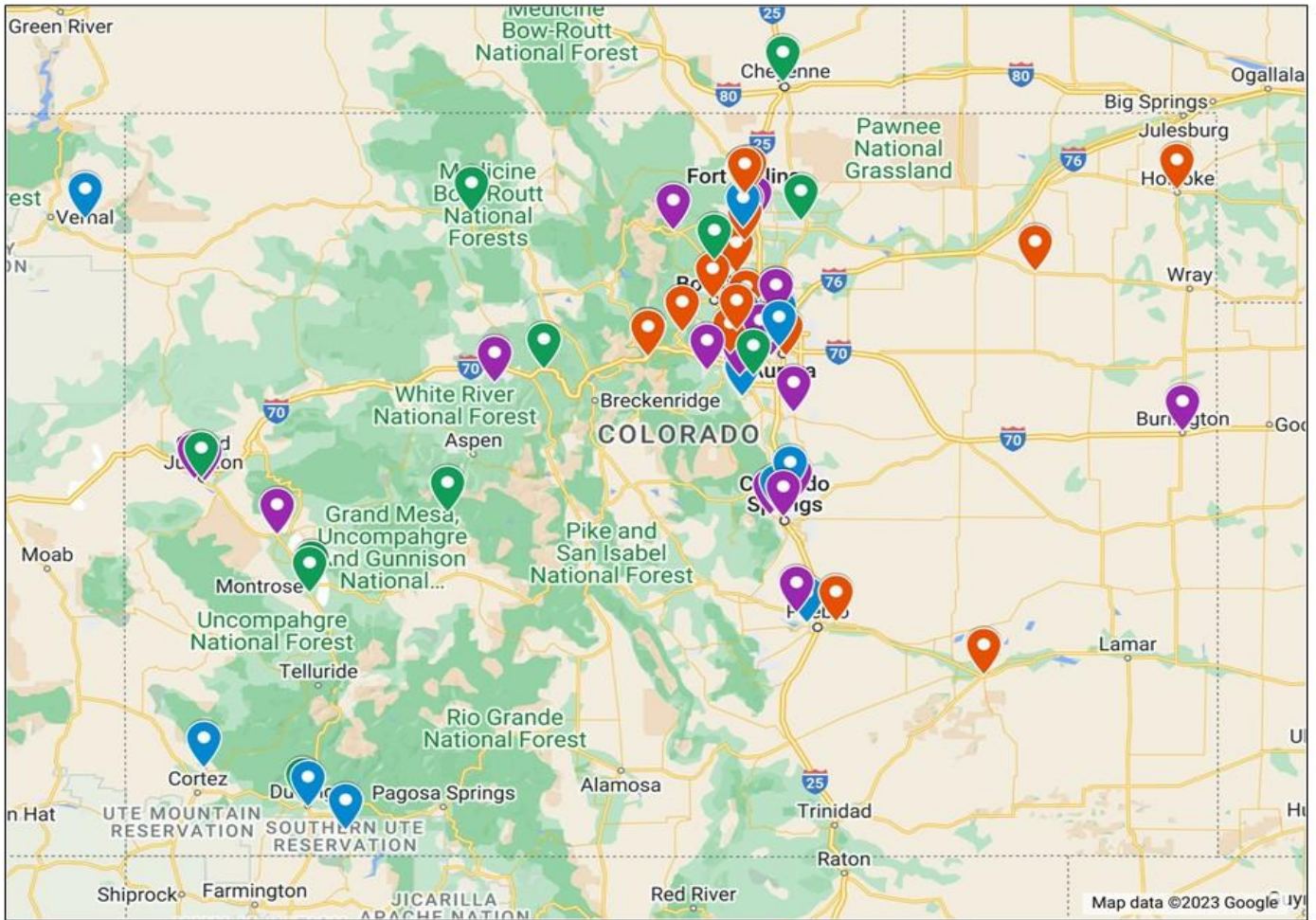


# *Aquilegia*

**Magazine of the Colorado Native Plant Society**

Volume 47 No. 2 Spring 2023





📍 Botanic Gardens  
 📍 Nature Centers and Museums  
 📍 City and County Buildings  
 📍 Other

## Colorado Gardens Featuring Native Plants

This issue of *Aquilegia* features a series of articles on demonstration gardens throughout the state of Colorado that contain native plants. We hope you have the opportunity to visit these gardens for inspiration in your own gardening efforts, or for general appreciation. <https://conps.org/native-plant-demonstration-gardens/>

### *Botanicum absurdum* by Rob Pudim



© Rob Pudim  
 SORRY, RYDBURG, "TOXICODENDRON" IS A GOOD GENERIC NAME BUT "ITCHESLIKEHELL" IS UNACCEPTABLE AS A SPECIES NAME... TRY SOMETHING ELSE!

### Photo credits

**Front cover:** Rocky Mountain penstemon (*Penstemon strictus*), sulfur flower (*Eriogonum umbellatum*), and columbines (*Aquilegia* sp.). © Bob Enever, co-founder of the Yampa River Botanic Park (see page 16 of this issue).

