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California Native Grasslands Association

Grasslands

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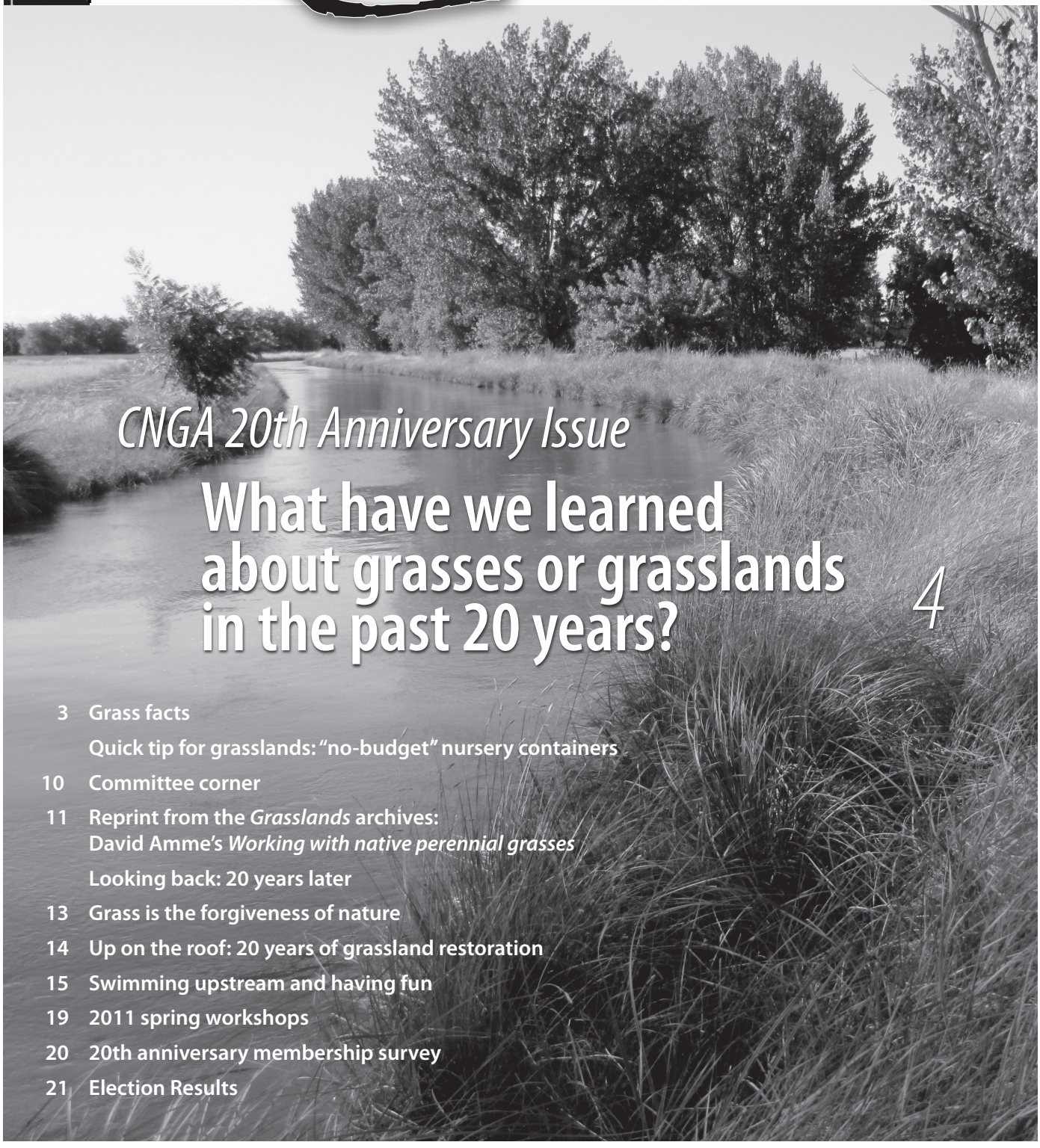

CNGA 20th Anniversary Issue

What have we learned about grasses or grasslands in the past 20 years?

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California Native Grasslands Association

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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.

For advertising rates and instructions, or membership and other organizational information, contact CNGA Administrative Director: **ADMIN@CNGA.ORG.**

For program information related to tours or training workshops, contact CNGA Administrative Director: **ADMIN@CNGA.ORG.**

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Grasslands Submission Guidelines

Send submissions to:
Editor: GRASSLANDS@CNGA.ORG.

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

All submissions are reviewed by the *Grasslands* Editorial Committee for suitability for publication.

Submissions are accepted electronically as e-mail attachments. Contact the editor for formatting specifications.

Submission deadlines for articles:
Spring 2011: Feb. 15, 2011; **Summer 2011:** May 15, 2011; **Fall 2011:** Aug. 15, 2011; **Winter 2012:** Nov. 15, 2011

From the President's Keyboard

Wade Belew

Reflections on the past year…

We all know how tough the economy has been on a lot of our jobs and budgets out there. My own project that I have been working on the last five years has a budget of about a third of what it was averaging in years prior. A lot of nonprofits are feeling the pinch, too, but CNGA keeps moving forward.

Why? We have a great Board of Directors that keeps an eye on the bottom line and keeps the organization financially viable. We're a "lean and mean" organization without a lot of fat to trim in the first place. And while the economy is down, the interest and enthusiasm for native grasses and grassland management only continues to rise. We offer quality programs and a top-notch publication that you're reading right now that slake the thirst for knowledge and inspiration of those engaged in managing and restoring these valuable ecosystems.

Our workshops continue to be an important part of our program, helping us fulfill our mission and supplement our budget at the same time. Bryan Young has done a great job as chair of the Workshop Committee.

I want to thank Jim Hanson for serving as Treasurer for the last four years. He has kept a sharp eye on the books and always has thoughtful insights. Jim has also been Chair of the Advocacy and Collaboration Committee, and I would only expect to see him focus his attention on those efforts more in the coming year. Sara Sweet is offering to move from Secretary to Treasurer, so we shouldn't miss a beat (or dollar).

I also want to thank outgoing Board members David Amme, Clare Golec, Sarah Hoskinson, and Christina Smith for their service to CNGA. Several have offered to stay on as committee members, so their contributions of time and energy will continue, and will continue to be appreciated.

I can't end the year without a big "thank you" to Judy G-Scott, our Administrative Director. Her hard work and dedication are appreciated beyond words!

One decision the Board made as a concession to the economy is that we will not have a conference or symposium in 2011. We decided it made more sense to focus on our workshops, which are more affordable and offered at different locations around the state. The good news is this will give us a year and a half to plan for a stellar conference in 2012.

In case you happen to get a new digital camera for Christmas and are looking for an excuse to put it to work, remember to take pictures of grasslands and grasses in the coming year. In the next issue of *Grasslands* we will be formally announcing our 20th Anniversary Photo Contest. It will open in fall 2011, with the results on display at our 2012 conference. There will be modest prizes, and your photo may be used in CNGA materials to promote what we all love, California grasslands!

Grass facts: *Quick bits of information about our favorite subject*

- Grasslands comprise roughly 20 percent of the vegetation cover on earth.
- Grasses can be found on every continent, including Antarctica (approximately 11,000 species and 800 total genera).
- Grasses are of great economic importance (wheat, rice, maize, millet, sorghum, sugar cane, forage crops, ornamental, weeds, thatching, weaving, and building materials).
- Grasslands comprise roughly 10 percent of the vegetation cover in California.
- Historically, California native grasslands were rich in native wildflower species.
- California native grasslands have co-evolved with native wildlife and are important forage and habitat for wildlife.
- Many native perennial bunchgrasses are long-lived; purple needlegrass clumps can be at least 200 years old, and some live as long as 1,000 years.
- Approximately 25 percent of California's natural vegetation remains relatively unchanged, with less than 1 percent remaining as intact native grasslands.
- The grass family (Poaceae) is California's second most diverse plant family, after the sunflower family (Asteraceae).
- Native grasses represent 4 percent (291 species) of the 7,402 vascular plant species native to California, and 37 grass species are endemic to California.
- There are 68 rare and uncommon grasses listed with California Department of Fish and Game's California Natural Diversity Database, and California Native Plant Society's Inventory of Rare and Endangered Plants.
- Of the 233 nonnative grasses in California, 19 percent (44 species) are listed as invasive by the California Invasive Plant Council's Invasive Plant Inventory.

Quick tip for grasslands: *"No-budget" nursery containers*

Wade Belew, *CNGA President*

When I first became interested in native grasses I had more ambition than budget. We had been planting trees and shrubs for several years as part of an urban stream restoration project, and I wanted to add an understory. First, I just wanted to grow a small quantity of grasses, just to learn more about them and have enough to plant out a demonstration plot. I did have a place to grow in our modest nursery, potting soil, old one-gallon containers, and some local seed on site.

I knew that small containers like cell tubes were more desirable for greater productivity and ease of planting. But I didn't have any, nor a budget to buy them. One-gallons would usually be considered overkill for a container, but they are free and offer one big advantage; they don't need to be watered as much as a smaller container. I didn't have an automatic watering system for our nursery.

One-gallon grasses can be split with a shovel for planting, but that can be hard to do and even dangerous trying to slice a round object in half. It is also hard on the plant, severing roots and all. So I came up with this idea to divide up the one-gallon pot into smaller compartments. I took pieces of cardboard and cut two that could slip together and inside the one-gallon pot to create a divider that made four compartments (like inside a wine case). Like the more desirable restoration containers, the compartments are tall and narrow, encouraging vertical root development, instead of the swirling roots typical in a round pot.

The four compartments can be filled with soil and planted with seed as you would any other container. If you have used cardboard for sheet-mulch weed control you know it will last about six months or so before starting to break down. When the time comes to plant out, the four quarters separate easily when they slide out of the pot. You end up with four plants instead of one, and the holes don't have to be dug as big as they would for a full one-gallon pot.

This is a great project to do with volunteer or student help and shows a reuse/recycle example.

Wade is the Stewardship Coordinator for Cotati Creek Critters, a grassroots citizens' group working to restore a section of Laguna de Santa Rosa that runs through Cotati and a small section of Rohnert Park.

CNGA 20th Anniversary

What have we learned about grasses or grasslands in the last 20 years?

CNGA members respond

For CNGA's 20th Anniversary, we asked our members what they have learned in the past 20 years about grasses or grasslands. Here is the first installment—if you would like to submit an answer to GRASSLANDS@CNGA.ORG we will be printing more answers in the spring issue.

