little stress, whereas tall fescue shows severe stress, especially in a patch (inset), which was later hand-watered to prevent death.

from left **Figure 2** Field sedge (right) had more rust in the wet winter of 2011 than dune sedge (left). **Figure 3** Tufted hairgrass (left) with characteristic light green color, and darker Molate fescue (right), late May 2011. **Figure 4** Vigorous Molate fescue shows a typical wave form in summer 2011, lower center to upper right. June grass is on the left, and purple needlegrass in upper center triangle.

Alternative Turf *continued*

Hall's bentgrass (*Agrostis hallii*), removed October 2011 and replanted with purple needlegrass (*Nassella pulchra*)

Molate red fescue (*Festuca rubra*)

Tufted hairgrass (*Deschampsia caespitosa*)

Junegrass (*Koeleria macrantha*)

Blue grama (*Bouteloua gracilis*), tall and short varieties (planted May 2011)

All species were seeded except Hall's bentgrass, which was planted as plugs at 12-inch spacing (seed was not available), and blue grama, which was planted as both plugs and seeds. A "meadow" was also included, in which at least one plant of each species used in the mowed turf plots was allowed to grow to full size.

Results to Date

The irrigation treatments began July 28, 2011, only after the sedge plots had moderately filled in. The mowed clippings from all plots were weighed (fresh weight) to determine the growth of each species through the year. Less mowing of a species under a given irrigation regime can mean less fuel use and air pollution, and reduced clipping weights with deficit irrigation is a sign of plant stress.

The **tall fescue** blend is frequently used because it tolerates some traffic and is dark green year-round. In the 40% ET_o tall fescue plot, severe water stress appeared by mid-August in a large patch (Fig. 1); we hand-watered the patch so the UC Verde and sedge plots could still receive 40% ET_o, which shows how sensitive tall fescue is to drought stress. Some water stress was even visible under 60% ET_o, which shows why this species is typically watered at 80% ET_o.

UC Verde buffalograss grows similarly to bermudagrass, but is less invasive and spreads by stolons (not rhizomes). Like bermudagrass, it turns brown and goes dormant in cold winter areas. Its flowers produce very little pollen. It is best planted in May, so that stolons can quickly fill in and weed growth is reduced. Our September planting at 12-inch spacing resulted in some initial growth, but dormancy quickly set in; the first mowing occurred in early June. In August, clipping weights were slightly lower than those of tall fescue in the 80% ET_o plots, the same in the 60% plots, and higher in the 40% plots. Clipping weights in the 80% and 60% plots were nearly identical, showing why warm-season turf is typically watered at 60% ET_o. No plant stress was visible in the 40% plot (Fig. 1), so the standard ET_o for this species could possibly be lowered.

Sedges are not grasses, but some species can be used to create an excellent turf. They are generally considered very drought tolerant and can be mowed periodically or left unmowed. In our demonstration plot, the sedge liners were planted 9 inches apart and have largely filled in; however, small gaps between plants remain because rhizome growth is fairly slow. Closer planting would have helped, but the costs would be higher. Field sedge grew taller and faster than dune sedge, resulting in nearly double the clipping weights. In the wet winter and spring of 2011, field sedge had greater rust disease than dune sedge (Fig. 2). Patches of sedge, especially field sedge, went dormant in late July even in the 80% ET_o plot. Field sedge plants in the 40% ET_o plot went fully dormant and partially brown, whereas dune sedge was still mostly green. Late summer clipping weights of even the 80% ET_o sedge plot were far less than spring weights.

Native grasses. So far, three of the most promising native grasses are seashore bentgrass, Molate red fescue, and tufted hairgrass. Although their spring clipping weights were similar to those of tall fescue, in the hot Central Valley they are semi-dormant and not fully green in summer. Irrigation was reduced to 60% ET_o for a period in summer, and these species became unsightly (Fig. 3) until restored to 80% ET_o. However, root growth was likely not

continued next page

from left **Figure 5** Blades become shredded upon mowing June grass, and the hairy clippings tend to remain behind or sometimes clog the mower. **Figure 6** June grass forms relatively small and upright plants when left unmowed, and are easily managed. **Figure 7** Seashore bentgrass (right) spreads much faster than Hall's bentgrass (left).