**Back cover:** Sangre de Cristo Mountains as seen from San Luis Valley, location of the 2023 Annual Conference. © Kelly Ambler

# Aquilegia: Magazine of the Colorado Native Plant Society

Dedicated to furthering the knowledge, appreciation, and conservation of native plants and habitats of Colorado through education, stewardship, and advocacy

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# Featured Story

## More Than Just Pretty Places—Native Plant Demonstration Gardens

By Ann Grant

Why visit a native plant demonstration garden? Besides being filled with gorgeous native plants in natural and perhaps innovative settings, they are a great source of ideas for your own garden. Looking at some of the pictures in this issue, I'm sure some of you are thinking, "Why didn't I think of that?" Perhaps use a clump of spiky sideoats grama (*Bouteloua curtipendula*) to add a vertical element to an otherwise flat landscape. Plant towering Maximilian sunflowers (*Helianthus maximiliani*) in front of a utilitarian fence to make a backdrop for a strip of prairie plants.

### Garden throughout the Seasons

Everyone loves to visit a garden in late spring and early summer when most plants are in bloom. But think about visiting in the "off" seasons. Early spring may yield some little-seen beauties like western Pasque flower (*Pulsatilla nuttalliana*), Easter daisy (*Townsendia* sp.), sand lily (*Leucocrinum montanum*), or my personal favorite, prairie smoke (*Geum triflorum*), so named for the airy seed heads.

Fall is a great time to visit, too, as late rains may have brightened the garden by rinsing off dust from a dry summer. As chlorophyll shuts down photosynthetic processes, the underlying pigment compounds, carotenes, and astaxanthins reveal their yellows, reds, and oranges in senescing leaves. The color palette changes quickly, so daily visits are rewarding for gardens close to you. Fruits and seeds that remain become more visible. You may also observe more birds and small mammals feeding in preparation for migration or hibernation.

In winter you can see the "bones" of a garden and better appreciate the layering of tall trees with smaller trees and shrubs below. Forbs and grasses sport their stems and seedheads poking above the snow where you may see overwintering birds feeding on seedheads. Children can be delighted by finding tracks of small mammals also foraging.

### Birds and Pollinators

If you are interested in birdwatching or observing pollinators, demonstration gardens are easy pickings. Hungry birds may be out hunting caterpillars for their nestlings, or attacking sunflower seedheads late in the season to stock up energy stores for migration.

Bumblebees are always buzzing around penstemons and other tubular flowers, and sphinx moths can be seen late in the day around sunset on four o'clocks (*Mirabilis multiflora*) and hyssops (*Agastache* sp.). If there is milkweed (*Asclepias* sp.), you may not see a monarch butterfly, but stop and observe the foliage closely. You will probably see the green larvae munching on the more tender leaves. There are many more butterflies and pollinators attracted to native plants, and many have specific symbiotic relationships. For more information on native plants

and pollinators, visit the [Xerces Society](#), which is very general, or the [National Wildlife Federation](#), where you can search on native plants and find their specific butterfly-only pollinators. You can also build a plant list for your area.

### Science in the Garden


For making scientific observations, a nearby garden is ideal. CoNPS has an ongoing project for making seasonal observations on phenology (different phases of plant growth) of many of Colorado's common species. In the spring, when growth is fast and

blooms may appear one day and then be gone, making observations a few times a week may be necessary, so having a garden nearby is helpful. You can also make observations on iNaturalist, although you will have to mark the plants as "captive" if they are in a planted garden. To join this important statewide phenology project, email:

[budburstcolorado@gmail.com](mailto:budburstcolorado@gmail.com)

### CoNPS Certification Program

Some public demonstration gardens have achieved gold-level status for our CoNPS Certified Native Garden Program. Did you know that individuals can also apply to get their gardens certified? You can have bragging rights and be invited to participate in our native garden tours. Participation in our garden tours is encouraged, but not required for certification. And don't worry about that compost bin or the twig pile, or even any part of your garden that is a work in progress. All are part of a healthy ecosystem, and the twig pile offers shelter for small songbirds. You can start the certification process here:

<https://conps.org/home-2/resources/certified-native-plant-garden/> 



Pasque flower (*Pulsatilla nuttalliana*).  
© Kelly Ambler

# Featured Story

## Looking for Inspiration? Visit Native Plant Gardens on the Western Slope

By Mary Menz and Jim Pisarowicz

Gardening with native plants can be daunting—there are many options to consider. Visiting public native plant gardens can help provide inspiration for anyone looking to foster native plants on their own property.

There are many reasons to include native plants in our gardens. Aside from being drought-tolerant, which is more important than ever, native plants provide habitat and nectar sources for native pollinators. These pollinators have coevolved with native plants, and they require native plants as hosts and food for their larvae. These same pollinators are also important food sources for birds during the summer months. In the grand circle of life, native plants play a critical role.

So, where do you start when you want to incorporate natives in your yard? Visit public gardens! When visiting public gardens, ask yourself these questions and take notes as they relate to your own space.

### What kind of soil are the natives planted in?

Are beds covered in pea gravel? Is there bare soil or sand, or does clay dominate the substrate? The most successful gardens feature plants in the type of soil they are found in naturally. For example, most plants in the wild in Colorado have little to no top dressing unless they are woodland plants surrounded by natural humus. Note, however, many public gardens may sometimes feature mulch of some sort around native plants.

