



President’s Message

Dear SER GB members,

It’s the time of year when our Great Basin Chapter leadership changes, and I look forward to serving as your next chapter president. For those who don’t know me, I’d like to take this opportunity to introduce myself. I’m a professor in the Quinney College of Natural Resources at Utah State University. For nearly 30 years I’ve taught and conducted research about the role of humans in ecosystems – as land managers, users, disturbance agents, and restorers. Much of that work focuses on Great Basin issues. I was an original researcher in the SageSTEP project and am still heavily involved in that long-term study. I also lead the Great Basin Fire Science Exchange, which shares science about post-fire restoration with the region’s managers and stakeholders. Over the years I’ve been very active in the Society for Range Management and the Ecological Society of America as well as SER. What I especially love about our organization is that it stays close to the ground – engaging practitioners as much as academics – and I hope to help us find ways to do that even better.

Because it’s field season, things are quiet in the chapter right now. But as Trevor mentioned in his last message, we’ll be looking for ways to increase student engagement in Great Basin SER over the coming year, and I’m excited about that. Also we’ll be planning for the March 2022 meeting in Boise. I hope to see all of you there.

Sincerely,
Mark Brunson



Pennal Gulch ACEC, BLM Challis Field Office—Photo, Anne Halford

In this issue:

- Overview of the SER World Conference—Restoring understory diversity
- Local Great Basin participation in the SER World Conference
- Stories from the Sage
- Name this Seed—The story behind the clue
- Upcoming Events



SER 9th World Conference

Overview Symposium: Restoring understory plant diversity: considerations when incorporating native forbs in restoration

Sarah Barga, Research Geneticist, USFS Rocky Mtn. Research Station Rocky Mountain Research Station
Grassland, Shrubland, and Desert Program
Boise, ID

Native forbs provide important food and shelter resources for wildlife and are the component that adds species diversity to many native plant communities. This symposium provided an overview of some important aspects to consider when using native forbs in restoration and highlighted recent work relevant to different phases of restoration. Christina Blandino discussed regeneration from seed and seed germination syndromes of plants in ancient woodlands in temperate areas of Europe. Tara de Queiroz looked at seed increase of annual forbs for use in arid land restoration. Sarah Barga and Alison Agneray both examined the selection of particular populations for use in restoration. Finally, Anita Kirmer and Paul Gibson-Roy represented the use of forbs in restoration of species diversity and ecosystem function in their focal ecosystems, Australian grassy woodlands and agro-environmental schemes in Germany.

The presentations and discussion resulted in the sharing of many noteworthy details related to the use of native forbs in restoration. Cristina Blandino (Native Seed Science, Technology and Conservation Project) suggested that a good approach for incorporating forbs in a closed-canopy woodland might be to plant seedlings, rather than to put seeds directly into the ground, as a way to improve restoration success. Tara de Queiroz (University of Nevada, Reno – USA) shared that a major barrier for using native plants in restoration in the US was the lack of incentives for growers, to ensure that investments in the production of native seed will be worth the cost. Conversely, Anita Kirmer (Anhalt University of Applied Sciences – Germany) shared that the government in many regions of Germany insisted on the use of native plants in restoration and that she was able to use seed mixes containing only native species in some of her agro-environmental experiments to produce pollinator strips, with seed mixes containing up to 30 different native species. Alison Agneray (University of Nevada, Reno – USA) shared that her group is successfully working to grow-out forbs for restoration and that she had recently collected seed of a particularly promising population to send to a grower for seed increase; she elaborated that her group focuses on trait measures across populations and is testing how cultivation practices during seed increase may affect genetic diversity and trait values over time. Sarah Barga (US Forest Service, Rocky Mountain Research Station – USA) mentioned that their group has received much encouragement from federal agencies, academic collaborators, and non-profit organizations who are interested in supporting the use of forbs in restoration in arid systems of the US and that their academic partners are performing work related to competition with invasive species and plant-soil interactions that will complement the seed transfer guidance that is produced from the common garden experiment. Paul Gibson-Roy (Kalbar Operations - Australia) discussed the technique of removing topsoil, to remove weed seed banks and reduce nutrient loads due to agricultural use, as a way to encourage the growth of subdominant native forbs in grassy woodland ecosystems in Australia; he acknowledged that this techniques works with great success to restore complex native plant communities, partly due to the fact that many of the remnants that they are restoring are rather small,

but that they are working on how to scale the process for larger areas. Overall, we hope that this symposium has opened the door for more conversations with people who are interested in promoting the use of native forbs in restoration and help make connections with people who are interested in promoting the use of native forbs in restoration and help make connections between researchers working in different areas and ecosystems.