Alternative Turf *continued*

substantial because the plants were only less than a year old and were mowed, both of which may have reduced their drought tolerance. In the meadow, foliage in the Molate fescue planting grew very dense and leaned over in typical wave form (Fig. 4).

Blue grama makes an excellent warm-season turf and is drought tolerant, but it is fully dormant in winter in the Central Valley. The dwarf variety (unnamed) produces about half the biomass as the tall variety (Hachita). Both types remained green with 60% ET_o.

Junegrass did not perform well as a turf species. When mowed, the tips of the blades were consistently shredded, and the hairy clippings sometimes clogged the mower (Fig. 5). However, it is an excellent ornamental grass when not mowed, as it is fairly compact and upright (Fig. 6). Our planting with Hall's bentgrass was not successful, as growth from rhizomes was slow, and it never filled in. The individual Hall's bentgrass plant spread much slower than the seashore bentgrass plant (Fig. 7).

Conclusions

UC Verde buffalograss is one of the most promising turf species for reducing water use. We plan to spray a portion of each plot with turf colorant and to plant a portion to annual ryegrass in November to see if we can overcome the aesthetic drawback caused by winter dormancy. Sedges are also promising — mainly dune sedge, which produces less growth and less rust than field sedge, and the mowed turf is less stiff than field sedge. Several native grasses look promising, but all have at least some dormant or semi-dormant period. Dormancy is less of an issue in coastal areas. This project continues through 2012, and we expect to learn much more about these species over the next year.

For more information on these alternative turf species, photos, and regular updates on the results of our demonstration plots, visit *www.UCANR.org/turfproject.*

Acknowledgments

Plant donations were provided by Florasource Ltd., Delta Bluegrass Company, Native Sons Nursery, Pacific Coast Seed Company, and Hedgerow Farms. Our thanks to CNGA Board Member Jim Hanson for assistance with planting of blue grama.

Planning a Hedgerow in Winters, California

by Alex Koutzoukis, Landscape Architecture undergraduate student, akoutzoukis@ucdavis.edu, UC Davis

During Fall 2010, I had a 3-month internship at Hedgerow Farms, north of Winters, California, where I learned about native grassland restoration. For one of my projects, together with Jeff Quiter and other Hedgerow Farms staff, we planned a simple hedgerow planting for a transplant nursery near Winters. The project involved planting native grasses, trees, and shrubs (1) in a roadside swale, (2) around a stormwater detention pond, and (3) as a windbreak. The client's main concerns were cost and ease of maintenance, while providing habitat and protection from north winds.

Methods

1. Site Inventory A walk-through of the site provided measurements and recording of soil texture, moisture, winter flooding, and other conditions that affect growth. Measurement techniques included measuring the width and depth of swales by hand, and then measuring lengths using Google Earth. These measurements were then used to create a simple base map in AutoCAD (computer-aided design software) (Fig. 1).

2. Site Analysis On the base map of the site, areas subject to winter flooding and areas with drier soil were identified. Because the client wanted to shelter greenhouses from winter north winds, it was determined to plant a windbreak along the north edge of the property.

3. Plant Selection and Design The swales at this site typically had two distinct moisture conditions, so the planting areas were divided into two zones. "Dry" zones typically occurred higher on slopes and were not subject to winter flooding or standing water. "Wet" zones were areas that had standing water for extended periods of time. (See Fig. 2 next page for a list of plant species.)

Roadside Swale. Due to year-round runoff from the greenhouse facilities, the southern swale had standing water throughout the year. A wet seed mix was used for the lower slope, and a dry mix for the upper slope. Three different species of deciduous trees were planted with 20-foot spacing. To buffer the parking lot, a deergrass "hedge" (*Muhlenbergia rigens*) was planted with 4-foot spacing along the length of the swale.

Windbreak. To shield greenhouses from winter north winds, a hedgerow was planted along the north property line. The same tree species were used, with the addition of evergreen species, to create a more effective windbreak. Trees were spaced 20 feet apart, with shrubs and a strip of the dry native grass mix planted between them. By keeping plantings in a straight line, it will be easier for the client to maintain the hedgerow, although more naturalistic variations are possible and can provide higher quality habitat for wildlife.