### How much irrigation will be provided?

After new plants are established, they shouldn't need much watering, if any. That's just one of the benefits

of planting with natives. They have evolved over time with the weather and precipitation localized to certain habitats—for example, semiarid shrublands or the montane zone: each has a unique soil composition and watering needs. Be sure to choose plants native to your specific ecozone!

### Are the plants actually native to the region in which they are planted?

Note whether the garden features only plants that are native to a specific county or region. Note also if the garden includes plants native to other regions of the state that have similar conditions. There's no right or wrong answer, but this is the kind of information we need to consider in our own gardens. Determine whether natives and plants adapted from other areas are what you like and want to cultivate.

### Are there places for shade-adapted versus sun-loving plants, and are they grouped together accordingly?

Obviously, growing wetland plants in a native garden is not possible when they are positioned near cacti! But if you're planning to restore a marshy area, by all means look for plants that can thrive in moist areas.

### Consider plants that fit certain criteria on your property.

Take note of certain species that fill a specific need. For example, you may be looking for a plant that can hide or complement a feature of your yard. Examples might include vining natives that can climb a fence ►



Many national parks and monuments feature native plants and signage at their visitor centers. © Dinosaur National Monument. [http://www.nps.gov/dino/planyourvisit/visitorcenters.htm#Quarry\\_Visitor\\_Center\\_-\\_Utah](http://www.nps.gov/dino/planyourvisit/visitorcenters.htm#Quarry_Visitor_Center_-_Utah)



Native plant gardens provide visual interest in all seasons. Don't overlook winter visits to gardens to consider how different forms appear in winter. © Jim Pizarowicz

from the Tri-Rivers Colorado Master Gardeners. <https://tra.extension.colostate.edu/gardening-hort/ute-learning-garden/>

### Ute Indian Museum's Ethnobotany Garden, Montrose

This garden was completely restored to include native plants essential to the Ute Tribes. Interpretive signage describes more than 26 of the most important plants used by the Utes medicinally, culturally, or ceremonially. The signage also tells the story of the Ute Tribes' seasonal rounds through various ecosystems. This garden features more than 60 native plants. Private tours with a Native Plant Master are free but must be scheduled in advance. You can also walk through the public garden on your own. It's open year-round, 24 hours a day. Or you can join the [CoNPS field trip](https://conps.org/home-2/events/event-calendar-2/#!event/2023/6/1/plateau-chapter-field-trip) on June 1, led by Jim Pizarowicz. Visitors might also be interested in

the Shavano Valley Rock Art Site, accessed only by private tours scheduled through the Museum.

<https://www.historycolorado.org/exhibit/ute-indian-museum-grounds>

<https://conps.org/home-2/events/event-calendar-2/#!event/2023/6/1/plateau-chapter-field-trip>

### Canyons of the Ancients Visitor Center and Museum, Dolores

Just minutes from Cortez, where there are other garden sites that you can visit, the Canyon of the Ancients Visitor Center features a half-mile paved trail through native landscape to the Dominguez Pueblo. Interpretive signs identify plants along the trail, which ends at the McPhee Reservoir Overlook. The museum

“Native Gardens...” *continued on page 18* ►

◀ to provide privacy, or plants with shrubby features that might hide an irrigation box.

It's easy to get sidetracked when visiting public gardens! They feature plants we're attracted to, but many plants may not be appropriate or feasible for our yards. Take detailed notes and a lot of photos. Plan multiple visits to a specific garden to see plants you like in all their seasonal finery.

## Places to Visit

National monuments often have excellent examples of native plant landscaping at their visitor centers. Area botanical gardens are also a great place to check out natives in the landscape. Many are accessible by paved or gravel paths. Check out these options:

### Chinle Cactus & Succulent Society Demonstration Garden and Clifford Duncan Memorial Garden, Grand Junction

These gardens are located within yards of each other at the Colorado State University Extension Tri-River Area office at the Mesa County Fairgrounds. A late-spring visit ensures the cactus gardens will be flowering. Afterward, stroll through the Ute Learning Garden at the Clifford Duncan Memorial Garden, which provides visitors with a unique look into the life of the Ute Tribe and the harsh conditions of northwestern Colorado. This garden features plants that were important to Ute life as well as structures the Utes lived in at various elevations during seasonal movements. Schedule a free guided tour with a docent



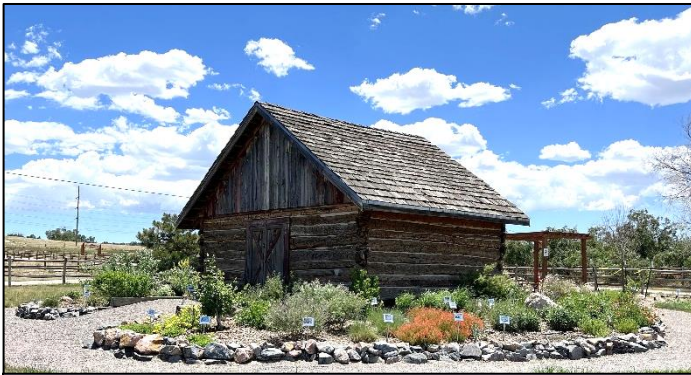
The visitor center at Canyons of the Ancients in Dolores features gardens at its front entrance as well as a half-mile paved path surrounded by native plants. Helpful plant stakes and signage describe the plants. © Jim Pizarowicz

## Featured Story

### Hidden Mesa Native Plant & Pollinator Demonstration Garden

By Lenore Mitchell

Near the parking lot of the 1,200-acre Hidden Mesa Open Space southeast of metro Denver, some lavender plants, a few *Ericameria nauseosa* (rubber rabbitbrush), *Asclepias speciosa* (showy milkweed), and weeds once surrounded a picturesque wooden cabin. But with the help of Andy Hough, the Douglas County Open Space Environmental Resources Coordinator, a few industrious Colorado Master Gardeners (CMGs) got involved, and, beginning in 2019, the lavender was gradually replaced with an array of Colorado native plants to create a spectacular garden.