Photo by Bob Wick, Bureau of Land Management

BLM makes a difference at World Restoration Conference

Amanda (Mandie) Carr, BLM Coordinator of Botanical Communication and Outreach

The BLM Plant Conservation and Restoration Program (PCRP) played a prominent role in the Society for Ecological Restoration's (SER) 2021 virtual conference in June. SER is an international, non-governmental organization that advances the science, practice, and policy of restoration to conserve biodiversity and improve climate resilience. Every two years, SER hosts the World Conference on Ecological Restoration to bring together experts in the scientific, technical, and socio-economic dimensions of restoring damaged and degraded ecosystems.

BLM PCRP's participation in SER2021 included organizing a volunteer event, hosting an exhibit booth, leading symposia, and arranging for the registration of 70 BLM staff, all of which demonstrated that BLM is a world leader in the conservation and restoration of adaptive, resilient, and biodiverse ecosystems.

During SER2021's Make a Difference Week, BLM PCRP-HQ co-hosted a volunteer event with the Idaho Botanical Garden in Boise, Idaho to remove invasive weeds from the Garden grounds. Over three hours, 20 volunteers from BLM, USDA-FS, USGS, Great Basin Fire Science Exchange, SER, and others removed three cubic yards of weeds comprising 10 invasive species. These numbers added to SER's global tally for the Week, during which more than 2,400 volunteers across 34 countries planted 30,150 plants and removed 12,000 pounds of invasive plants and 25,000 pounds of garbage from lands and waters all over the world.

Peggy Olwell, BLM PCRCP Lead, convened one SER2021 symposium titled “The True Green Infrastructure: Model to Develop Native Plant Materials from Wildland Seed to Restoration” and presented in another session, “U.S. National Seed Strategy: First 5 Years and What the Future Holds.”

The “True Green Infrastructure” symposium featured five speakers discussing a national approach to developing locally adapted native seed for restoring resilient ecosystems. Topics included the importance of seed collections in preserving genetic material of fire-prone plant populations (Sarah Barga, USDA-FS), the recent explosion of native plant materials research (Francis Kilkeny, USDA-FS), monitoring after wildfire rehabilitation to inform adaptive management (Matthew Germino, USGS), BLM’s IDIQ Contract for Native Grass and Forb Seed Increase (Anne Halford, BLM), and an “all-lands” approach to collaborative restoration planning (Lynda Moore, USDA-FS).

The “National Seed Strategy” symposium featured six speakers who discussed the lack of genetically diverse native seed for large-scale restoration (Kayri Havens, Chicago Botanic Garden), scientific avenues to address the shortage of native seeds (Lesley DeFalco, USGS), decision support tools for land managers undertaking restoration (Vicky Erickson, USDA-FS), communication tools for successful collaborations (Patricia De Angelis, USFWS), regional approaches to native seed collection (Ed Toth, Mid-Atlantic Regional Seed Bank), and future directions for the National Seed Strategy (Peggy Olwell, BLM).



Blue Mountain prairie clover and seeds - *Dalea ornata*—BLM Seeds of Success Photo (DAOR2)

Walker Basin Conservancy's Water Conservation Program

Dash Hibbard, Stewardship Manager, Walker Basin Conservancy

The Salinity Problem

For decades, diversions from the Walker River have sustained a strong agricultural economy but produced an unintended consequence: dramatically reduced freshwater inflows to Walker Lake, a natural desert terminal lake at the terminus of the Walker River in Nevada. As a result of declining water levels, Total Dissolved Solids (TDS) in Walker Lake have increased dramatically to the point that the lake can no longer support its native fish and wildlife populations. As of May 28, 2021 the TDS level of Walker Lake is 23,400 mg/L. For comparison, typical TDS levels of ocean water is 35,000 mg/L while tap water is usually less than 500 mg/L.