Detention Pond. At the detention pond, both the wet and dry seed mixes were planted, similar to the roadside swale. In addition to the seed mix, plugs of various riparian species such as Santa Barbara sedge (*Carex barbarae*), Baltic rush (*Juncus balticus*), and deergrass were planted sporadically along the water's edge to help reduce erosion and enhance the riparian habitat.

4. Cost Estimation Using the base map created in AutoCAD, I was able to estimate the cost of plant material for this project, which was one of the client's main concerns. Using price-per-acre of each different seed mix multiplied by acreage, the cost estimates for the grass seed could be quickly estimated. The total

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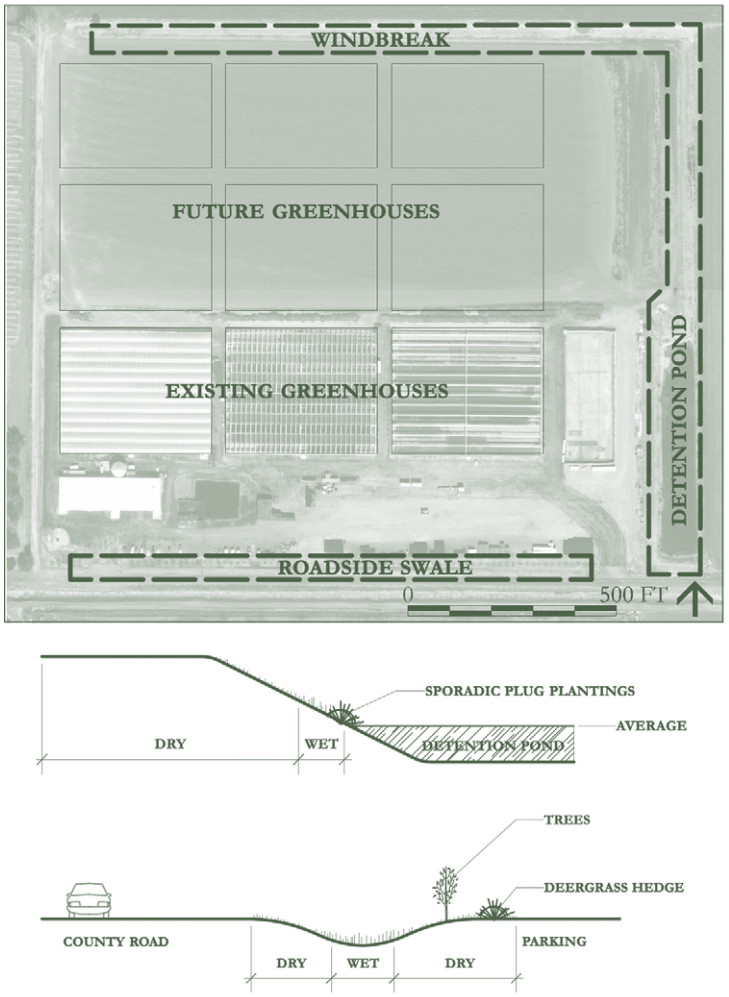

Figure 1 Project map of hedgerow planting (top) with details of detention pond and roadside swale (bottom).

Figure 2 List of species chosen for the two seed mixes, plugs, and tree and shrub plantings. More detailed information on these species is available on *www.calflora.org* and *www.plants.usda.gov*. The plants on this list are native to Yolo County, with the exception of pomegranate, denoted by asterisk**.