If you submitted an answer but don't see it here, look for it in the spring issue. We got so many great responses we couldn't print them all in one issue. Thanks for your submissions!

Every copy of *Grasslands,* every grassland field trip, and every conversation with fellow grassland enthusiasts teaches me something new about grasslands. When I reflect on the past 20 years of my work with grasslands, a couple of very important concepts come to mind.

Grasslands are not just grasses. The diversity and vital ecosystem functions provided by our native forb community cannot be ignored.

Secondly, **grassland restoration requires patience and persistence. Do not give up on a restoration project after the first year.**

Stick to your plan, battle your weeds, and enjoy the surprise success of the second year…sometimes third year.

—Bryan Young, Natural Resource Supervisor, Sacramento Regional County Sanitation District, Bufferlands; CNGA Board Member

Hunter Wallof, Design Associates Working with Nature (DAWN), collecting *Bromus carinatus* and *Melica californica* on UC Berkeley property in the Berkeley Hills, 1984. This pristine hillside is now dominated by Italian thistle. *David Amme*

Ongoing maintenance is critical. There is a misconception that native grasslands can be walked away from after a year or two, and they will maintain themselves indefinitely. Although this can be true in some cases, **there are so many external pressures on native grassland systems, including weeds and nutrient inputs, that some level of ongoing maintenance can often differentiate a successful project from an unsuccessful one.**

In many cases, performing a timely mow, graze, burn, or selective herbicide treatment can greatly improve even a mature native grassland. I have seen 7-year-old grassland restoration projects becoming decadent with medusahead in the understory. And these are grasslands that are well established with native grasses. In these cases, coming in with a prescribed burn, or a timely graze, can really make a big difference.

It may not be necessary to manage the grassland every year, but plan on performing some type of ongoing maintenance, as is needed, every couple of years. You will be able to tell the difference in your grassland restoration project.

—Jon O'Brien, Habitat Restorationist, Audubon California Landowner Stewardship Program; CNGA Board Member

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In the last 5 years, I have learned everything I know about restoration of California grasslands. While sometimes I feel like my brain is full, I am constantly reminded of how much more there is to learn!

One of the biggest ideas I have come to understand is the **seasonality of grassland restoration, how each season brings a specific set of tasks.** I've learned that **pre-planting weed control is key—ideally starting in fall a year or more before planting.** Exotic annual grasses produce seed so prolifically that depleting the soil seed bank as much as possible that previous fall/winter (using herbicides) and spring (timed mowing) before you plant is necessary.

Then, **the summer before planting, you should gather your site preparation and seeding supplies:** what species do you want, and at what ratio? How much seed will you need and where are you going to buy it? How are you going to prepare your seedbed, and how are you going to plant your seed? What tools do you need to complete these tasks?

Get ready for the busy fall season. If you are going to **disc** the area to be seeded, do that in early fall. When the fall rains come and weeds germinate, do **one to two last rounds of weed control before you plant your seeds** (usually this means using Roundup to kill all germinating plants). Remember that every time you till the ground, you are bringing more weed seeds to the surface (so that if you till after you've done your last herbicide spray, you're going to get another flush of weeds!).

Once the soil is thoroughly moist (usually in November, but it depends on the year), **plant your seeds, and hope for rain.** After that, you will need to manage your planting, maybe with broadleaf weed control or timed mowing.

Mow in winter (January or February) **to allow light to reach the very short native grasses**—they won't be very tall because they use a lot of energy growing large root systems. **Mowing again in late spring** (May or June), after nonnative annual grasses have committed to setting seed but before the seed has ripened, will "cut their heads off," which keeps that seed from ripening and reduces nonnative annual grass growth.

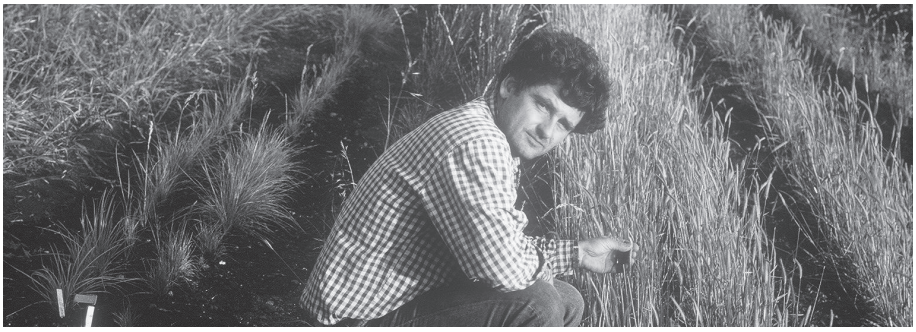
Once summer comes around again, your natives should have established root systems so that they will go dormant and survive the dry summer months until the next wet season. **It all starts again with each new project and each new year.**

I've been lucky to have been a part of many grassland restoration and revegetation projects in my short career, and know that there is still much to learn and experience as a restoration ecologist—**each project is different and an adaptive outlook is crucial when participating in the activities each season brings.**

—Liz Goebel, Hedgerow Farms; CNGA Board Member; Grasslands Editorial Committee Chair

Restoration is a highly evolving science. It is a collaborative process between local academics, applicators, agency personnel, land managers, and landowners, who come together to create a sustainable habitat for the diverse flora and fauna of California. **I have come to appreciate the important link between short-term and long-term management of restoration sites, and the various criteria in which we consider a site successful.** I realize that it is a delicate balance of incorporating the various political, biological, and regulatory interests, current multidisciplinary knowledge, a realistic plan for today's altered environments, limitations of funding, and above all, luck of the weather.

—Catherine Little, Preserve Manager, Northern California Center for Natural Lands Management; CNGA Board Member



David Amme tending the first native grass R&D garden along the Big Sur coast near Gamboa Point, 1985 *Paul Kephart*

Design Associates Working with Nature (DAWN) native grass propagation hutch, 1984 *David Amme*

WHAT HAVE WE LEARNED? continued on page 6

WHAT HAVE WE LEARNED? continued from page 5

In grassland restoration, regardless of how difficult it can be to get the right seed into the right ground at the right time, it is equally challenging to ensure that establishment persists over time.

Hundreds of years of de-evolution of our natural grasslands cannot be overcome overnight. It will take people who are willing to keep watching, doing, listening, and sharing unselfishly the things they learn for a common good.

I find CNGA today as I did almost 20 years ago—full of knowledgeable individuals from a broad spectrum of backgrounds and mindsets who share a common belief that California native grasslands are beautiful and that they should be preserved, enhanced, protected, and enjoyed. Bravo!

—Erik Gantenbein; Board Member, CNGA

Restored high salt marsh with *Distichlis spicata, Castilleja ambigua* ssp *humboldtiensis,* Humboldt Bay National Wildlife Refuge, May 2008 *Andrea Pickart*

Hedgerow Farms Field day, 2009. Participants learn about the pollinator plots from John Anderson (far right). *Andrew Fulks*

WHAT HAVE WE LEARNED? continued from page 6

Calochortus sp. *Richard King*

The thing I learned after planning, implementing, and managing dozens of native grass related restoration/habitat creation projects is that there was a point about five years ago where **I had a strong and clear feeling that I had it figured out. That feeling quickly went away and has never returned.**

—Chris Rose, Solano Resource Conservation District; past CNGA Board Member

Pacific Coast Seed Company opened in 1985 with backing from S&S Seed Company, which already maintained an extensive inventory of Southern Californian shrubs and wildflower seed. Many S&S Seed projects included a broad selection of such native shrubs and wildflowers but few, if any, native grasses. Straight shrub seeding jobs performed reasonably well; mixes including "annual grass" recruited few if any native shrubs or flowers.

Although these Californian shrub and wildflower seeds saw some crossover use in Northern California, mostly in the Sierra and on the coast, they were usually less available up North and used far less often than in the South.

Then-current seeding culture in Northern California utilized Soil Conservation Service varieties of Western U.S. and cosmopolitan grasses, such as wheatgrass and hard fescue.

Many sites were seeded to "naturalized" *Bromus hordeaceus* and an annual fescue of dubious native provenance. **While urbanized short-term erosion control projects sometimes still use the Mediterranean brome and Zorro fescue, the seeding palette has switched predominantly to bona fide native grasses, shrubs, and wildflowers originating in Northern California.** What we have learned and how things have changed!

At its inception, CNGA was full of enthusiasm and growth was strong—even my mother joined! CNGA experienced the usual growing pains as the Directors were all volunteers and had to juggle CNGA activities with their other business and personal responsibilities.

The earliest Boards produced amazing but uneven results as some people got overextended or just burnt out. Serving as the commercial liaison on several early Boards, I worked to establish a fair system such that vendors could display their products at various CNGA functions and the Association could generate a little revenue to offset the cost of the events.

Some 10 years after CNGA's inception, paid staff was retained, a commitment that helped formalize CNGA and ensure a more institutionalized memory. As a corporate member, Pacific Coast Seed continues to support the work of CNGA and hopes to stay involved with the Association for another 20 years.

—David Gilpin, Pacific Coast Seed

David Riggle, inspecting mature flowering purple needlegrass and Molate fescue inside the DAWN Living Laboratory, Berkeley, circa 1985 *David Amme*

We've learned that it's possible to use livestock to manage weeds within grasslands, if carefully monitored and managed. *Andrew Fulks*

WHAT HAVE WE LEARNED? continued on page 8

WHAT HAVE WE LEARNED? continued from page 7

The short answer to that question is: almost everything I know about grasses! I managed to get through graduate school with only a minimal working knowledge of this very important group of plants. **Because grasses are difficult taxonomically, they are often underemphasized in biology/botany/ecology curricula, yet they are such a huge player in our global ecosystems.** Kudos to CNGA for being one vehicle for raising awareness.

My own experience with grasses and grasslands has focused on coastal ecosystems in California and the Pacific Northwest. I have learned the "hows" and "whys" of eradicating invasive grasses and restoring native species. I have shifted my attention as a restorationist away from the relatively easy task of ridding dunes of European beachgrass to the more ecologically subtle challenge of dealing with invasive annual grasses in dunes and the much more technically demanding task of ridding our North Coast estuaries of *Spartina densiflora*. I've learned that *Spartina* biomass is not necessarily a predictor of ecosystem productivity in salt marshes, and that the steep, narrow foredunes created by *Ammophila arenaria* provide less shoreline protection than our native nearshore dunes supporting *Leymus mollis* and *Poa macrantha*.