Restoration Goal

The Walker Basin Conservancy works in partnership with local communities, private landowners, water managers, tribes and a variety of public agencies to restore Walker Lake. Through a series of studies and cooperative efforts, the Walker Basin Conservancy determined that its restoration objective is to increase natural flows in the Walker River to restore and maintain Walker Lake. To do so, the Conservancy has set its long-term restoration TDS goal of Walker Lake at 12,000 mg/L to allow the Lahontan cutthroat trout and other key species to thrive in Walker Lake. The last time the lake was at this salinity level was 2001.

Acquisitions

In order to reduce Walker Lake's TDS levels, an instream flow of water into Walker Lake is required. The Conservancy accomplishes the first part of its instream flow goal through its water acquisition program. Working with willing sellers to acquire water rights, and related assets, the Conservancy is on its way to acquiring enough water to make our restoration goal for Walker Lake a reality. To date, the Conservancy has acquired 51% of the water needed to restore Walker Lake's fishery.

Getting Water to the Lake

After water rights are purchased by the Conservancy, the water must be legally protected in the river to reliably increase instream flows to Walker Lake. Before acquired water can flow to Walker Lake, the purpose and place of use of the water right needs to be changed from an irrigation or mining right to an instream flow right. This is done through a process called a change application set by the Nevada State Engineer and confirmed by the federal Walker River Decree court. Once the various legal approvals are complete, the acquired water (now monitored and administrated as Program Water) will be protected in perpetuity for the instream benefit of Walker River and Walker Lake for ecological purposes.

To get Program Water into Walker Lake it first needs to flow through the Walker River Paiute Tribe Reservation located on the lower reach of the Walker River adjacent to Walker Lake.

The Walker Basin Conservancy works closely with the Walker River Paiute Tribe to ensure that Program Water will flow through the Walker River Paiute Reservation to Walker Lake, without affecting the Tribe's existing water rights. This is accomplished through a lower Walker River Conveyance agreement between the Conservancy and the Walker River Paiute Tribe.

The first change application, filed in 2011, was confirmed in May 2018 by the United States Court of Appeals for the Ninth Circuit, and administered by the Federal Watermaster in July 2019. The ruling from the Ninth Circuit Court, and subsequent confirmation at the federal Walker River Decree court, makes it possible for the Conservancy to begin calling on that specific Program Water during the irrigation season (March 1st through October 31st of each year). As of today, the Conservancy can only protect 19% of its decreed surface water assets instream to Walker Lake. In the coming years, it is the goal of the Conservancy to be able to administrate 100% of its water assets to Walker Lake, thereby taking another step closer towards its restoration goals.

Monitoring and Transparency

To determine how much of the Program Water is getting to Walker Lake, it is important to be able to monitor Program Water as it makes its way through the Walker Basin. Through a partnership with USGS Nevada, the Conservancy has developed an interactive mapping application (Hydro Mapper) to provide basin-wide perspective of real-time streamflow and lake and reservoir storage levels for the Walker Basin. The Hydro Mapper also provides access to historic streamflow, lake, and reservoir data. Program Water is monitored through the Hydro Mapper with several USGS gages in the Walker Basin. These gages help the Conservancy monitor the amount of Program Water instream to ensure its protection to Walker Lake. With a recent addition, the Hydro Mapper can now show how much Program Water has made it through the Walker River to Walker Lake at any given time. This tool was developed to create a common operating picture for water users in the Walker Basin and to help monitor changes to instream flows associated with the Program.

This is article two of four. Stay tuned for a more in depth look into Walker Basin Conservancy's restoration programs.



Walker Lake Recreation Area —BLM Photo

Name That Seed



A new feature in the Society for Ecological Restoration Great Basin Chapter newsletter.

The species is adapted to intense sun exposure. Plants have leaves with very narrow blades that resist water loss with excessive radiation. It is common in open terrain, rocky sites, meadows, and mountain sites with high sun exposure. It is a long-lived perennial (20+ yrs) that begins growth in early spring, flowers in April or May, and produces seed in June and July.