Dry Seed Mix
California barley *Hordeum brachyantherum californicum*
Junegrass *Koeleria macrantha*
California oniongrass *Melica californica*
Nodding needlegrass *Nassella cernua*
Purple needlegrass *Nassella pulchra*

Wet Seed Mix
Santa Barbara sedge *Carex barbarae*
Slender sedge *Carex praegracilis*
Baltic sedge *Juncus balticus*
Deergrass *Muhlenbergia rigens*

Shrubs
Saltbush *Atriplex* spp.
Coyote brush *Baccharis pilularis*
Mulefat *Baccharis salicifolia*
Ceanothus *Ceanothus* spp.
California coffeeberry *Frangula californica*
Toyon *Heteromeles arbutifolia*
Pomegranate *Punica granatum***
California wildrose *Rosa californica*
Common snowberry *Symphoricarpos albus*

Trees
California sycamore *Platanus racemosa*
Fremont cottonwood *Populus fremontii*
Valley oak *Quercus lobata*
California laurel *Umbellularia californica*

Planning a Hedgerow *continued*

cost of grass seed and plugs (not including trees or shrubs) for this project was $4,300 for 4.2 acres of planting area, or $1,023.81/acre.

Summary

During this internship with Hedgerow Farms, I learned about the different strategies and practices that go into native grassland restoration, and I implemented them in an actual design project with a landscape architecture perspective. By using the AutoCAD software commonly used by landscape architects, I was able to quickly estimate costs and compare different configurations and options, a technique that might be useful in future projects.

Boggs Lake Ecological Reserve (see Workshop #5 below). *Photo by Wade Belew.*

Register Now for CNGA Spring Workshops

Register by mail, fax/phone: 530.661.2280, or online: www.CNGA.org

1. March 22: Emerging Botanical Technologies: Using New Tools to Identify, Map, and Explore Wild Diversity

This training workshop reviews diverse new tools for exploring grasslands, including Calflora's mobile phone apps, web-based tools, and GPS cameras. We will provide enough iPhones, Android phones, tablets, and GPS cameras to ensure that every attendee has the chance to get "hands on" in the field. By the end of this class, you will be familiar with using these tools and ready for your best spring wildflower season ever!

Location: American River Parkway Foundation, Sacramento
Fees: $120 CNGA Members / $140 Non-members / $75 Students w ID

2. April 20: CNGA Field Day at Hedgerow Farms

Join us for this 5th annual opportunity for practical, hands-on learning about native grasses and grassland restoration. Enjoy the casual atmosphere for networking, and learn from experienced professionals.

Location: Hedgerow Farms, Winters
Fees: $60 CNGA Members / $75 Non-members / $35 Students w ID

3. May 4: Introduction to North Bay Grasslands*

This 1-day workshop—with lecture, lab, and field components—provides an overview of the vernal pool, coastal prairie, and serpentine habitats of the greater North Bay area. Participants will learn basic grass identification of five common native grasses and five common non-native grasses. 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
Fees: $60 CNGA members / $75 Non-members / $35 Students w ID

4. May 5: Field Trip: Grasslands of the Sonoma Coast*

This is an opportunity to explore coastal prairie and serpentine communities while enjoying spectacular views of the Pacific Ocean.

Location: Carpool from Santa Rosa; location forthcoming
Fees: $25 CNGA members / $35 Non-members / $15 Students w ID

5. May 6: Field Trip: Boggs Lake Ecological Reserve*

Boggs Lake is an undiscovered gem for botanists and bird watchers in the North Bay. Boggs Lake is actually a vernal pool, as it is not fed by streams or springs. Occurring on a substrate of compacted volcanic ash, it has been recognized as California's largest vernal pool, 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*). This unique property is co-owned and managed by the CA Department of Fish and Game and The Nature Conservancy. More information and a plant list are available at: *www.nccn.net/~cnps/boggsfl.htm*

Location: Carpool from Santa Rosa; location forthcoming
Fees: $25 CNGA members / $35 Non-members / $15 Students w ID

6. May 9-11: Holistic Planned Grazing for Ranchers

This learn-by-doing workshop teaches Allan Savory's step-by-step holistic planned grazing process—part of a novel new framework for decision-making. You will learn key principles and complete an excellent grazing plan. With daily field trips, you will learn from experienced ranchers why the principles, planning, and monitoring are critical for grassland health AND animal performance.

Location: Willits **Fees:** *Fees to be determined*

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**Note:* Rather than offering a 2+-day Symposium as advertised in the fall issue of *Grasslands*, CNGA is offering a Friday workshop, "Introduction to North Bay Grasslands" along with a Saturday coastal prairie field trip and a Sunday vernal pool field trip. This change is intended to be more affordable and flexible. Participants will have first-hand exposure to local grasslands and learn about grasslands research currently under way in the North Bay region.