In short, I've learned that **our native grasses provide much more in the way of ecosystem "services" (even from a human-centric perspective) than those that were intentionally introduced specifically to increase those services.**

I've learned to appreciate the subtle beauty of grasses and grasslands as well as the disproportionate role that many grasses play as ecosystem engineers.

Finally, I've learned **how little we still know and understand about the intricacies of grassland ecology,** even as the massive ecological change we are now experiencing is moving the target of our understanding.

I am no longer in a position to base my understanding of conservation so heavily on the knowledge gained over the past 20 years, and I am approaching the latter part of my career with an open mind.

—Andrea Pickart, Ecologist, Humboldt Bay National Wildlife Refuge

Poa macrantha, **Lanphere Dumes, Humboldt Bay National Wildlife Refuge, June 2008** *Andrea Pickart*

WHAT HAVE WE LEARNED? continued from page 8

Field Day at Hedgerow Farms, 2009 *Andrew Fulks*

I came to CNGA while employed at Pacific Coast Seed Inc. following too many back-breaking years in the landscaping and nursery industries, all the while a card-carrying member of CNPS. Laboring in strictly applied horticulture, I had acquired a broad working knowledge of plants in the gardening trade and, along the way, developed a sense of how people connect with plants around their homes and in the wild. Yet it was while pursuing the sales and marketing of seeds in Northern California that I was exposed to a wider array of the region's *native* plants and especially its grasses; participation in CNGA's workshops, field trips, and conferences effectively became the vehicle for my continuing education.

Among the virtues of my immersion in CNGA, first as an active member, and then, with generous support from Pacific Coast Seed, during a 2-year stint on the Board of Directors, I understood how "name brand" cultivars in the ornamental plant business ultimately derive from plants native *somewhere*. With access to ecological as well as taxonomic information, I came to apprehend how **the condition of California's native grasslands epitomizes a situation crying out for significant re-perception of our engagement with the natural world of the Western States.**

The evolution of my own career at Pacific Coast Seed was increasingly influenced by this new and continuing "enlightenment" about **the value of these grassland ecosystems particular to California and their relevance to fundamental webs of life.** If "to promote, preserve, and restore the diversity of California native grasses and grasslands ecosystems *through education*…." is part of CNGA's mission statement, then I can lay claim to being one grateful beneficiary.

—Peter Boffey, Horticulturist; past CNGA Board Member

There is so much more to learn, protect, and restore. Settling over 20 years ago in northwest California, I have wandered in the Coastal Foredunes with American dunegrass, Coastal Prairies and Marshes with California oatgrass and California hair-grass, Redwood Forest with vanilla grass, and Pine and Oak Woodlands with majestic bunches of California fescue.

Unfortunately, **I have also observed these beautiful, ubiquitous, and expansive grasslands and woodlands of native grasses and wildflowers disappearing and degrading across California due habitat loss and invasive weeds.** These years have been a wake up call to heed these "other beings" of our world.

To cherish what remains of the Earth and to foster its renewal is our only legitimate hope of survival.
–Wendell Berry

—Clare Tipple Golec, Field Botanist; past CNGA Board Member

The most important thing I've learned is that **you can't judge a grassland by its cover!** At first glance, some sites that seem dominated by only a few grasses may reveal upon closer inspection up to 50 species in only 100 square meters.

As I've learned to recognize the numerous lilies, clovers, and teensy-intsy-aceae that flourish in these habitats, I have fallen in love with the diversity and the mosaic of colors.

The most diverse grasslands are not always a showy splash of color. To see the true character of an area, you've got to be willing to get down on your hands and knees… and don't forget your hand lens!
—Jennifer Buck, Vegetation Ecologist, CNPS

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WHAT HAVE WE LEARNED? continued from page 9

I've learned that **after restoring subalpine grasslands, they need to be continuously monitored and managed.** If your restored grasslands are surrounded by annual exotic grasslands, there will be continuous invasion pressure. On the other side, I've learned that **while much of our remnant grasslands have been invaded by annual grasses, there are still substantial pockets of native grasses within undisturbed areas.**

—Andrew Fulks, Putah Creek Riparian Reserve Manager; CNGA Board Memeber

Grasslands often hide their true diversity from the casual observer. This factor has lead to their underappreciation, even among biologists. For most of the year, to the untrained eye many of the grasslands that I have had the pleasure of spending time around appear to be monotypic stands of one type of grass or another. This is very rarely the case.

At the Santa Rosa Plateau in Riverside County, there is a rich diversity of native wildflowers, and more than one-third of the grass one sees is native. Unfortunately, one must visit these areas multiple times throughout the year to witness the early gems like the chocolate lilies, followed by the display of blue-dicks, which are not to be outdone by farewell-to-spring a month later. The tarplants finish off the growing season and in a year like this year can flower into the fall.

From afar one will miss many of the later displays as the non-native grasses will have grown up over the native wildflowers. But don't be fooled, the wildflowers are there in amongst the grasses. They just need to be found.

—Zachary Principe, Ecoregional Ecologist,The Nature Conservancy; CNGA Board Member

Committee Corner

Development and Outreach Committee

This issue's Committee Corner has particular relevance because the recent membership survey generated a lot of ideas for program expansion (see page 20). The Board of Directors will need help to realize this. Remember, any member of CNGA can sit on a committee, and contributions of all sizes are welcome!

The Development and Outreach Committee's overarching goal is to grow CNGA through enhancing programs and membership. Historic tasks within this committee include member outreach, website maintenance, brochure and display design, and grant writing. With additional member involvement, accomplishments could rise to a new level. This is the committee for people who like to spread the word about CNGA and who have ideas about new CNGA programs.

Our most recent endeavor was the membership survey. Thanks to everyone who participated! The survey revealed three opportunities for improvement that have particular relevance to the Development and Outreach Committee. First, members commonly requested better inclusion of southern and far northern California. Second, many expressed a need for more outreach, both to professionals and the general public. Third, satisfaction with the website is low. The Development and Outreach Committee plans to address these issues in 2011, along with completing two projects in progress: the design of a new tabletop display for use at conferences and the submission of at least one grant proposal.

Your help can boost the success of CNGA's outreach. Examples of ways to help include:

- E-mail us ideas on topics to include in public outreach.
- Provide written text for use in public outreach materials such as pamphlets, flyers, or oral presentations.
- Submit photographs for use in outreach materials.
- Write a grant proposal to support the development of new educational tools.
- Offer design services for the new tabletop display.
- Propose specific topics for inclusion on the website.
- Present CNGA's existing PowerPoint presentation on California grasslands to a local group.
- Staff a booth with CNGA's tabletop display at a local event.
- Introduce the CNGA Board to grassland experts in southern and northern California.
- Write an article for the *Grasslands* journal about a current topic of interest or debate in southern or northern California.

As you can see, the opportunities vary from a single e-mail to substantial involvement. If you feel motivated, call or e-mail the chair of the Development and Outreach Committee, Sara Sweet, at 916-683-1767 or SSWEET@TNC.ORG.

WORKING WITH NATIVE PERENNIAL GRASSES

David Amme

One thing which a good farmer quickly learns is that in fighting nature he will always be defeated but that in working with her, he can make remarkable and immensely profitable progress.

—Louis Bromfield, Malabar Farm

Designers, landscape architects, planners, and land managers are seeking solutions to the challenging and difficult problems of slope stabilization and erosion control, noxious weed invasion, habitat mitigation and restoration, fire hazard, sustainable production, and the dwindling water resources. It is the designer's fondest dream to create a stable landscape that requires little or no maintenance. Indeed, the closer the landscape design approaches the potential natural vegetation, the more stable that landscape is. The restorationist learns that by working with or following the natural process of vegetation establishment less inputs and costs are required. As this awareness grows, more and more landscape architects, environmental consultants, farmers, and agricultural researchers are discovering the utility and benefits of native perennial grasses.

The fast and loose techniques of broadcast seeding and spray-on hydroseeding with exotic annual grasses and "native" wildflowers are not fulfilling long-range landscape goals. Annual grasses, especially Blando brome (*Bromus mollis*) and Italian ryegrass (*Lolium multiflorum*), grow quickly and efficiently exploit the soil moisture near the surface, making it difficult for perennial species to establish. Seeded wildflowers rarely persist past the first year. Annual and biennial weeds such as ripgut brome (*B. diandrus*) and yellow starthistle (*Centaurea solstitialis*) soon invade, increasing abatement problems and the potential for fire hazard. There is no "silver bullet" single species or seed mix for establishing a stable grassland landscape. Proper species selection, seed bank evaluation, seedbed preparation, seeding techniques, and especially post-establishment management are critical factors in attaining vegetation stability.

The Healing Grasses

Native perennial grasses have many applications in farm, urban, and wildland settings. Farmers are finding native perennial grasses useful in sustainable agricultural systems as low-input perennial hay crops, as cover crop plant material in orchards and vineyards, and as harbingers of beneficial insects. Drought-tolerant perennial grasses are ideal for transition areas surrounding high-use turf areas of urban parks and golf course fairways. Perennial grasses can be used in habitat restoration and creation settings, including open-space areas, woodlands, riparian corridors, and wetland margins. Native perennial grasses and associated native grassland community offer an alternative to the noxious weeds along the thousands of miles of the right-of-ways of the state's highways system. The faster-growing, short-lived perennial grasses have similar seedling vigor and growth rates to the exotic annual grasses and are useful in erosion-control mixes on disturbed sites and in reseeding areas burned by wildfires. One distinct advantage to using native grasses after fire and disturbance is that they are not so competitive that they eliminate the local native flora of flowering herb, shrub, and tree species and allow the surrounding native plant community to reestablish.

There are many different kinds of native perennial grasses in California. There are short-lived and long-lived perennials, both tall and short in stature. Some perennials spread by underground rhizomes, but most of California's perennial grasses are bunchgrasses. Many perennials die back completely in the summer regardless of summer water, and some will regrow with occasional supplemental irrigation. The majority of California's perennial grasses are the cool-season types. These grasses generally germinate in the fall, grow vigorously in the late winter and spring, and produce their seed by the end of May. Warm-season grasses grow in the

NATIVE PERENNIAL GRASSES, continued on page 12

Looking back: 20 years later

For CNGA's 20th Anniversary, the *Grasslands* Editorial Committee took a look at our archives. From the first *Grasslands* issue, printed in April 1991, we decided to reprint David Amme's article about the use of native grasses and the various species commonly used. Twenty years later, much of what David wrote still applies.

Accompanying David's 1991 article is a short list of native grass species that are now readily available for sale and were not available when David made his first list 20 years ago.