The cabin at the Hidden Mesa Native Plant & Pollinator Demonstration Garden. © Connie Huffaker

Since gardening almost always involves moving rocks, Connie Huffaker, a 2015 transplant from Iowa and Missouri, and a CMG since 2018, drew up initial plans and pitched right in, hauling crusher fines for paths, pea gravel and wood chips for mulch, and strategically placing rocks. Sandy Stavnes, who has lived in Colorado since 1984, became a CMG in 2020 and immediately joined the efforts. Damon Simmons, who took master gardener training in Texas in 2015 and completed three levels in the Native Landscape Certification Program through the Texas Native Plant Society, returned to Colorado in 2019, completed master gardener training here in 2020, and joined the Hidden Mesa project. In addition to Master Gardener classes, Sandy and Connie have also taken classes through the Foothills-to-Plains Native Plant Master Program.

This trio extends their efforts for the demonstration garden beyond working with plants. Connie works seasonally at Tagawa Gardens, in Centennial, where she locates new plants and develops plans to make the Hidden Mesa Native Plant & Pollinator Demonstration Garden even better. Sandy's interest

in Native Americans' use of plants has led her to ongoing ethnobotanical research, and, with the help of Douglas County Extension Agent John Murgel, she is finding that many of the plants now grown at the garden were used by Native Americans. Meanwhile, Damon contributes to technical aspects, including developing the audio tour presentation, updating the website, and implementing outreach strategies.

Thanks to the collaborative and invaluable efforts of other CMGs and county residents, 2022 accomplishments include continued educational opportunities for both volunteers and the general public, and also four new garden sections: an ethnobotanical area, a section of native grasses showcasing 13 bunchgrasses and two turfgrasses that grow in Hidden Mesa's open-space areas, a berm with shrubs and a large variety of penstemons, and a succulent, low-water section featuring native plants growing right out on the mesa.

Goals for 2023 include volunteer education focusing on one native plant each session, outside-speaker presentations, participation in other garden tours along with visits to various county native plant gardens, and promoting increased awareness of this garden using social media and other sources.

Community education and outreach for both adults and children play major roles, and drop-in visitors can stroll the path on their own to enjoy informational plant

“Hidden Mesa...” *continued on page 32* ►



A monarch caterpillar enjoys lunch on showy milkweed (*Asclepias speciosa*). © Connie Huffaker

## Featured Story

### Other Native Plant Demonstration Gardens across Colorado By Sue Keefer and Patty Rhodes

Demonstration gardens featuring native plants are important resources for both gardeners and wildscape enthusiasts—they give us a sense of place, provide education about our native plants, and give us design ideas for our own gardens. We are fortunate to have several such gardens throughout the state. The first two articles in this issue of *Aquilegia* introduced some of these gardens; this article gives a brief overview of several more gardens that are worth visiting. Note that many of these gardens may contain non-native plants, especially those gardens focused on water-wise landscaping. A list of all known native plant demonstration gardens in and around Colorado can be found on the CoNPS website. <https://conps.org/native-plant-demonstration-gardens/>

#### Eastern Plains Gardens

##### Demonstration Gardens on the Golden Plains

Colorado State University Extension oversees two Plant Select gardens in the Golden Plains area of northeastern Colorado: one at the Phillips County Fairgrounds in Holyoke and a High and Dry Garden in Akron near the Washington County Fairgrounds.

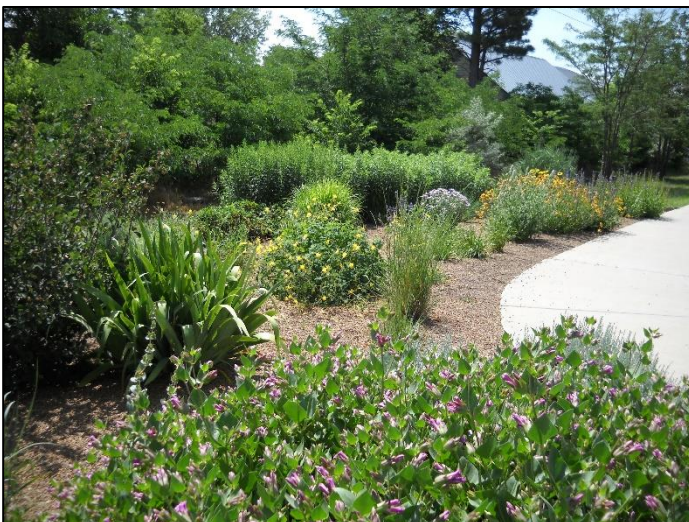
According to Linda Langelo, CSU horticulture program associate, the Plant Select gardens feature plants that can flourish with less water and thrive in a broad range of conditions; are habitat-friendly, tough, and resilient in challenging climates; are one of a kind/unique; can resist disease and insects; have long-lasting beauty; and are noninvasive. Any plants chosen by the Plant Select program have undergone seven years of a trial period and passed successfully.