Spring 2012 Workshops *continued*

7. May 24: Restoration and Revegetation with Grasses and 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.

Location: Sedgwick Reserve, Santa Ynez
Fees: $145 CNGA Members / $165 non-member / $75 student w ID

8. May 25: Open Ranch Day at Rancho De Las Flores

This is a terrific opportunity to learn about the plants that are commonly used in grassland restoration projects throughout the state. S & S Seeds will host this Open Ranch Day and provide a casual, behind-the-scenes look at their seed production operations. Included are equipment demonstrations on restoration and management techniques. Note: **Free admission** if registered for May 24 Restoration and Revegetation Workshop (#6 above).

Location: Rancho De Las Flores, Los Alamos
Fees: $35 CNGA Members / $45 Non-members / $25 Students w ID

Look for these CNGA Workshops in Fall 2012!

Locations and Fees to be announced

9. 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

10. 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

11. Grassland Restoration Field Practices Workshop

This workshop offers 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

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:

1. ***Emerging Botanical Technologies*** *(Sacramento, CA)* ☐ $120/CNGA members ☐ $140/non-members ☐ $75/students w ID
2. ***CNGA Field Day at Hedgerow Farms*** *(Winters, CA)* ☐ $60/CNGA members ☐ $75/non-members ☐ $35/students w ID
3. ***Intro to North Bay Grasslands*** *(Pepperwood Preserve, Santa Rosa, CA)* ☐ $60/CNGA members ☐ $75/non-members ☐ $35/students w ID
4. ***Field Trip: Grasslands of the Sonoma Coast*** *(Carpool location forthcoming, Santa Rosa area)* ☐ $25/CNGA members ☐ $35/non-members ☐ $15/students w ID
5. ***Field Trip: Boggs Lake Ecological Reserve*** *(Carpool location forthcoming, Santa Rosa area)* ☐ $25/CNGA members ☐ $35/non-members ☐ $15/students w ID
6. ***Holistic Planned Grazing for Ranchers*** *(Willits, CA)* ☐ Notify me when fees are set.
7. ***Restoration & Revegetation with Grasses & Graminoids*** *(Sedgwick Reserve, Santa Ynez, CA)* ☐ $145/CNGA members ☐ $165/non-members ☐ $75/students w ID
8. ***Open Ranch Day at Rancho De Las Flores*** *(Los Alamos, CA)* ☐ $35/CNGA members ☐ $45/non-members ☐ $25/students w ID
9. ***Natives in the Built Environment*** *(Davis, CA)* ☐ Notify me when date and fees are set.
10. ***Identifying the Native and Naturalized Grasses of California*** ☐ Notify me when location, date, and fees are set.
11. ***Grassland Restoration Field Practices Workshop*** *(Elk Grove, CA)* ☐ Notify me when date and fees are set.

Send to payment to address above: ☐ Check payable to California Native Grasslands Association
☐ Credit card (please check type) ☐ Visa ☐ MasterCard ☐ American Express

Card number _____ **Expiration date** ____/____

Street address for card _____ **Zip Code** _____

Questions concerning registration? Please contact CNGA by phone/fax: 530.661.2280, or email: admin@cnga.org.

Major Issues in Grasslands Weed Control: *An Interview with Experts in the Field*

by Elise M. Tulloss[1], B.M. Going[2], Catherine A. Little[3], and Sarah Hoskinson[4]

UC Davis Putah Creek Riparian Reserve Steward JP Marié walks through native grasses at the Reserve's Russell Ranch. *Photo courtesy Putah Creek Riparian Reserve.*

Weed control is a major issue influencing the success of grassland restoration and conservation, as well as forage quality for rangeland animals. Not surprisingly, weed control was identified as by far the most valuable topic of grassland research among CNGA's membership according to a survey conducted in 2010. The effective control of noxious weeds is not an easy task and involves dealing with multiple issues, including management techniques, information gaps, funding, and regulatory constraints. Like many of you, we wanted to know more about the current challenges facing effective weed control, so we went to the experts. We surveyed several grassland managers and researchers to get a better understanding of what factors limit our ability to eradicate weeds and support native biodiversity.