David wrote a follow-up article (*Grass is the Forgiveness of Nature*) about his involvement in CNGA and his experience with native grasses, which follows his original "vintage" article.

In the Spring issue, we will reprint Robert Bugg's vintage article about using perennial grasses on roadsides (also from the April 1991 issue), along with an update by Robert revisiting that same topic.

NATIVE PERENNIAL GRASSES, continued from page 11

late spring and summer and flower in fall. The most important warm season perennial grasses in California are the alkali sacaton (*Sporobolus airoides*), deergrass *(Muhlenbergia rigens*), saltgrass (*Distichlis spicata*), and prairie threeawn (*Aristida* spp.).

The 1991 Perennial Grass Portfolio

The interest in native perennial grasses has led to the production, albeit small, of several species and varieties. The following native perennial grasses are currently being produced in commercial quantities and can be purchased from seed houses in California. These species are a "short list" of over eighteen native perennial grasses currently being reviewed by the California Native Grass Association.

Meadow Barley (*Hordeum brachyantherum*). Meadow barley is a medium-sized, short-lived bunchgrass with strong seedling vigor. Meadow barley can be found in meadows, bottomlands, salt marshes, and on grassy slopes from sea level to 7,000 feet where rainfall averages from 12 to 36 inches annually. It is tolerant of alkaline soils and will establish on infertile and compacted sites. Generally, meadow barley will not persist on dry sites. Because of these characteristics, meadow barley is an ideal nurse crop with other long-lived perennial grasses.

California Brome (*Bromus carinatus*). California brome is a large, leafy, short-lived bunchgrass with strong seedling vigor. It grows in woodland sites throughout California that receive between 12 and 40 inches of rainfall per year. California brome is a very productive grass on fertile sites and provides good groundcover for wildlife and waterfowl. It is an excellent, general-purpose grass that is very competitive with herbaceous weeds. California brome is quite variable throughout its range. There are varieties that are annual or biennial (*B. arizonicus,* Cucamonga Brome). Mountain brome (*B. marginatus*), which is sold under the name Bromar, is similar to California's brome. Bromar is adapted to the mid-elevational mountains of the Northwest. Deborah Brome (described as a P.V.P. "native type" *B. carinatus*) is not a native North American brome but rather a long-lived South American brome developed in Great Britain for irrigated pasture and hay production. Taxonomically all of these grasses and their forms are difficult to distinguish.

Blue Wildrye (*Elymus glaucus*). Blue wildrye is a large, short-lived bunchgrass with good seedling vigor. Generally, blue wildrye is an upright, tall grass that inhabits woodland areas of the foothills and high mountains; however, there are more compact, leafy varieties adapted to sunny grassland habitats. Blue wildrye grows where annual rainfall ranges between 10 and 40 inches annually and is generally more drought tolerant than common meadow barley and California brome. Blue wildrye provides excellent wildlife habitat for both mammals and waterfowl. Blue wildrye is an excellent grass for reseeding burned and disturbed areas in the oak woodland and forested habitats. There are several varieties of blue wildrye presently available and adapted to different elevations and regions in California.

Slender Wheatgrass (*Agropyron trachycaulum* var. *majus*). Slender wheatgrass is a common bunchgrass in the higher elevational areas of the intermountain west. Variety *majus* is native to California's lower-elevation central and coastal valley region and is much more robust and faster growing than typical western plant material. Variety *majus* is very similar to blue wildrye in form and stature.

Creeping Wildrye (*Elymus triticoides*). Creeping wildrye is a tall, strongly rhizomatous perennial grass that grows on good soils and bottomlands from the coastal marshes to high Sierra valleys. Creeping wildrye is adapted to alkaline soils and is tolerant of high summer temperatures. It stays green longer into the summer dry season than any other cool-season perennial grass and spreads vigorously with underground rhizomes. With proper management, creeping wildrye will form large colonies and patches. Despite poor seedling vigor and delayed germination, creeping wildrye is competitive enough with weeds and annual grasses that it will dominate a properly seeded and managed site in the second year. The Soil Conservation Service is currently developing a variety of creeping wildrye (named "Rio") from material collected in the central San Joaquin Valley near Fresno. Seed is not available now but plants are available as cut rhizomes and liners.

Purple Needlegrass (*Stipa pulchra*). Purple needlegrass is a large, long-lived bunchgrass well adapted to clay and loamy soils. It grows primarily in the lower elevations between sea level and 2,000 feet in areas receiving between 12 and 30 inches annual rainfall. As with many of the long-lived bunchgrasses, purple needlegrass grows slowly as a seedling and is susceptible to competition from weeds and fast-growing annual grasses. When seeded, it generally takes two years to get a viable established stand. Fertilization during seeding generally favors the weeds and ultimately suppresses good stand establishment. Purple needlegrass is tolerant to summer drought and heat. Purple needlegrass will establish on disturbed cut slopes and in thin soils, making it an excellent perennial grass component in revegetation and restoration seed mixes. In addition, purple needlegrass is adapted to serpentine soils.

Nodding Needlegrass (*S. cernua*). Nodding needlegrass is often difficult to distinguish from purple needlegrass in the field. Nodding needlegrass is generally smaller with a finer leaf. It has strong seedling vigor, and is well adapted to sandy, well-drained, loamy soils.

Red Fescue (*Festuca rubra*). Red fescue is a medium-sized, loosely tufted, fine-leafed grass that spreads with short underground rhizomes. Many forms of red fescue have been introduced to California as turf seed. Hardy native selections of red fescue have recently been made along the central coast and in the mountain regions of

NATIVE PERENNIAL GRASSES, continued on page 13

Grass is the forgiveness of nature

David Amme

The California Native Grass Association was founded in the fall of 1991. The stated purpose of CNGA was to:

1. Promote native grass technology as needed to restore ecosystems,
2. Coordinate and support the production and marketing of commercial quantities of native grass seed,
3. Educate our communities on the economic and environmental values of native grasses, and
4. Endorse conservation efforts to preserve existing native grassland habitat.

The road to founding CNGA stretched back to a series of meetings held between the winters of 1990 and 1991, led by Bob Delzell of the Soil Conservation Service (SCS), now the Natural Resources Conservation Service (NRCS). Our first issue of *Grasslands* was published in April 1991. But the road stretched even further back when I brought the first large bag of purple needlegrass to Stewart Brother's Farm in Rio Vista. At the time, Scott Stewart was successfully growing SCS-developed Zorro fescue and Blando brome, and Berber orchard grass. Scott was eager to find new grasses, especially native California grasses.

The first bag of purple needlegrass and Molate fescue was collected by me, Hunter Wallof, David Kaplow, and Denise Martinez. We were a ragtag nonprofit restoration organization called Design Associates Working with Nature (DAWN)*. We started out in 1985 with some funding from the City of Berkeley to transform the Berkeley dump landfill site into an open space park. We didn't exactly succeed in this transformation. Today much of the area is dominated by kikuyu grass. Along the way we got hooked on the idea of using native grasses to restore this open space park. We couldn't find a grower who would produce native grasses. Bob Slayback, who worked for the SCS in Davis, suggested that I talk to Scott Stewart. You might say the rest is history. After some initial unsuccessful haggling in the Holland Ranch parking area, I slammed my tailgate and got ready to leave. Next thing I knew Scott cut a check, and I drove home along the levee roads with a shit-grinning smile that I just couldn't suppress.

Scott soon grew the "Big Three" (meadow barley, California brome, blue wildrye), purple needlegrass, and Molate red fescue. Scott had started ConservaSeed. By that time the SCS had developed the "Rio" form of creeping wildrye, and John Anderson developed the local valley form of slender wheatgrass.

What truly sparked CNGA were the open houses that Scott Stewart threw at the ConservaSeed Grass Farm at Holland Ranch near Rio Vista. He invited designers, landscape architects, planners, and public agencies to see the native grass fields and have a free Bar-B-Q lunch. After the initial years of ever increasing attendance at the ConservaSeed open house, we were all looking around and saying: "We need to start an organization and get things going."

Around this same time, John Anderson, an activist conservationist and veterinarian-turned-farmer in Yolo County founded Hedgerow Farms and began producing local central California native grass seed and developing sustainable native landscapes and hedgerows. Additionally, Victor Schaff at S&S Seeds began native grass production for Southern California ecotypes on his ranch in Los Alamos.

At first, the California Native Grass Association was focused on identifying, growing, and promoting native grasses. This has gradually expanded into conservation, restoration, management, and preservation of all the native grassland ecosystems of California. In the winter of 2005, CNGA was unanimously changed to the California Native *Grasslands* Association.

For me, it was an honor to be the catalyst, collector, and explorer for CNGA. It was nice reading what I wrote in April 20 years ago. We've all come a long way and there is still so much to do.

Many more native grasses are commercially available today. These include:

- Thingrass (*Agrostis pallens*)
- Squirreltail (*Elymus elymoides and E. multisetus*)
- Idaho fescue (*Festuca idahoensis*)
- Junegrass (*Koeleria macrantha*)
- California melic (*Melica californica*)
- One-sided bluegrass (*Poa secunda*)
- Small fescue (*Vulpia microstachys*)

*See photos on pages 4, 5, and 7.

Note from a CNGA founder

CNGA's contribution to ecosystem restoration and landscaping is real. In the early days when commercial quantities of native seeds were available, it was difficult to get buy-in by public agencies, park and refuge managers, the general public, landscape architects, etc. CNGA became and still is a major catalyst, teaching and promoting the importance and use of native grassland species. Almost all restoration projects now incorporate native grassland species as part of the plant palette. What was an initial vision and struggle has now become an accepted standard. CNGA has played a major role in making this happen. May the next 20 years continue to expand our influence.

—John Anderson, CNGA founding member and past President; owner of Hedgerow Farms

NATIVE PERENNIAL GRASSES, continued from page 12

California. Native red fescue is a very attractive ornamental grass that is aesthetically pleasing, whether mown or not. Its fine foliage and spreading character make it ideally suited to natural landscapes and low-input buffers.

Reprinted from the April 1991 issue of Grasslands (vol. 1, issue 1)

Up on the roof: 20 years of grassland restoration

Paul Kephart, *Rana Creek Nursery*

I was first introduced to native grasses and grassland ecology in 1991 when I met David Amme, John Anderson, and others to start up what was then called the California Native Grass Association. I was the first *Grasslands* editor, and I remember editing, producing, and paying for the first six issues. This contribution earned me a Life Member status. Wow! That small investment in time and energy resulted in profound professional and personal reward!

