CNGA'S 14th Annual Field Day at Hedgerow Farms

Sowing the Seeds of Grassland Restoration & Celebrating CNGA's 30th Anniversary

by Pat Reynolds[1] and Diana Jeffery[2]

The California Native Grassland Association (CNGA) presented the 14th Annual Field Day at Hedgerow Farms in a virtual format for the second year in a row in response to the coronavirus pandemic. CNGA President JP Marie, who served as the Zoom Master for this event, quickly resolved some initial technical issues, and the rest of the day went smoothly. There were 167 attendees, with participants attending from all over California and even as far as Colorado and Nevada.

We took full advantage of the virtual format by providing video tours of restoration projects from several locations in California along with the key operational aspects of Hedgerow Farms. The Field Day program featured the entire restoration process, from harvesting wildland seed, through increasing seed at the farm, to using seed and plugs in habitat restoration projects. In celebration of CNGA's 30th Anniversary, we called on some of our long-term members and former board members to provide their perspectives on the evolution of grassland habitat restoration over the last three decades. Finally, to honor CNGA founder and habitat restoration icon John Anderson who passed on in 2020, we included a tribute to Dr. Anderson and the incredible legacy of his work.

Evaluation responses were exceptionally positive, with participants showing a great appreciation for the technical depth, variety of restoration topics, and expanse of geographic area covered.

There was too much important information to cover here, but we will try to summarize some of the major points in the presentations. We ask the presenters to please forgive us for any omissions or misinterpretations. If you were unable to attend but would like to learn more, we are offering Field Day 2021 as an on-demand event. Registration information is on our website at cnga.org.

The day began with a video led by veteran restoration professionals Tanya Meyer of the Yolo County RCD, Bryan Young of the

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Sacramento County Sanitation District, and Jeff Quiter of Hedgerow Farms. They demonstrated how to collect wildland seed and discussed some of the many things to consider during the collection process. They stressed the importance of obtaining permission to collect wildland seed, collecting only a small proportion of the seed present, and the proper timing of seed collection, including some techniques to determine seed ripeness.

The next segment of the day featured how native seed is increased at Hedgerow Farms. Bryan Young, Jeff Quiter, Pat Reynolds from River Partners, and Chris Rose from Solano County RCD covered several topics, including the planning puzzle of choosing when and where on the farm to plant different ecotypes of the same species to prevent cross-pollination and maintain local genetics. They presented detailed protocols and techniques for growing out seed, including planting, weed control, irrigation, harvesting, and the importance of matching ecotype to the site conditions at different projects.

The day also featured an informative discussion of the 30-year evolution of grassland restoration by several seasoned restoration professionals. Truman Young, Professor Emeritus from the UC Davis Department of Plant Sciences, spoke on the element of time in restoration. He stressed how variable restoration success is across sites and years and how native forbs are often displaced over time by both native grasses and exotic annuals. He advised us not to judge the success of seeded native grasses by their initial density, as they grow slowly and can eventually dominate.

"Time is both the enemy and the friend of grassland restoration." — *Truman Young*

Long-time CNGA Board Member Jim Hanson discusses grassland conservation in what he calls "the grassland conservation two-step." He focused on how important it is to speak out or organize to protect or manage these unique habitats. The two-step process is the same for any size of grassland patch: Keep an eye out for a hidden native grassland gem in your area; then find a venue to speak and act in some way on behalf of these wonderfully resilient areas of grasses and wildflowers.

Former CNGA President and Preserve Manager for the Center for Natural Lands Management (CNLM) Erik Gantenbein, spoke from the Oxbow Preserve, located in Lathrop in the San Joaquin River floodplain. The preserve was set aside primarily as habitat for one of only two remaining natural populations of riparian brush rabbit (USFW 2020). The preserve flooded in 2017 and, because the site lacked quality high-water refugia with appropriate cover and food resources, CNLM had to supply emergency artificial cover structures and supplemental food for the brush rabbit (USFW, 2020). His message is that conservation is a continuing process.