The Experts

Joe DiTomaso is a professor in the Department of Plant Sciences at UC Davis. He received his Ph.D. in Botany from UC Davis in 1986 where he specialized in plant physiology as part of the Weed Science Program. He has been working as a weed ecologist for 30 years and specializing in invasive plant management for 17 years. His research focuses on understanding the biology, ecology, and management of invasive plants.

Andrew Fulks is the manager of the UC Davis Putah Creek Riparian Reserve, Davis. He holds a B.A in Landscape Architecture and is a licensed landscape architect in California. He has been involved in weed control for 16 years.

Gillies Robertson received his bachelor's degree in Natural Environment and Wilderness Studies from the University of Tasmania in Australia in 2007. His weed management experience started out in Sydney, Australia, working for a private contractor on a variety of projects. He relocated to California and now works as Vegetation Management Specialist for the Yolo County Resource Conservation District.

Richard King works for the USDA Natural Resources Conservation Service, serving northern California. He is also a certified Rangeland Manager with the Society for Range Management. He holds a B.S. in Wildlife Management and M.S. in Biology and has been a rangeland specialist active in weed management since 1975.

Dave Harris received his bachelor's degree in environmental studies from UC Santa Barbara. He has 6 years of full-time experience working on ecological restoration projects, including his current project, in which he manages a 69-acre, heavily disturbed parcel on which weed control is just beginning.

Major Challenges to Effective, Long-term Weed Control

We interviewed the group to determine what the most prominent challenges were in sustaining effective weed control. According to the respondents the major challenges are:

- Adequate funding for the task at hand or the project duration (Harris)
- Pressure of adjacent lands creating an ongoing cost of weed control (Fulks, Robertson)
- Restrictive budgets for wildland management (DiTomaso)
- Approach to weed control, which can influence long-term success, such as re-vegetating before the seed bank is exhausted (Harris)
- Continued introduction of new potentially invasive species without biological control counterparts (King)

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Grasslands Weed Control *continued*

- Implementing weed control in environments where there are desirable native plants (DiTomaso)
- Critical information gaps on how to effectively control specific invasive species without damaging natives in the process (DiTomaso)
- Limitations on the types of control options available in different ecosystems due to geographical or topographical constraints or political or environmental restrictions (DiTomaso)
- Our behavior toward weeds, describing them as a problem, rather than recognizing them as a symptom for lack of biodiversity and/or lack of managing the ecological processes in a way necessary to prevent weed invasion (King)

Critical Information Gaps

We asked our respondents to share with us what they considered the most important gaps in our knowledge of weed prevention and control. While their answers were varied, and in some cases, reflected their backgrounds and current positions, there were several common threads.

- Limited accessibility of information regarding management practices and weed control techniques is a major constraint to effective weed control (Harris, Robertson).
- Accessibility of information could be improved by the development of a regional database, wherein managers could search for specific techniques, locations where they were applied, and how effective they were in controlling particular weed species (Harris).
- Lack of information on the movement of invasive species (Fulks and DiTomaso). As DiTomaso stated: "…we need to know what species to anticipate, [by] what pathways they are likely to be introduced, and how to effectively monitor their presence and mitigate against their introduction and establishment."
- How different management strategies influence different ecosystem components, how those components interact, which in turn, influences the "ecological trajectory" of weed control and the restored system (Harris, DiTomaso, King)

Major Regulatory Constraints on Weed Control

Our panel of weed control experts varied in what they view as the major regulatory constraints inhibiting effective weed control.

- Specific regulations such as those concerning herbicide use (Fulks) and "special-status" species (Robertson) that can impede weed control programs
- Frequent delays in the decision-making process regarding a weed control program (DiTomaso). Delays allow invasives to establish and spread, "…ultimately require(ing) increased costs, greater economic and environmental damage, and eventually more herbicide use than would have been necessary if the problem had been addressed at the onset."
- Mismatch between a regulatory agency plan and the situation on the ground (Harris)
- Finally, King responds that he would phrase the question differently. "It isn't regulatory constraints that prevent or inhibit effective weed control; it is lack of ecologically sound constraints in the global transportation and introduction of all forms of life, purposefully or accidentally." He takes the view that regulations were and are needed to control exotic species' introductions in the first place.