Green roof, California Academy of Sciences. Species list: *Festuca rubra, Festuca idahoensis, Fragaria chiloensis, Aster chiloensis, Erigeron glauca, Carex pansa, Agrostis capillaris* *Rana Creek*

Over the past 20 years, I have started up and managed two seed companies and two nurseries. I have studied grass systematics, ecology, horticulture, restoration, and grassland management. Native grass applications fascinate me and I evolved my practice to include ecological design, permaculture, landscape design, and architecture. Much of what I learned I could attribute to the enjoyable discourse and discoveries made with colleagues and friends in the Grassland Association. In particular Mark Stromberg, John Menke, Dave Amme, and I spent considerable time researching, growing, and restoring native grassland ecosystems. From this, a most enjoyable life-changing adventure has ensued; my pursuit and practice of living architecture.

Now, my wife Marta and I own and operate Rana Creek, which provides ecological design services, a nursery that specializes in native grasses and grass-like plants, and a landscape restoration business. We apply the principles and practices of restoration ecology to the built environment, namely green roofs, living walls, constructed wetlands, and sustainable landscapes. We have learned native grassland and meadow ecology is an appropriate analog for living systems when applied to modern urban architecture. Some examples include green roofs at the GAP headquarters, the California Academy of Sciences, and the West Elm Store. We restore diversity, functions, and processes to glass, concrete, and steel. Rana Creek has authored many grassland restoration and management plans and implemented projects in wildland and urban-interface areas, and now we enjoy working in cities and working on large-scale urban applications.

Grass fields at Rana Creek Ranch *Rana Creek*

Over the past 20 years, what I learned about grassland diversity, ecological functions, and processes has helped Rana Creek designers simulate and replicate habitat on rooftops and landscapes. We look at site- and structure-specific capacities to define how we reconnect corridors; provide essential life cycle needs of rare butterflies, birds, and plants; and beautify our communities. We integrate these living systems with architecture that results in greater resource efficiencies, less energy consumption, human health and well-being, and habitat renewal. This is a field of dreams and it's working! Research has shown greater insect and bird utilization on our rooftop projects than anywhere in surrounding ground planes.

The Grassland Association of professionals, academics, tradespeople, and ranchers has had a big impact on my life path and career. It's a great organization and I will continue to enjoy the company of its colleagues and friends.

Swimming upstream and having fun

Richard J. King, *CNGA Board Member*

Background

My comments focus on what I've learned about California Mediterranean climate annual grasslands from Alameda County north, although they seem applicable throughout the coastal, mountain, and Great Basin climate zones in which I've also been working. And I see no reason why they wouldn't apply in central and southern California, since I tend to focus on principles and trends.

I began focusing on grassland management and ecology in my first professional job out of Humboldt State University in Flagstaff, Arizona, as a Range Conservationist with the USDA–NRCS (formerly the Soil Conservation Service) in 1975. While in Flagstaff, I pursued a graduate degree and focused on wildland ecology. My passion was to understand how nature works so that land management could be improved. My thesis investigated and compared grazed and relict rangeland sites in the blackbrush formation at the Hualapai Indian Reservation and Grand Canyon National Park, which included various shrub, mixed grass shrub, and grassland sites.

I returned to California in 1982 as a range specialist in Red Bluff, assisting NRCS offices from Livermore north. In 1990, my family moved to Petaluma where I grew up, and we have managed 40 acres of grassland since 1991, 30 acres of which had been dryland farmed for several generations by my family to produce oat hay. The California range profession I joined in 1982 believed that the introduced Eurasian annuals outcompete California's native perennial grasses and forbs, and efforts to bring perennials back had failed. In more recent years, some believe substantial portions of our annual grasslands may never have been perennial grasslands or may have had only small patches of perennials.

Here is what I'm learning by observing my own grasslands and grasslands throughout northern California that I'm enjoying, whether it be the grass, the earthworms, the whitetailed kite, or the pocket gopher:

Restoration and reality

The number of introduced species in our grasslands, in all forms of life—not just plants, is enormous. It will never be possible to restore native grasslands to anything more than a semblance of what may have been because so many species have become naturalized and embedded in the fabric of grassland life. I prefer to view the idea of grassland restoration as managing toward grasslands still rich in native species without presuming the goal of restoration can be anything more than that. Change, including extinction, is a law of nature for individual species and communities of life.

Competition

The only serious competition I find between annuals and perennials is for sunlight. At the perennial seedling stage, annuals typically grow far more rapidly. If you spread the annual canopy after it gets about 6–8 inches tall or more, you will see the lower portion of their stems and leaves are yellow because of inadequate sunlight. Most native perennial grass seedlings grow slower and are subject to being shaded by the annuals, killing seedling perennials. Studies in 1944 by R.M. Love at UC Davis found that early spring grazing increased the survival of needlegrass and Harding-grass seedlings.

The other enemy of successful perennial seedling growth from shading is excessive litter from the previous growing season, whether standing or lying down and very thick. Seedlings need sunlight for photosynthesis. Even our exotic annual seedlings suffer from excessive thatch. And full-grown perennial grasses and forbs can be shaded to death from old thatch. Grasslands didn't evolve without herding animals that graze or trample old growth.

Some perennial grasses can live a very long time. Even a low rate of successful perennial seedling establishment will win the successional war with annuals in the long term. In the fall, perennials are often seen greening up before annuals have even germinated. Perennials have a head start

A vernal pool on the outskirts of Redding *Richard King*

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on annuals once the seedling survives the first summer. They only need to successfully develop three to five leaves to survive the summer drought. Having worked in Arizona for 8 years, I learned that 6 months without rain is definitely not a drought that is likely to prevent perennial grasses from successful seedling establishment.

Research shows annuals extract soil moisture much more completely than perennials, making it difficult for other species, such as perennial grasses, to successfully develop a root system through that dry zone. I don't doubt the research. I doubt the interpretation that perennials (or oak seedlings) are prevented from successfully establishing due to competition for water when we average a 4–6 month growing season and only need a tiny plant with three to five leaves to develop adventitious roots that can survive the summer drought. I have seen young perennials successfully invading into well managed annual grassland—both in very productive annual grassland and in sites with low productivity.

I'm not saying competition for moisture between annuals and perennials isn't occurring. I'm saying it is overrated as a reason why perennials aren't more successfully reproducing and spreading within our annual grasslands.

Invasives

We think of invasive species as problems. Yellow starthistle invaded loamy soils on the 30 acres where I built my house in 1991 and then stopped the continuous family hay farming. Tarweed increased greatly on the clay soils. (I can't call tarweed invasive because it is a native species.) My wife and kids hated walking out through the pastures. After 6–8 years my wife asked me why the starthistle wasn't as bad. It had dramatically diminished to relatively small and less dense patches. It disappeared in many places. Why? Same story with the tarweed. Why?

On the 10 acres that had not been dryland hay—just annual grassland for the most part—very few starthistle plants have existed since 1991, yet I manage all 40 acres with the same planned livestock grazing. Why didn't yellow starthistle invade that 10 acres too? Same story with the tarweed. Why didn't tarweed invade/increase in that 10 acres?

Medusahead has been steadily spreading on the old cropland with more patches developing and slowly enlarging over the years. Why? Some of the patches have shifted from a thick monoculture thatch to a patch with much more species diversity over time. Why?

Some perennial grasses can live a very long time. Even a low rate of successful perennial seedling establishment will win the successional war with annuals in the long term.

On the 10 acres managed as pasture for many decades, very few patches of medusahead have developed. And they are rich in species diversity compared to the old cropland patches. Why?

Many fenceline contrasts, roadside contrasts, and patchiness of invasives in northern California suggest to me that invasiveness is relative. On my own property, I'm convinced the invasiveness is far less or is nonexistent on the sites with higher soil biodiversity. I'm seeing similar evidence everywhere: invasives are not always invasive, yet we hate them with a passion and spend inordinate amounts of time and money trying to battle them. But are they a causal problem of the "competition" we think we are seeing with other vegetation, or are invasives simply the effect of soil biodiversity loss due to the past management of land? I think the latter is very often the case. Too many areas have not been invaded despite the invasive seed raining down on it every year. We have done a very poor job seeing that reality and seeking to understand why invasives are often not at all invasive.

Biodiversity

This is the least understood and appreciated foundation of our California grasslands; it is also true for our grassland restoration efforts. While we tend to focus our attention on nonnative invasions, the competition with natives, and keeping adequate residual dry matter on our annual grasslands grazed by livestock, the real issue we have largely ignored is biodiversity. There is far more to biodiversity than our remnant native plants and animals that we seek to protect or restore. Why do I say that?

There are more species of life in a shovelful of garden soil than aboveground in the Amazon forest—one of the most biologically diverse parts of earth. The diversity of life in soil is also as complex as the biodiversity found in the world's great coral reefs. Most soil microbes and life have not even been named or identified, let alone do we understand the complexity of their interrelationships. The complexity of life in that underworld is simply mind-boggling, and research has barely begun to explore the world beneath our feet.

Klamathweed (St. Johnswort) is an example of the importance of understanding the role of species complexity and relationships in grasslands. It invaded and devastated grasslands in much of northern California until scientists introduced a tiny beetle that disrupts the amount of healthy seed produced. Klamathweed is still present but no longer threatens grassland biodiversity. The incredible ripple effect through grassland environments infested with the weed occurred by increasing biodiversity by adding only a single new species—a tiny species of beetle.

I see the similar ripple effects on my own property where invasives like yellow starthistle and medusahead may persist in some areas in small amounts, but

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monocultures of them have dissipated over time while soil organic matter (i.e., carbon sequestration) and biodiversity is improving on my family's former cropland. It beg's the question: "Are such invasives problems or merely symptoms of the loss of soil biodiversity?"

I believe there is great evidence that our soil organic matter and soil biodiversity in much of California's annual grassland was variously depleted long ago when attempts at farming occurred. Abandoned farming has been followed by what I would call conventional annual grassland grazing management, where the management focus is only on leaving adequate residual dry matter—the mantra of the California range profession.

A small relict area on my property has road cuts on two sides of it, creating an island. It may well be an area that was never farmed. It is excessively drained yet very rich in native perennial forb and native perennial grass species as well as typical nonnative annuals. The grazed side of the boundary fence is rich in native species; the roadside that hasn't been grazed or disturbed for many decades has fewer native species and is dominated by only one native perennial species.

In the vicinity of the relict area, some native perennials spread more quickly than others. Some are not moving outward at all. I cannot help but think the reason may be that soil biodiversity, the level of succession of life in the unfarmed soil, may explain much of what I have observed. Given the loss of soil organic matter and the soil biodiversity dependent on it in the surrounding dryland farmlands, I have no idea how quickly (or slowly) successional changes below or above ground might occur as perennials variously invade well-managed annual grassland. The complexity is far too great to do more than wonder, monitor great detail for the long-term, or invite research.