In describing the High and Dry Garden, Langelo related that it demonstrates plants that can survive without being regularly irrigated: “a truly drought-tolerant selection of plants.” The garden has a variety of plants, each of which has its own growing season when it needs moisture. The selected varieties do well on the eastern plains with 9–17 inches of precipitation per year.

This garden contains not just regional native species, but also common garden perennials, along with the Plant Select plants for a wider variety of plant material. “Having any of these in our landscapes means better water conservation, and freedom from purchasing fertilizers and pesticides,” Langelo said; “a garden that truly adapts to the environment built from plants you do not need to replace after one or two seasons.”

Gravel is used for mulch, which helps air circulation around the crowns of plants. The garden isn’t fertilized, and soil amendments have never been used. Langelo said the garden can tolerate up to two months without rain before any supplemental water is added, and only during the growing season. “Even in a year when plants get only seven to nine inches of water, the plants manage to survive, and some, like native *Mirabilis*, columbines, and *Gaillardia*, are tough.”

She noted that *Penstemon* survive in the garden if there are ample spring rains, which allow them to endure a long summer drought. If the spring is dry, the plants struggle in the summer and may not survive; however, the plants seed themselves and are prolific, so they may reappear the next season. ►



The High and Dry Garden near the Washington County Fairgrounds. © Linda Langelo



Winecups (*Callirhoe involucrata*) at the Phillips County Fairgrounds. © Linda Langelo





One of the gardens at the Otero County Courthouse.  
 © <https://plantselect.org/garden/otero-county-courthouse-garden-la-junta/>

◀ For a full listing of plants for either of these gardens, contact Langelo at the Sedgwick County Extension Office, 970-474-3479.

### Otero County Courthouse Garden

A garden at the Otero County Courthouse in southeast Colorado was established in 2005. The Otero County Commissioners and County Administrator had agreed to let Jo Jancar, the county's health department program director, take charge of the garden area. She was able to purchase Plant Select plants when accompanying a friend from the Crowley County Extension office to a program at the Denver Botanic Gardens. Many of the plants, though not all, are native to Colorado.

Jancar said she has been managing the garden with the help of the facilities manager and building maintenance staff, "who have been essential to the garden's success." Since the establishment of the garden, county commissioners and administrators have continued to support the project.

<https://plantselect.org/garden/otero-county-courthouse-garden-la-junta/>

## Front Range Gardens

### Aurora Water-wise Garden

Located at the corner of East Alameda Parkway and South Chambers Road, the Aurora Water-wise Garden, which celebrates its twentieth anniversary this year, is a botanical showcase of more than 200 low-water plant species. Here visitors can see just how lush a water-wise landscape can be.

In its six acres, there are several themed garden beds, including Go Native, Z-zone, and Pollinators' Paradise. Visitors follow the signage through water-wise landscaping principles, and plants are labeled.

One of the core values of the Aurora Water-wise Garden is environmental stewardship. It supports

Colorado native plants and native cultivars as well as non-native species, and is a Plant Select Showcase Garden, where visitors can find plants designed to thrive in high plains with less work.

The garden uses little supplemental water. If needed, irrigation is from reclaimed, non-potable water (treated but not suitable for drinking) from Aurora's Sand Creek Water Reclamation Facility.

The Aurora Water-wise Garden is a living testament to the efficient use of water through education, demonstration of proven techniques, and experimentation. This year, there will be free seasonal water-wise classes as well as tours for visitors to enjoy and celebrate the garden. Private group tours are available with four weeks' advance notice.

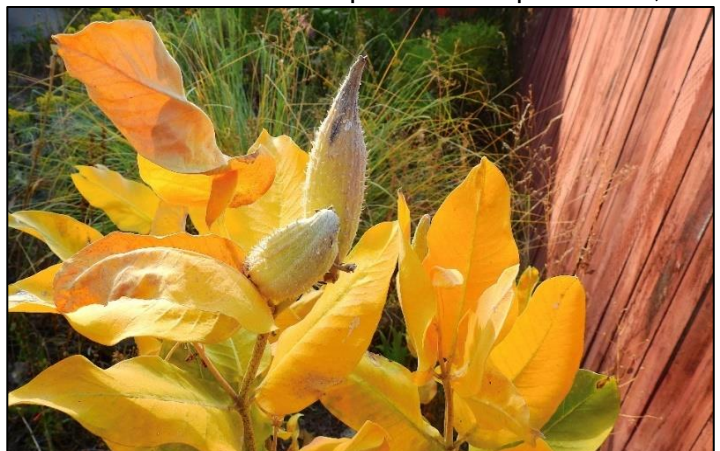
<https://www.auroragov.org/cms/One.aspx?portalId=16242704&pageId=16599762>

### Centennial Gardens

These public gardens are one of Denver's best-kept secrets: five acres of native and water-wise plants in a formal display inspired by the gardens at Versailles, France. And they're smack in the middle of downtown Denver at 1101 Little Raven St. near the South Platte River, which is within walking distance of the Aquarium, Ball Arena, the Children's Museum, and Union Station. As one of the designers, Denver Botanic Gardens' Senior Curator and Director of Outreach Panayoti Kelaidis, explained in 2011, "I believe Centennial has more than achieved its dream." He added that there are "some novel plantings unlike anything else in the city. I am especially amazed to see how beautiful the buffalo grass (*Buchloë dactyloides*) has performed. It is trim and neat year 'round." More good news: the gardens are free to the public.