"It's important to conserve but the job doesn't end there." —*Erik Gantenbein*

Seated on the front porch at his Poppy Hill Farm, CNGA Board Member Richard King spoke excitedly about grazing management and grassland health and how native perennial grasses and native perennial forbs were "invading" his ranch's annual grasslands! He was able to achieve this through holistic grazing management as opposed to conventional management, which he says is the opposite of the prescription needed for growing native grasses and forbs. The native perennials build soil, sequester carbon, and build biodiversity above and below ground—all helping the land act as a sponge to absorb rainwater. Holistic grazing management considers several aspects relating to the site, including poisonous plants, endangered species, riparian corridor health, animal performance, people, and money to find success—and Richard has fun taking part in it!

"We have to learn how nature managed these great grasslands." — *Richard King*

Ecologist Jaymee Marty's presentation covered the changes she has seen in how we approach grassland and vernal pool restoration and management—particularly shifts in our view of livestock grazing. Perspectives have changed dramatically from removing cattle to slowly realizing, as thatch build-up replaced wildflowers in non-grazed vernal pool grasslands, that cattle are an essential component of vernal pool management. Another notable change in our views is how we mitigate for the loss of vernal pools. Initially, vernal pools were packed into mitigation areas at the expense of upland grasslands. However, we learned that upland grasslands are critical in maintaining the diversity of animal life and ecological functions. Jaymee urges us to stop

"Grazing is important for maintaining diversity in grasslands including some sensitive habitats like vernal pools." — *Jaymee Marty*

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requiring vernal pool creation and focus on the conservation of existing vernal pools and their surrounding upland grassland habitat.

Rachael Long, Farm Advisor, and Interim County Director at the UC Cooperative Extension, Yolo County, presented "Corridors are for the Birds," a film she made with Wild Farm Alliance on the benefits of native hedgerows. The film focuses on declining bird species. Hedgerows provide many benefits, including safe dispersal corridors, nesting places, refuge, and food. She recommended identifying the birds in your area, planting a diversity of habitats, and installing nest boxes and raptor perches.

With the theme "From Farm to Field: Where are They Now (the Seeds!)?", the afternoon sessions featured a series of habitat restoration projects throughout California illustrated in a mix of slide presentations and video tours. Emily Allen, ecological consultant, and CNGA board member, added commentary in the Zoom "chat box" feature supplementing the information provided.

Valerie Eviner, Professor, from the UC Davis Department of Plant Sciences, led off with a discussion of drought in her presentation, "Challenges, opportunities, and priorities for managing grasslands during drought: perspectives from previous drought years." She began with a review of lessons learned from earlier droughts between 2012 and 2016. She cited research that showed drought decreased exotic annual grass cover and composition but had mixed effects on annual forbs. Although negatively affected, established native perennial grasses tended to persist and recover after drought. In another experiment, initial seedling establishment of native grasses was negatively affected by drought, but there was no difference in seedling survival by the fourth year. However, there is evidence that drought can positively affect native establishment because it reduces the abundance of non-native species. She emphasized how grasslands are more resilient to drought when they contain a diverse suite of species with appropriate disturbance regimes (to increase the forb seedbank) and healthy soil practices. Although grasslands can recover, droughts can have lasting impacts on soils and plants. She warns, for example, that future droughts may differ from the historic droughts that California has evolved with. What can we do to prepare our grasslands to be able to withstand these droughts of the future?

Promote and restore native grasses and forbs.

Protect groundwater resources that many native plants and ecosystems depend on.

Vic Claassen, Soil Scientist from the UC Davis Department of Land, Air, and Water Resources, shared his presentation titled, "Soil structure condition can improve plant growth during droughts." California's plants and soil systems have evolved with historically variable weather. However, the interval between rains has lengthened. He cited a study with five decades of weather data that found an increase in the average time between rainfall from 20 to 32 days across the west; the current 2021 winter rainy season fits this pattern. He pointed out that the problem with global warming is that "it will be hard on us, and it is so gradual that we don't perceive the trends."

He discussed ways to improve and protect the soil for optimal plant growth, noting the benefits of a protective mulch surface, granular water-stable soil aggregate structures, and a deep soil profile facilitating rainwater percolation, root penetration, and moisture retention. He offered prescriptions for improving soils and increasing water and root infiltration success. He noted that deep rooting perennial native grasses generate 'hydraulic lift' bringing subsoil moisture to the dry mid-soil horizons.