Are invasives increasing and rare species threatened because biodiversity continues to decline in California grasslands, with the exception of the land conservationists actively striving to build stability and land health? I don't know, but I think it is a fair question. We know so little about how to monitor biodiversity in a practical way. Is soil organic matter the most practical tool available for everyone managing grasslands to monitor soil biodiversity?

Management

Grasslands evolved with herding animals subject to predation in California. The grazing animals did not evolve separately from their predators, grasses, soil life, or any species in the web of grassland life. Grasslands evolved with the interrelationships and interdependence of herding animals and their predators. Grasslands require the grazing and herding effects to remain healthy, diverse, and productive. As a range specialist for 35 years, what have I learned about how we manage plants and grazing animals in our grasslands?

(I think fire is an overrated restoration or management tool where grassland fires are predominantly human artifacts rather than lightning.)

Humans have changed the equation. Overgrazing of individual native perennial plants (and annuals) is predominant in our California grasslands where livestock are present in pastures for long periods during the growing season. From the plant's point of view, overgrazing occurs when the plant is stressed by the imbalance of its solar collector and the energy demands of its rootmass, and regrowth is grazed again before the plant has fully recovered its vigor. The negative effects on rootmass, soil structure, productivity, soil carbon sequestration, reproduction, and biodiversity above and below ground are all negative and are cumulatively additive as the number of overgrazed plants in a field increases. Invasive species can become more invasive unless they too are overgrazed.

Overgrazing can be remedied by providing adequate plant recovery periods instead of grazing regrowth too soon. I've learned that words like overgrazing, intensive grazing, rotational grazing, and severe grazing mean very different things to different people, including those in the range profession. I've learned to always ask: "What do you mean by that?"

Native perennial grasses and native perennial forbs are variously "invading" my grazed annual grassland, as are nonnative perennials. The evidence of

Cattle happy to remove excessive shading from seedling perennials *Richard King*

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succession toward perennials occurring in annual grasslands is neither unique to my property nor rare, despite the entrenched belief that it is neither practical nor possible. Evidence is everywhere. I've seen native needlegrass invading medusahead rangeland west of Corning. I've seen native blue wildrye move beyond the confines of a blue oak understory and invade the open prairie. I've seen native California oatgrass invading my annual grassland. And I've seen countless other places where native or nonnative perennials are increasing when managed purposefully or accidentally to benefit plant vigor. I rather enjoy referring to native perennials as "invading" our annual grasslands, since the paradigm (i.e., strongly held belief) is that it can't and doesn't happen, and I've learned the facts are otherwise.

Management is everything. Shifts in succession that I've encountered seem always related to past and present management of grasslands. I've learned many principles that apply to grassland management. Minimize overgrazing by providing adequate plant recovery periods after plants are bitten, minimize excessive thatch accumulation by knowing where the environment is on the brittleness scale (i.e., effectiveness of biological decay vs. oxidation), always manage for good livestock performance, and always manage for financially sound enterprises. Always manage ecosystem processes—don't focus on parts. The faces of nature can be simply viewed from four perspectives as the nutrient cycle, water cycle, solar energy flow, and community of life dynamics—none of them exist in isolation or can be managed separately. Only the "whole" can be managed successfully, which includes the people and finances involved.

Learning for Tomorrow

All California grasslands are managed the way they are because of decisions by people. Whether a decision is to do or not do some action, even being indecisive is a decision made by people. I know of no grasslands that aren't managed by people who make decisions about what to do with them or on them. Decisions are founded in endless permutations of our beliefs, experience, research, advice from others, and best guesses.

Shifts in succession that I've encountered seem always related to past and present management of grasslands.

The most powerful tool I've learned to improve grassland management (or any other environment) is the Holistic Management® framework for decision-making, which differs dramatically from how we tend to make decisions. In this novel framework, decisions are always made toward a goal driven by the values of the decision-makers, what they must produce to have and enjoy those values, what the environment must be like ASAP to produce those things and enjoy those values, and, finally, what the greater community must be like ASAP because few on this planet can stay successful in isolation from others.

Developing such a goal first requires outlining who the key decision-makers are, what they manage, and what resources they have access to that might be of help in their management decisions. Then, any proposed action or plan can be tested in relationship to the holisticgoal by using seven testing guidelines to ensure the decision is ecologically, socially, and financially sound—much like a pilot uses a checklist before taking off to avoid having a wreck.

Not only does this framework include focusing decisions on enhancing and protecting our life support system (i.e., mother nature) in order to enjoy what we most value, specific planning processes outline how to develop sound grazing plans, financial plans, land plans, policies, and basic biological monitoring. Its not that any of this other than the grazing planning is really new and different; it's the synthesis of addressing land, people, and money issues simultaneously that is unique. I use it only because of its simplicity—even I can figure it out and use it, although I'm one who needs a bit of training rather than just reading how to use the framework. This decision-making process requires some humility because any decision that affects our incredibly complex environment is assumed to be wrong so that close attention and monitoring happens to change course quickly if needed.

The grazing planning process is quite different because I'm not aware of any other step-by-step grazing planning process that begins by asking: "What is the plant recovery period necessary to fully restore a severely bitten plant's vigor and root mass?" before the length of grazing in a field can be determined. Sadly, our conventional focus on residual dry matter as the standard for planning grazing on California annual grasslands does nothing to encourage sound grazing planning from the plant's point of view. Holistic planned grazing strives to minimize overgrazing of plants and prevent excessive accumulation of thatch in environments where biological decay of dead material is not adequately occurring—all in a way that works well for the manager and the pocketbook.

I've practiced using this new holistic grazing planning process on my own property for 18 years and am still learning how to improve and accelerate my skills at managing nature's patterns, pulses, and processes in California's grasslands and helping others do so. I've learned prescriptions don't work but sound planning processes do. Teaching these principles and processes to others interested in more effectively setting goals and developing plans to manage their land and livelihood has been just plain fun. CNGA has offered workshops in holistic grazing planning that will benefit California's grasslands and grassland managers.

Probably the biggest thing I've learned is that there are no experts—we are all learning together—and that can be fun!

Registration is open for Spring 2011 CNGA workshops!

Register by mail, fax, phone, or online: 530-661-2280 | www.CNGA.org

- **1. April 14: Identifying the Native and Naturalized Grasses of California, a 1-day workshop**
  Participants receive an introduction to California's grassland ecology, learn the qualities of specific native grasses for restoration, and become skilled at recognizing the basic groups and common species of California's grasslands through work with plant samples in the classroom. While not a prerequisite, this course is a great precursor to the April 15 Field Day at Hedgerow Farms. There, you will have a great opportunity to use your ID skills as you experience a wide array of native and naturalized grassland species in the field.
  Location: Yolo County (specific location to be announced) **Fees:** $120 CNGA members / $140 non-members / $75 students w ID

- **2. April 15: 4th Annual CNGA Field Day at Hedgerow Farms, a 1-day event**
  For a 4th consecutive year, CNGA is teaming up with Hedgerow Farms to provide an excellent opportunity for practical, hands-on learning about native grasses and grassland restoration. Participants will learn from expert instructors, be immersed in a wide variety of grassland projects, and enjoy networking with a diverse group of people who share a common interest in California grasslands.
  Location: Hedgerow Farms, Winters **Fees:** $60 CNGA members / $75 non-members / $35 students w ID

- **3. May 27: Grassland Monitoring Methods, a 1-day workshop**
  How do I determine if my grassland restoration project is a success? This workshop will focus on multiple grassland monitoring techniques, including how to monitor vegetation and wildlife within a grassland setting. The course will feature classroom instruction as well as field practice with a variety of monitoring techniques.
  Location: Davis (specific location to be announced) **Fees:** $120 CNGA members / $140 non-members / $75 students w ID

- **4. June 11: Introduction to California Grasslands and Grass ID, a 1-day workshop**
  Take your first steps into learning about an important yet underrated ecosystem in this new workshop that features lecture, lab, and field components. The lecture will provide an overview of California grasses and grassland diversity, ecosystem values and services, management challenges and strategies, and restoration and landscaping with native grasses. During GrassLab, we will answer the question "What are grasses?"; learn the basics of grass taxonomy, morphology and anatomy; and identify the common native and nonnative species with the help of dissecting microscopes. Then we will head into the field to examine and enjoy first-hand the bounty of native grasses at the Pepperwood Preserve!
  Location: Pepperwood Preserve, Santa Rosa **Fees:** $30 CNGA members / $35 non-members / $25 students w ID

- **5. (Not yet scheduled): Using California Native Grasses in the Water-Conserving Landscape, a 1-day seminar**
  At this seminar, you will learn how to use native grasses, sedges, and rushes successfully in a variety of settings to create beautiful residential, commercial, and public landscapes. Besides saving irrigation water, native grasses can rebuild soil and prevent erosion, enhance wildlife habitat, and lower maintenance costs. The latest applications of native grasses for treatment, attenuation, and infiltration of stormwater in bio-swales will be addressed.
  Fees: $120 CNGA members / $140 non-members / $75 students w ID ***(Check #5 below to be notified.)***

Registration Form: CNGA Spring Workshops | 2011

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 e-mail _____

Fees:
1. ***Identifying the Native and Naturalized Grasses of California*** *(Yolo County)* ☐ $120/CNGA members ☐ $140/non-members ☐ $75/students
2. ***CNGA Field Day at Hedgerow Farms*** *(Winters, CA)* ☐ $60/CNGA members ☐ $75/non-members ☐ $35/students
3. ***Grassland Monitoring Methods*** *(Davis, CA)* ☐ $120/CNGA members ☐ $140/non-members ☐ $75/students
4. ***Intro to California Grasslands and Grass ID*** *(Pepperwood Preserve, Santa Rosa, CA)* ☐ $30/CNGA members ☐ $35/non-members ☐ $25/students
5. ***(Not yet scheduled) Using California Native Grasses in the Water-Conserving Landscape*** ☐ notify me when scheduled

☐ Check made payable to California Native Grasslands Association ☐ Payment by credit card (please check type) ☐ Visa ☐ MasterCard ☐ American Express

Card number _____ Expiration date_____/_____

Street address for card _____ Zip _____ 3-digit code_____

Questions concerning registration? Please contact CNGA by phone/fax: 530-661-2280, or e-mail: admin@cnga.org.