### Chatfield Farms

Nestled in the foothills southwest of Denver, Denver Botanic Gardens' Chatfield Farms is an oasis for wildlife, native plants, and sustainable agriculture. Aside from the acres set apart for food production, ▶



Fall colors of showy milkweed (*Asclepias speciosa*).  
 © Linda Smith

◀ the ornamental horticulture onsite is highly focused on native and climate-appropriate plantings. One of the first landscapes to welcome visitors to the site is a collection of lush prairie beds. Designed by Lauren Springer Ogden and Scott Ogden, the beds are divided by different growing conditions, which include the Rain Garden, North Slope, Dry Prairie, and Moist Meadow. Though not all plants within the prairie gardens are Colorado natives, they are all regionally native with no plants from outside of the contiguous US.

Set further back on the property, the Carol Gossard Colorado Native Plant Garden is situated in front of a historic barn and displays Colorado native species in an ornamental fashion. The WaterSmart Avenue and Plant Select demonstration gardens both feature numerous species of native plants as well. Outside of cultivated spaces, a walking trail weaves through a native riparian area to the edge of the property. Here, many native tree species thrive along with creatures like beavers, muskrats, prairie dogs, and birds of prey. Anyone looking for a reprieve from the city, or with an interest in horticulture, native plants, or learning about a sustainable working farm, would find Denver Botanic Gardens' Chatfield Farms to be a worthwhile visit. Take a stroll after picking up your plants from the CoNPS plant sale! Located near Chatfield State Park at 8500 W. Deer Creek Canyon Rd.

<https://www.botanicgardens.org/chatfield-farms/our-gardens>

### Denver Audubon Nature Center

Certified as a CoNPS Gold Garden in 2020, the Denver Audubon Nature Center features five different native and xeric demonstration areas, including a Colorado Native Plant Garden, Bird Feeder Garden, Bird Bath Garden, Bird House Garden, and Hummingbird Garden. Their extensive landscape of native plants gives sanctuary to resident woodpeckers, waxwings, blackbirds, jays, nuthatches, and sparrows, in addition to migratory warblers, buntings, tanagers, and hummingbirds. Other wild species roam in and out of the garden areas as well, where they find sources of food and shelter year-round with no fences or barriers. The gardens are at their height in mid-to-late June. There is no entrance fee, but donations for maintaining the location and purchasing new plant species are welcome. Open dawn to dusk, year-round. Located near Chatfield State Park at 11280 Waterton Rd

<https://denveraudubon.org/support-us/>

### Denver Botanic Gardens

Located at 1007 York Street, Denver Botanic Gardens is committed to showcasing regionally appropriate plants that are well adapted to the many variables of the Front Range climate. Gardens of the West, comprising 18 arid gardens, showcases plants that

thrive in Colorado's climate and provide color and texture all season long.

Native plants intermingle with classic garden favorites, and Plant Select introductions are in almost all the collections, however, several spaces that exclusively demonstrate native plant communities of the west.

Inside the entrance to the gardens, the Western Panoramas surround the grassy amphitheater. These gardens include the Ponderosa Border, Bristlecone Border, and Cottonwood Border, with each area magnificently showcasing a specific Colorado life zone and plant community, dominated by the overstory species. These naturalistic spaces are filled with tapestries of grasses, shrubs, and wildflowers, but they do require some supplemental irrigation throughout the season.

The Dryland Mesa and Sacred Earth gardens are south of the Monet Pool. It's quickly obvious that the plants here are adapted for arid conditions. These ▶



Native plants near the Denver Audubon Nature Center. Top: sulfur buckwheat (*Eriogonum umbellatum*) in the CoNPS Certified Native Plant Garden. Bottom: swallowtail butterfly on Rocky Mountain beebplant (*Cleomella serrulata*). © Kate Hogan



Native plant garden at DBG. © Denver Botanic Gardens

◀ dry gardens feature cacti, agave, yuccas, trees, and shrubs that are all suitable for our region. The Dryland Mesa Garden hasn't had supplemental irrigation in more than 20 years! The Sacred Earth Garden, to the east, is an educational display focused on plants important to indigenous people of the Four Corners region.

Near the western edge of the property, the Laura Smith Porter Plains Garden showcases the many different types of prairies found within Colorado. These include sand sage prairie and tallgrass prairie.

Denver Botanic Gardens is also home to the first publicly accessible green roof in the city of Denver. This green roof, installed in 2007, is a testing ground for growing plants atop buildings in a semi-arid environment. It includes more than 100 species of native, drought-tolerant plants.