In her presentation, "Back-to-back burns: post-fire restoration of coast range grasslands," Michelle Halbur, preserve ecologist for the Pepperwood Preserve in Sonoma County, described observations, experiences, and outcomes from two large-scale fires in two years (Tubbs in 2017 and Kincade in 2019) and how fires have influenced their restoration practices at the preserve. Pepperwood's mission, to inspire conservation through science, makes them particularly well-situated to answer questions including, how do you insert your restoration and prescription burning into a new context with more frequent fires under climate change? How much fire is too much fire? What opportunities are there to steward affected areas towards native systems? How are fire and drought influencing the grassland communities? The grasslands regenerated quickly after the

> "Plants and soils work together. They depend on each other, and when we try and reestablish these systems on damaged sites, we need to kind of take an inventory of how many of those hidden soil characteristics are really helping plants grow and get them back in or help them regenerate by minimizing tillage and keeping the organics in the soil." — *Vic Claassen*

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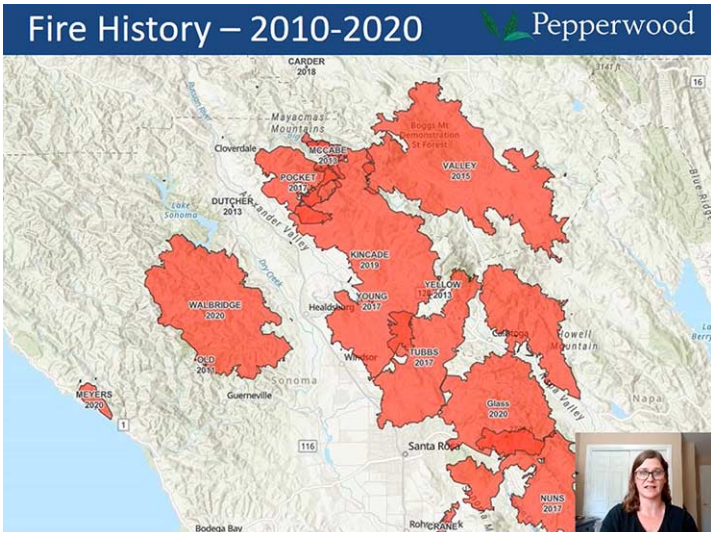

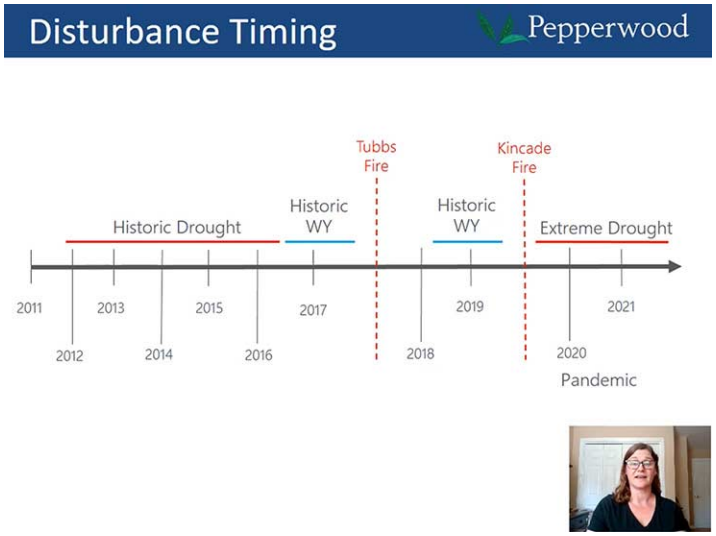

Left: Michelle Halbur presenting a slide depicting the disturbance at Pepperwood Preserve with historic droughts, water years (WY), two wildfires, and current extreme drought in Sonoma, Napa, and Lake Counties. Recent fires are larger in scale, more frequent, and with more overlap than under fire-suppression regimes (burn history map sourced from **www.wildfirefuelmapper.org**). Right: Wildfire history of Sonoma County, slide from Michelle Halbur's presentation.

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2017 fire and produced stunning wildflower displays. Native perennial grasses were the first to regenerate before precipitation because of their deep roots and the nutrients and sunlight made available by the fire. Challenges included the many bulldozer lines—although they were grateful for the bulldozer's fire work. She described in detail the process of restoring bulldozer lines to reduce erosion and restore grasslands.

She recommended this preparation for wildfire: Incorporate fire into your restoration and stewardship plans, consider starting a "fire-day fund' to cover unexpected costs, keep extra restoration planting stock, be creative, and think of ways to utilize succession to enhance your restoration success.