20th Anniversary membership survey

Thank you to everyone who completed our membership survey! We hope that the ability to choose more than one answer as "highly important" honored the complexity of the work our members do. As a result, percentage points for those questions total more than 100.

Q1–2: Demographics

About 60% of our members are land managers or work on planning and implementing restoration and mitigation projects. Almost 90% of our members work professionally with grasslands, 40% work for government agencies, and 30% are employed by private companies.

Q3: What skill areas would you like more help with?

The survey responses revealed that there is substantial interest in all five choices (Fig. 1). More than 50% of members would like more help with the topics of restoration methods, long-term management, and identification of grassland plant species; 35% of members or fewer chose species selection or monitoring.

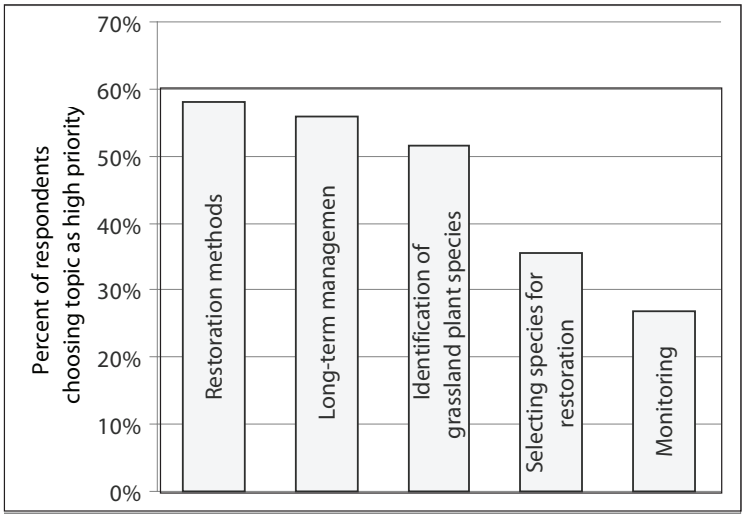

Fig. 1. What skill areas would you like more help with?

Q4: How should CNGA work to conserve California's grasslands?

64% felt that CNGA should work to raise public awareness of the importance of California grasslands (Fig. 2). Advocating for threatened native grasslands and pursuing governmental policy for native grassland protection were ranked second and third. The underappreciation of grasslands by the public, decision makers, and legislators is clearly recognized by our members. The Board of Directors plans to address this underappreciation in 2011 (for example, through a new workshop offering), but greatly encourages help from motivated members.

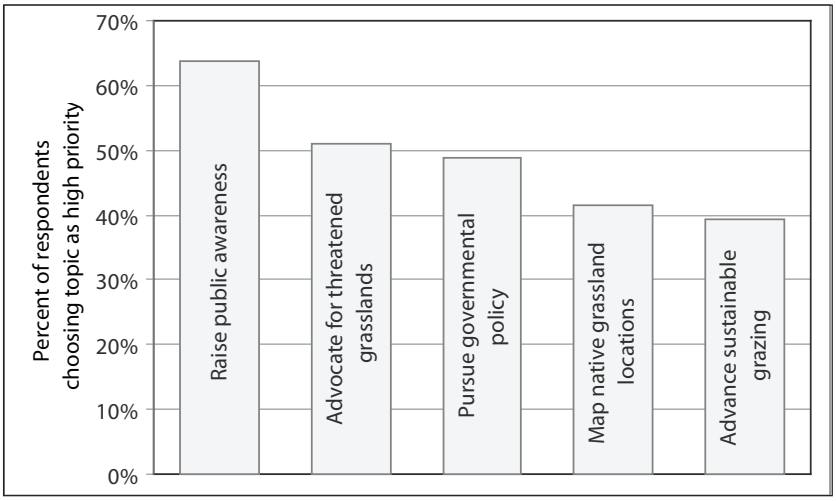

Fig. 2. How should CNGA work to conserve California's grasslands?

Q5: If you could commission a research topic, what would it be?

This question elicited the strongest agreement of any question asking for priorities (Fig. 3). Although presented with nine choices, 62% of members identified weed control as a high priority. Research on grassland wildlife ecology was ranked second with 48%, followed by soil regeneration and ecosystem services. Greater information on wildlife and ecosystem services will likely aid our conservation efforts.

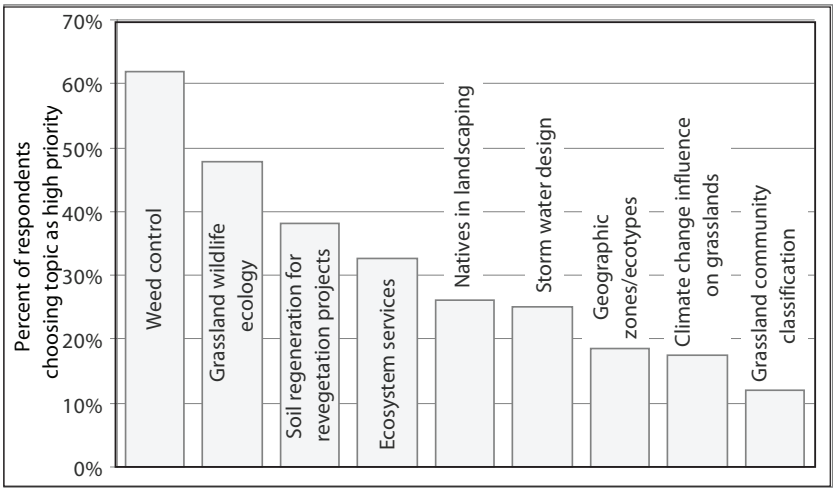

Fig. 3. If you could commission a research topic, what would it be?

People generally identify more readily with animals, so bringing attention to grassland animals may galvanize more support. Ecosystem services, or nature's value, has the benefit of adding the human element to the conservation equation.

Q6: Is CNGA making decent progress on its mission?

77% of members value and support what CNGA is doing. Thank you! We are also grateful for the thoughtful and candid comments. Positive comments on CNGA's workshops were most common. As one of our primary goals is to educate professionals, we are happy to see widespread satisfaction. The second most common comment was regarding the need for greater public outreach to promote the value of native grasslands. CNGA's Board of Directors agrees that this topic needs more investment. The Development and Outreach Committee is looking for ideas on where to focus the message and how to word it. Interested? See page 10.

Q7: Which of CNGA's current communication tools do you like?

The *Grasslands* newsletter, workshops, and field days all scored very well, followed by conferences. Workshops were the most universally liked, with only 1% dissatisfaction. The website was the least popular. Again, this falls under the purview of the Development and Outreach Committee, and if you have the desire to help, please see page 10.

Q8: Which new communication tools should CNGA develop?

With 72% of members voting for field trips that highlight California grasslands, this tool was by far the most popular (Fig. 4). Following at 51% was the interactive map of grasslands hikes on our website, so people can find and enjoy those areas on their own. Webinars were not selected as frequently. This coupled with the fact that workshops and field days received positive feedback indicates that people want in-person trainings and learning experiences. Only 8% of members favored developing a social networking site for CNGA.

Thanks again to all those who took the survey! The Board of Directors will use these results in planning future CNGA activities. If you have any questions about the results, please contact Zachary Principe at ZPRINCIPE@TNC.ORG.

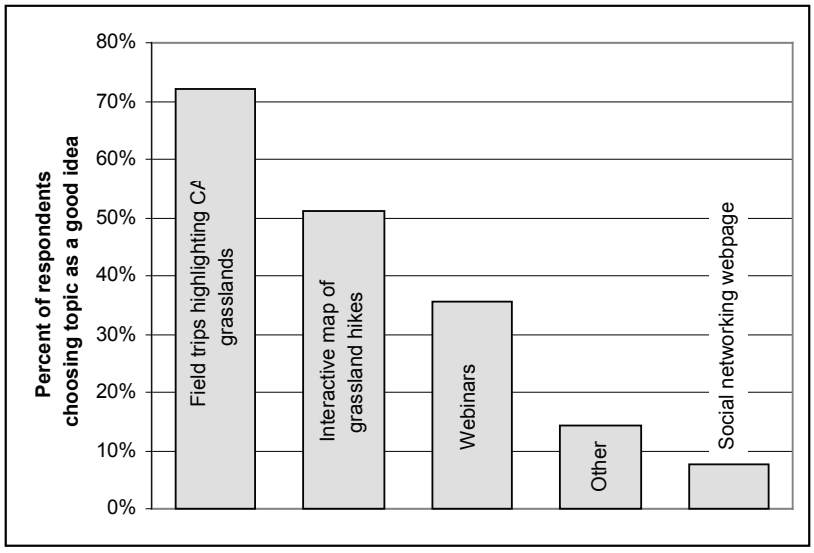

Fig. 4. **Which new communication tools should CNGA develop?**

Election results

Bylaws changes approved

Two changes to the CNGA Bylaws were approved. To view the Bylaws in their entirety with the approved changes, go to the CNGA web site: WWW.CNGA.ORG.

1. The President-Elect position shall be renamed Vice-President.
2. Those Board candidates not receiving sufficient votes to be elected may be asked to serve as Board Alternates at the discretion of the seated Board.

Meet the CNGA Board

CNGA members have voted in 13 Board members: 3 officers, 8 at-large members, and 2 alternate members (see their bios below). Officers' terms are for 1 year; at-large members, 2 years. Seven of those elected are returning Board members; 8 are brand new.

Board members Andrew Fulks, JP Marié, Jon O'Brien, and Zachary Principe are now serving the second year of their 2-year terms; they did not stand for election. Welcome to all!

The CNGA Board and staff extend thanks and appreciation to retiring board members David Amme, Clare Golec, Sarah Hoskinson, David Kaplow, and Christina Smith and look forward to their continued connections to CNGA.

Officers

Wade Belew, *Stewardship Coordinator, Cotati Creek Critters, Cotati*

I joined CNGA to expand the botanical knowledge necessary to complete an understory restoration project for an urban stream restoration project in Sonoma County. I now collaborate with the local water agency to increase the use of native grasses, sedges, and rushes in revegetated flood control channels.

I had the pleasure and honor to serve CNGA as president in 2010, and am happy to continue this service in 2011. My main goal is to empower the Board to be as effective and efficient as possible.

I helped schedule, organize, and present workshops and created a PowerPoint presentation about California grasslands. In 2011, I will present "Introduction to California Grasslands and Grass ID," a new entry-level workshop/field trip. I will also chair the 2012 Conference Committee.