Across York Street, the Mordecai Children's Garden is a vast display of Colorado's ecosystem. From riparian grasslands, all the way to alpine tundra and everything in between, it's built at a scale for tiny and tall people alike. <https://www.botanicgardens.org/york-street/our-gardens>

### **Ekar Farm Native Plant Demonstration Garden**

Ekar Farm is a nonprofit organization in Denver that engages volunteers and grows food for local food-justice and security organizations using regenerative farming methods. Recognizing that Ekar's sustainability ethos was a natural fit for native plant landscapes, Ekar's executive director, Jason Plotkin, invited the Front Range Chapter of Wild Ones (WOFR) to develop a small native plant demonstration garden on a corner of the farm in 2021. Ekar provides access to the roughly 900 square feet of growing space and has provided water for the space while the demonstration garden is being established.

The extremely hardy weeds onsite were smothered using cardboard and mulch; parts of the site were mulched with gravel and parts with crushed leaf litter. A group of WOFR volunteers began planting through the cardboard in the late summer and fall of 2021. Additional planting and, of course, weeding continued throughout the 2022 growing season. The final round of planting will take place during 2023. The farm retained some of the existing plants onsite that were planted using permaculture principles, so there are a few non-native plants in the garden. Native plants came from Harlequin Gardens, High Plains Environmental Center, Ekar plant donations, and from the WOFR propagation committee. A boulder and birdbath were purchased for the site, thanks to a grant from B'Nai Havaruh in Denver, to provide water for pollinators and birds.

The volunteer crew working onsite has had many opportunities to educate Ekar visitors and volunteers about the importance of native plants to biodiversity and climate resilience. And the garden is its own testament to biodiversity, with farm staff observing a greater abundance and diversity of insects and pollinators onsite. "At the close of the 2022 growing season, the garden was looking beautiful," said Ayn Schmit, board member at large of WOFR. In addition to adding the final plants to complete the garden this year, Ekar plans to install a sign to educate visitors about the importance of native landscapes, as well as applying for designations such as a Habitat Hero and CoNPS Certified Native Plant Garden.

Sundays are busy days, but still a great time to visit Ekar and see the demonstration garden, which is located on the western perimeter of the farm. Ekar will be hosting pick-your-own CSA shares and cut flower shares on Sundays. Ekar Farm is located on the northwest corner of East Alameda Avenue and Oneida Street in Denver, behind the Denver ▶



The Ekar Garden at the end of the 2022 growing season. © Ayn Schmit

◀ Academy of Torah. If you visit, be sure to park on Oneida Street and walk into the farm from there. <https://www.ekarfarm.org>

### Greenverein Garden at Denver Turnverein

The Greenverein Garden is a demonstration garden installed on the north side of the Turnverein building property. The garden was proposed by volunteers from Uptown on the Hill, a community organization that “connects residents and businesses and works toward improving the livability of the neighborhood.” What was once an asphalt-covered strip at the corner of 16th and Clarkson has been transformed into a low-maintenance demonstration garden to be enjoyed by the community and visitors.

To make the garden a reality, the community began fundraising in 2018. In spring 2019, the asphalt was removed, and three street trees were planted. In June 2019, volunteers began planting low-water shrubs, perennials, and grasses. Volunteer Christine Gust, a member of Denver Turnverein and Wild Ones, thought the garden could also be home to native plants that would thrive in the heavily compacted clay.

Volunteers worked to create a system to capture rainwater for irrigation, as well as a network of

trenches filled with rock to allow water to flow to all areas of the garden. They built berms and installed hardscape, which consisted of broken concrete, free boulders, river rock, cobbles, pea gravel, and weathered cottonwood stumps.

Visitors to the Greenverein Garden are likely to see native plants donated by Wild Ones members and some shrubs and perennials purchased at local nurseries. For more information, see <https://www.YouTube.com/watch?v=VXvgnrK4Wdw>

### High Plains Environmental Center

The gardens at High Plains Environmental Center (HPEC) in Loveland are an ongoing endeavor, built and maintained entirely by HPEC staff and volunteers. According to Jim Tolstrup, executive director, the gardens demonstrate the importance of native plants that benefit pollinators, birds, and other wildlife while also reducing or eliminating the need for pesticides, fertilizers, and irrigation.

Featured gardens include a large bioswale and water-quality pond, an ethnobotany exhibit showcasing plants used by tribes of the High Plains, a native plant nursery that produces 120 species of prairie and Rocky Mountain plants, and extensive native/pollinator gardens, as well as community garden plots and an heirloom fruit orchard. Visit the gardens at 2698 Bluestem Willow Dr, Loveland. <http://www.suburbitat.org/>

### Houston Gardens

Located at 515 23rd Avenue in Greeley, the Houston Gardens property has a storied history, from its origins as farmland in short grass prairie to its eventual transformation into a botanic garden and nature center. Houston Gardens was established as a mountain and plains retreat in an urban area, and it functions as an educational resource center for any person or group with an interest in the natural environment.

The gardens feature 4.3 acres of natural trails and ecosystem types found in Colorado—montane, subalpine, foothills, shrubland, and prairie. As visitors walk through each section, they’ll see scenery gradually change to trees, shrubs, and bushes native to that ecosystem. Walking paths are handicapped-accessible.