> "Areas with native grass populations really become obvious after fire. In fact, if you are going to map your native grasslands I recommend you do it after fire as it is so easy to find them." —*Michelle Halbur, observation after Tubbs Fire*

Stephen Sheppard, Director of Operations at River Partners led a video site tour titled, "Restoration of native herbaceous vegetation at large scale riparian restoration projects, Dos Rios Ranch." He described the techniques used to restore the understory at Dos Rios Ranch and showed us areas at different growth stages, from newly installed to several years after restoration. They planted three species: creeping wildrye, great valley gum plant, and mugwort. These species thrive in this floodplain habitat, provide resources for wildlife, and are fast-growing and aggressive enough to crowd out any competing weeds, ideally requiring no further weed control three years after establishment. Site preparation was 2-years of weed control before planting the understory. They planted in single-species swaths to facilitate weed control and prevent competition among the three species planted. They also created "life rafts" of high-ground refugia for the endangered brush rabbit and other animals during flooding events. He took us with him on a wonderfully swishing and crackling hike up through the native grass stands to the top of one of these "bunny mounds." And from atop one of the mounds, we're given a sweeping view of a portion of the property.

JP Marié, manager of the UC Davis Putah Creek Riparian Reserve and CNGA President, took us on a Russell Ranch mitigation area tour. He showed slides depicting the transformation of farm fields, pastures, and orchard lands into restored grasslands at the site located on UC Davis-owned lands. The location was designated to fulfill legal and regulatory mitigation requirements for development on the UC Davis campus. The goals were to create habitat for Swainson's hawks, burrowing owls, and valley elderberry longhorn beetles while informing future UC mitigation efforts adhering to the University's teaching, research, and public service mission.

The planning committee included grassland restoration mentors John Anderson and Truman Young. JP described the restoration process of converting the former farmed areas to grasslands. The project began in 2005, with site preparation and then selecting and planting Hedgerow Farm-sourced native grass and forb seed mixes.

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Grasslands grazing management using goats to remove thatch for bunch grass health at Bee Flat in southern California.

Weeds grew wildly the first year during a pre-drought wet winter, and JP took us through the weed control methods they used, including cattle grazing and prescribed fire. Local fire departments trained their crews by conducting controlled burns on the property—a win-win proposition! He explained how some type of periodic disturbance—burning, mowing, grazing—is required to remove thatch and keep the grasslands healthy. JP ended his presentation by showing photos of the restored area with colorful poppies and lupines blooming among the native grasses.

Next, Robert Freese and Collin Raff of the Irvine Ranch Conservancy and Megan Lulow from UC Irvine and UCI-Nature Southern California worked as a team in their site-tour video to share lessons they have learned on an Orange County mitigation site in the foothills of the Santa Ana Mountains. The restoration project is part of an agreement to restore a mosaic of habitats on property degraded by decades of heavy grazing and repeated wildfires. Collin introduced himself from the West Loma Ridge restoration project, 34 acres of native grassland habitat. Megan then described some factors to take into consideration when selecting a restoration site. Initially, they planted similar seed mixtures on both north and south-facing slopes. They found that native grasses performed well on north-facing slopes but not so well on the hot, dry south-facing slopes that favored scrub vegetation. Another factor they noted was soil properties. For example, purple needlegrass grows best on clay soils, which hold moisture longer into the growing season. Restoration site preparation included mowing and multi-year herbicide applications (2 to 4 years depending on weed species) to control the accumulated weed seed bank.

> "Remnant vegetation is a good guide to selecting grassland restoration sites." — *Robert Freese*

Robert described three approaches to establishing grasslands and gave pros and cons for each. The tour then took us to the Irvine Ranch Native Seed Farm, where seeds are grown and harvested for their projects. We traveled next to West Loma Ridge and Bee Flat Canyon grasslands, where they explained the restoration methods and necessary maintenance for each site.

They emphasized the importance of utilizing disturbance, such as mowing, raking, burning, or grazing (see photo), to maintain a healthy grassland.

In a video tour filmed on a residential site in San Jose, Billy Krimmel, Founder & President of Miridae Landscape Architecture & Construction, described the process of creating a native grassland meadow. When the project began five years ago, rip-gut brome dominated the area. They applied herbicide to kill the brome and converted the existing sprinklers to a drip system. After removing weeds, they dethatched the area and established a perennial grid of

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