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Liz Goebel, *Product Operations and Outreach Coordinator, Hedgerow Farms, Winters*

My current work at Hedgerow Farms, a native grassland seed production farm, reflects my personal interests and past restoration work. I worked with Audubon California and mentored with the Center for Land-Based Learning before starting graduate school.

Last year, I received a Masters Degree from UC Davis in Restoration Ecology (specifically of grasslands), and I have worked at Hedgerow Farms ever since. At Hedgerow I use my background in restoration ecology, public education, and outreach to further the scientific, sales, and outreach missions of the farm.

This Board term I will serve as Secretary and continue as Chair of the Grasslands Editorial Committee. I have learned a lot since joining the Board, and my involvement with CNGA has continually increased.

I look forward to many years of service to CNGA. I am continually inspired by the work CNGA has done over the years and look forward to increasing our reach.

Sara Sweet, *Restoration Ecologist, The Nature Conservancy, Cosumnes River Preserve, Galt*

I served as CNGA secretary for the past 4 years. This term, I will serve as treasurer. As secretary, I won a reputation for keeping accurate, thorough records. I will apply those skills to monitor financial transactions and ensure fiscal responsibility.

My professional and academic life has long been involved with grasslands. At the Cosumnes River Preserve, my duties include manipulative experiments in vernal pool grasslands, preparing grassland seed palettes, and advising on grassland restoration and management.

My master's degree from UC Davis focused on prescribed burning to control invasive exotic grasses. At UC Santa Cruz, I conducted an experiment to test the possible effect of cattle grazing on the pollination success of tidy tips.

At-Large Members

Dan Blankenship, *Staff Environmental Scientist, California Department of Fish & Game, Valencia*

B.S., Humboldt State University, major in Wildlife Management, minor in Range Management, 1982.

I have enjoyed a varied career working to conserve public trust resources for city, county, and state agencies: ecologist at State Parks; upland game biologist, senior wildlife biologist, staff environmental scientist, and habitat restoration specialist at Fish and Game. I currently work as a CEQA/CESA lead assigned to the Santa Clara River and Calleguas Creek watersheds.

My interest in grasslands began during Range Management studies at HSU and continued during habitat restoration work. In my current position, I have become more aware of native grass conservation and restoration opportunities and needs.

I am interested in facilitating outreach, education, research, and restoration opportunities within southern California.

Lindsay Dailey, *Consultant, Regenerative Design, Davis*

I work with land owners to create management plans for productive landscapes that regenerate ecosystems and produce food sustainably. I am particularly interested in techniques for rehydrating our landscape through infiltration strategies and carbon sequestration. Healthy, thriving grasslands play an important role in both of these crucial ecosystem services.

I have a broad background in nonprofit management, curriculum development, sustainability, and education. I am eager to use my experience in fundraising and outreach to help further CNGA's mission.

I have worked with the CNGA Board to develop a prototype native grass ID field guide. As a board member, I will participate in expanding educational outlets, creating educational materials, and broadening CNGA's audience by bringing information about the importance of our grasslands to the general public.

Erik Gantenbein, *Ecologist, Sacramento*

I became interested in CNGA 20 years ago while working as a restoration ecologist. Working in a variety of habitats throughout the state, I realized the challenges and difficulties that come with preserving and protecting our valuable natural resources. Many of the contacts that I made, while looking for assistance with a variety of revegetation projects over the years, were people associated with CNGA.

I have served in the past 10 years as a Board Member at large and as president. In that time, I have continued to develop a great appreciation for native grasslands and the people who care about them.

I would like to continue the tradition of making CNGA a valuable resource for anyone interested in preserving, protecting, and restoring California native grasslands. I also would like to see an increase in outreach efforts to the general public through publications and other media about the value of native grasslands.

Jim Hanson, *Landscape Architect, Environmental Projects, Caltrans Bay Area, Oakland*

During the past 4 years on the CNGA Board, I have developed budgets and forecasting models, spoken at public hearings for native grassland conservation as Advocacy and Collaboration Committee Chair, and drafted grant proposals and strategic plans.

My continuing interest in CNGA is that public agencies will, as common practice, protect and conserve California's remaining native prairies and grasslands on the lands they manage—whether during planning, construction, or long-term land maintenance.

During this tern I will focus on: (1) Development of a native grass field identification card prototype. Conservation of native grass populations is enhanced when more people feel comfortable spotting remnant native grass stands in the landscape. (2) Build on CNGA's native grassland conservation work.

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Richard King, *Ecologist, NRCS-USDA, Petaluma*

I've been a USDA-NRCS rangeland and wildlife management specialist assisting landowners for 35 years. I worked in Flagstaff, Arizona, for 8 years and throughout northern California since 1982. In 2000, I became a Certified Educator in Holistic Management.

I am also a lifetime member of the Society for Range Management and have long worked at helping the range profession shed old paradigms so that rangeland health in California "annual" grasslands can be greatly improved.

Since 1991, I have enjoyed raising grass-fattened beef, building biodiversity above and below ground, and increasing "native" perennial grassland species on 40 acres that were part of my great-grandparents' farm on the outskirts of Petaluma.

Kathleen Kraft, *Project Coordinator, Sonoma Marin Coastal Prairie Working Group, Occidental*

For the past 10 years, I have been involved in grassland restoration and conservation; as a landscaper, I have used locally native plants to restore habitat.

I currently work with the Sonoma Marin Coastal Grasslands Working Group as project coordinator for the Coastal Prairie Enhancement Feasibility Study, a 3-year study funded by the State Coastal Conservancy to map coastal prairie in Marin and Sonoma counties, develop tours and educational materials for use by environmental organizations and the general public, and develop tools for the management of velvet grass infestations at five project sites.

I am a professional Baroque flutist, specializing in 18th century performance practice, with 35 years experience in performance, teaching, management, and concert production.

It is my hope that my in grassland education and restoration work can help CNGA to build public awareness of the precarious state of remaining grasslands.

Catherine Little, *Preserve Manager, Center for Natural Lands Management, Woodland*

Undergraduate degree in plant biology, UC Davis; M.S., botany, California State University, Chico. Master's focus: relationships between riparian vegetation communities and river processes.

While working on the Sacramento River, I became aware of the lack of native grassland habitat in the landscape and the importance of restoration and conservation of this valuable plant community.

I have worked in various grassland habitats for over 9 years. I worked at ecological consulting companies conducting botany and vegetation surveys, preparing restoration plans, and monitoring restored and natural grassland habitats.

I currently manage various habitat types, including vernal pool, vernal pool grassland, alkali grassland, upland annual grassland, wetlands, riparian, and oak woodland. I am interested in long-term management of native grassland habitat, strengthening the link between research and implementation, and educating people on native grassland monitoring.

Bryan Young, *Bufferlands Manager, Sacramento Regional County Sanitation District, Elk Grove*

I have been developing, promoting, preserving, and restoring California native grassland ecosystems since 1991. I began my natural resource management career at Hedgerow Farms, a native grass seed producer in Winters. In 1992, I completed a B.S. degree in Wildlife and Fisheries Biology from UC Davis. I manage the 2,650-acre Bufferlands with an emphasis on wildlife habitat conservation. For nearly 20 years, I have been involved with many successful habitat restoration and management programs, including several hundred acres of grasslands projects.

I have been an active member of CNGA throughout my professional career. I was first elected to the CNGA Board in 2004 and reelected to a second term in 2006. During my second term, I became chair of the Workshop Committee. I continued in this position in a third term with the CNGA.

I will continue to bring my knowledge of and enthusiasm for grassland restoration to the hardworking CNGA Board and further support its worthwhile mission.

Alternate Members

Barbara Going, *PhD Candidate, Department of Environmental Science and Policy, UC Davis*

Undergraduate degree in Ecology and Evolution, UC Santa Barbara; currently working toward PhD in Ecology (plant conservation focus) at UC Davis.

My interest in conserving native plant communities, especially California grasslands, began in Santa Barbara, at the Cheadle Center for Biological Diversity and Ecological Restoration (CCBER). CCBER manages nearly 250 acres of open space (including portions of intact native vegetation and wetlands) on the UCSB campus. In the 1½ years I worked as a CCBER restoration assistant, I helped restore native bunchgrass communities and gained a greater appreciation for the functional role that native bunchgrass communities serve and for the challenges that California's grasslands face.

I have conducted research in serpentine grasslands since 2005. I am currently exploring how climate change will influence community resistance to barbed goatgrass. Finally, my dissertation focuses on the effect of climate change on serpentine soil specialists, plant species restricted to patches of serpentine grasslands.

Education is our most powerful conservation tool. As a CNGA Board member, I will broaden my conservation efforts through public education and outreach.

Elise Tulloss, *PhD Candidate, Department of Plant Sciences, Graduate Group in Ecology, UC Davis*

My graduate research involves understanding native and exotic grass species' response to environmental change across the Central California region. I work in

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grassland ecosystems with a variety of management strategies and land uses. I frequently interact with managers from private, state, and federal lands.

I studied environmental science and biology as an undergraduate and participated in tallgrass prairie restoration in Illinois, where I first experienced how native grasslands have been lost and fragmented, a phenomenon further highlighted when I moved to California.

I will put to use my experience working in California grasslands, my leadership skills, and my enthusiasm for native grasses—all with the goal of serving the members and the mission of CNGA.

Membership Application

Detach and mail this form with a 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

All employees of a corporate member receive member pricing when registering for CNGA events.
All membership benefits are good for 1 year from the month of purchase.
All copies of *Grasslands* will be sent to the main contact at the organization.

	Membership Level	Annual Cost	Online (Color) Ads (w/link to member website)*	Grasslands (B&W) Ads (currently 4 issues per year)	Employee Memberships**	Grasslands Subscriptions***
☐	*Muhlenbergia rigens*	$1,000	Half page: 8.5 x 5.5 inches (637 x 412 pixels) at top of CNGA sponsor page	B&W version of online ad	6	4
☐	*Nassella pulchra*	$500	Quarter page: 4.25 x 5.5 inches (318 x 412 pixels) below *Muhlenbergia* listings	B&W version of online ad	5	3
☐	*Poa secunda*	$250	Business-card size: 4.25 x 2.75 inches (318 x 2 06 pixels) below *Nassella* listings	B&W version of online ad	4	2
☐	Associate/Agency	$125	Text listing below *Poa* sponsors for 1 calendar year	Text listing published in *Grasslands* for 1 calendar year	3	1

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

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Front cover: Yolo County canal vegetated with native grasses and sedges
Back cover: Monarch butterfly on its host plant, (*Asclepias fascicularis*)

Cover photos: John Anderson