Current State of Funding for Weed Control Efforts

All experts agree that state and federal agencies are allocating far less money to weed management and research in the current economy.

- Declining research funds from industry as most herbicides are now produced generically (DiTomaso). Fewer funds has meant that fewer projects can be started, and less money can be allocated to the monitoring and maintenance of existing projects to ensure their success (Robertson).
- To combat the funding challenge, some agencies (Robertson) and research groups (DiTomaso) are creating and looking toward new sources of funding. For example, groups are working to establish an innovative interagency co-op system, where agencies would each contribute a relatively small amount of money toward research projects, and then they would be able to collectively choose which projects to fund that best meet their needs (DiTomaso).
- Agencies will increasingly have to rely on funding from local governments, landowners, and private funding sources to fund weed management projects (Robertson). This is anticipated to result in less coordinated weed management in many areas.

Success Stories and Hopeful Lessons

Weed control is a daunting task facing grassland managers. It would be easy to become discouraged by the difficulties of long-term weed control. However, all of our respondents had positive messages to share about how weed control is possible, even given the current constraints and challenges. We asked the experts to share a success story they are familiar with and what they felt the lesson was for weed management as a whole. We end with

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highlights from their stories, which could surely be articles (or books!) unto themselves.

Gillies Robertson. Following 4 consecutive years of treatment with the chemical Imazapyr, we had successfully killed a 20-acre stand of salt cedar (*Tamarisk parviflora*). We then removed the dead plants by burning them in piles and subsequently seeded the 20 acres with a native grass seed mix and planted over 200 plants. This site was successful due to the persistent and ongoing treatment of the tamarisk and a great amount of community and landowner collaboration. With no funding for ongoing maintenance and weed control, we are relying upon the dedication of the people involved to volunteer their time to keep up that work. It remains to be seen whether the planting will prevent re-infestation, but through the work of the landowner and other interested parties, it stands a really good chance.

Andrew Fulks. The Russell Ranch grassland mitigation area would be considered successful in this regard. What made it successful, and the lessons learned, include:

- Do a year of chemical and mechanical weed control prior to seeding. If you can, have it clean-farmed prior to that. Our easiest sites are those that were commercially farmed for years prior to our work.
- Have the property be under the stewardship of a person with background in maintaining natural areas.
- Develop a master plan for management of the site.
- Respond to weed issues promptly, rather than letting them get out of hand and trying to control them later.
- Don't give up on a site. It takes years of management before you can really see the natives established.

Dave Harris. My 6-acre project that is now nearing completion is a success story so far. We implemented a front-loaded exotic weed control approach, where we utilized large-scale weed eradication techniques such as solarization and disking to carry out approximately 2 years of grow kills before introducing any natives. This created a situation where once we introduced natives they had much less competition to begin with, and we weren't obligated to nearly as much expensive fine-scale weeding.

Richard King. [My success stories] revolve around building biodiversity in the soil by changing conventional management. That means great[er] soil cover, managing for plant vigor, managing for diversity of vegetative cover and all forms of related life, introducing species where no inoculation source is likely to occur for a long time, mimicking natural disturbances necessary for effective nutrient and water cycles, high solar energy flow, and the desired community of life, and doing all this profitably 365 days a year while having fun in the process.

Joe DiTomaso. Other excellent examples are with various biological control programs. Biological control is not fully appreciated because it is difficult to see what has been prevented or how much money has been saved when the program works well. In an economic analysis in Australia, it was estimated that their biological control program, including successes and failures, has a cost benefit ratio of 23:1. This means that for every dollar they invest in biological control, they save 23 dollars down the road.

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Register now for Spring Workshops!
see pages 8-9

Front cover photo: Green hills at Helen Putnam Park near Petaluma. *Photo by Wade Belew.*

Back cover photo: We are looking forward to all spring has to offer. See page 8 for our spring workshop schedule!
Pictured here, *Deschampsia danthonioides* and *Lasthenia fremontii* at Jepson Prairie in April 2010. *Photo by Jennifer Hogan.*