Roots, leaves, flowers, and fruits were and remain important to indigenous people. Biscuits and cakes were made from flour from the roots. Flowers, leaves, and roots were used to treat respiratory illnesses.

The species provides important spring forage to native ungulates, domestic grazers, bears, small mammals, greater sage-grouse, and a variety of insects. It is a host species for swallowtail butterflies (*Papilio zelicaon* and *P. indra*) and a nectar source for Puget blue (*Icaricia icarioides blackmorei*) and other butterflies.

At maturity seeds of this species are dry, papery, tan to brown, and easily dislodged from the inflorescence. This typically occurs 5 to 8 weeks after flowering in late June or July. Seed ripens uniformly within individual umbels but ripening can vary among umbels on the same plant or on different plants.

Trials for growing this species for seed production were conducted at Oregon State University's Malheur Experimental Station (OSU MES). Plants began flowering and produced some seed in their second year, but seed yields were low until year three. Seed was harvested for 11 years at OSU MES, where they found that seed production increased with irrigation in most years. Up to 3,195 pure live seed lbs/acre were harvested in a year with irrigation.

This species is recommended for restoration or revegetation in sagebrush, pinyon-juniper, and aspen zones where precipitation averages 8 to 25 inches (203-635 mm)/year. It provides good pollinator habitat and fair soil stabilization, and although it has a slow initial growth rate, it is competitive with weeds once established and persists as a mid- to late-seral species.

Answer. Nineleaf biscuitroot (*Lomatium triternatum*), learn more about this species and other native forbs useful for Great Basin restoration in the online book, [Western Forbs: Biology, Ecology, and Use in Restoration](#).




Upcoming Events of Interest

The following events and registration information can be found here: <https://greatbasinfirescience.org/events/>

2021 North American forest and conservation nursery technology webinar series.

Webinars will be Wednesdays, August 4 through September 8, 2021. Each webinar will last approximately one hour and include a Q&A session.

Planned webinar topics are: 

- Lessons learned in nursery operations during the pandemic
Water management and its effects on pests, pathogens, and plant growth
- Hot planting and fall/summer planting: operational tips and tricks for success
- Current programs and resources regarding genetics and assisted migration
- Innovative nursery technologies from other industries
- Current reforestation pipeline goals and legislation: expected impacts on growers and land managers

Reseeding and flood after wildfire

Forester Anna Higgins with the Nevada Division of Forestry, Ecologist Mark Freese with the Nevada Department of Wildlife, and Project Manager Danae Olson with the U.S. Army Corps of Engineers will discuss reseeded landscapes, and preparing for potential flood after wildfire.

Date: September 9

Time: 11:30 am - 1:00 pm PDT

The Second Conference on the Research and Management of High Elevation Five Needle Pines in Western North America – Oct. 5-7 Virtual Conference.

<https://highfivepines.org/>

Introduction to Low-Tech Wet Meadow Restoration: In this one-day virtual workshop, participants are introduced to: reading the landscape to recognize meadow conservation opportunities, various low-tech “Zeedyk” structures (e.g., One Rock Dams, Zuni Bowls), project planning, implementation, and monitoring. Regional instructors share tips and lessons learned from implementing low-tech meadow restoration projects across the West, while Wyoming conservation partners discuss local opportunities and considerations.

Upcoming Events of Interest cont'd.

[Low-Tech Process-Based Restoration of Riverscapes](#): This virtual workshop introduces conservationists to 'low-tech' process-based approaches for restoring streams and their associated riparian areas (riverscapes) to benefit fish, wildlife, and working lands. Participants will learn principles guiding low-tech process-based restoration and become familiar with simple, hand-built tools, including Beaver Dam Analogues (BDAs) and Post-Assisted Log Structures (PALS), intended to mimic and promote specific ecosystem processes. Participants will gain basic skills in the planning, design, and implementation phases of project development. Course content is supported by a published [Design Manual](#).



Herd Lake ACEC, Challis Field Office, Idaho. Photo, Anne Halford