There are ponds, a flowing creek, an Eagle Scout trail, and a myriad of flora species. Visitors may also see native mammals and birds in the gardens.

Educational workshops are available for the urban gardener and small-acreage landowners, with topics as varied as irrigation, soil health, native planting, xeriscaping, and more. <http://www.wgcd.org/houston-gardens/> ▶



Before planting of the Greenverein Garden (top) and after (bottom). From *Wild Ones Journal* (2021) 34.1:29-32. <https://wildones.org/wp-content/images/2021Vol34No1Journal-LOW-RES.pdf>

## ◀ Majestic View Nature Center

Visitors are encouraged to explore, discover, and learn at Majestic View Nature Center, Arvada's environmental education facility. Situated on 83 acres, interior and exterior interpretive displays, trails, programs, and a demonstration garden connect people of all ages to their environment through informal and formal environmental learning opportunities.

At any time of year, one of the first things visitors notice when they arrive at the nature center is the 25,000 square-foot demonstration garden that surrounds the building. There are eight distinct zones in the garden, each showcasing native and regionally appropriate plants that provide nesting space and materials, habitat, and food for wildlife: dry shade, native prairie grass, ornamental grass, habitat hedgerow, pollinator, bird, succulent, and perennial border zones. Visitors will notice that the pollinators, birds, and other wildlife are not limited to those particular zones in the garden; in fact, they can be found in every zone, since there are ample plants spread throughout the area to meet their needs. In 2021, the demonstration garden was named a Certified Wildlife Habitat by the National Wildlife Federation.

Jessica Colby, assistant nature center director, notes “we want visitors to Majestic View Nature Center to deepen their connection to the natural world and recognize that—even in an urban setting—we are a part of a rich ecological tapestry. By using native plants whenever possible, not only do we minimize our water usage, but we also aim to highlight the relationship between the plants and the native pollinators that rely on them and the human relationship with the land.”

To promote the benefits and beauty of incorporating native grasses, forbs, shrubs, and trees, in 2021 the Majestic View Nature Center hosted the first annual



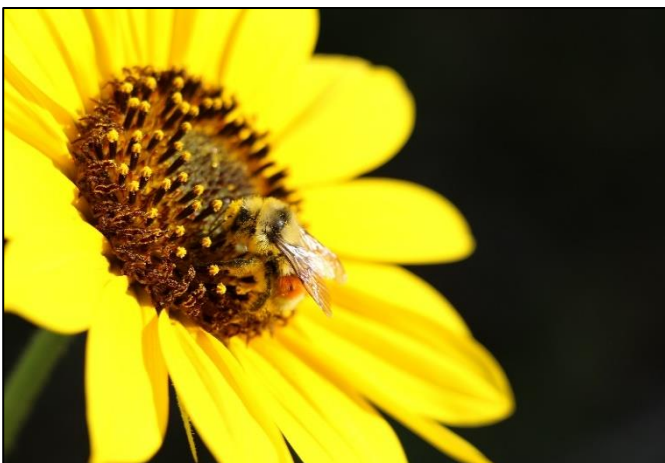
Before (top) and after (bottom) photos of the transformation of Majestic View Nature Center.  
© City of Arvada

Arvada Pollinator Garden Tour. This tour serves to provide more examples of pollinator-friendly possibilities by highlighting gardens of all shapes, sizes, and budgets throughout the city. Applications for this year's tour will be accepted May 1–31. Majestic View Nature Center is located at 7030 Garrison Street in Arvada. The outdoor areas are open year-round from dawn to dusk.  
<https://majesticviewnaturecenter.arvada.org/>

### Manitou Pollinators Garden

The Manitou Pollinators have been creating a pollinator/native plant demonstration garden in Mansions Park, in Manitou Springs. According to Melody Daugherty, executive director and co-founder, “This native garden is one of our best natural teachers for our small Rocky Mountain town. Each year, we introduce more ‘natives’ to show how these incredible, tough plants create not only pollinator habitat but seasonal beauty as well!”

Daugherty invites the public to stop and enjoy Manitou Springs, which was recently designated as the [world's first Certified Pollinator District](#). She says the town is actively transitioning to native, drought-tolerant ▶



A bumblebee on a sunflower (*Helianthus annuus*) at Majestic View Nature Center. © City of Arvada

◀ plants as a requirement to receive the certification, which she feels should be a goal for all Colorado municipalities as a solution to climate change and rapidly dwindling pollinator populations. Many thanks go to volunteers from the CoNPS southeast chapter who ran extensive plant inventories in three Manitou open spaces throughout 2022 to meet the qualifications for the pollinator district certification. <https://manitoupollinators.org/>

### Nix Native Plant Garden

The Nix Native Plant Garden surrounds the City of Fort Collins Natural Areas Department offices. The property was first homesteaded in 1889 and farmed by several owners until the city purchased it in 1996 from Tom and Patsy Nix. The area has been designated a Local Historic District.

The native plants at the farm support the department's goal to conserve, restore, and enhance native plant and animal communities. Most of the landscaping around the farmhouse was planted in 2002, and the plants surrounding the main office were installed in 2014. The garden showcases how native plants can rival the attractiveness of typical non-native landscape plant choices while creating habitat in an urban setting. Plants are labeled "Fort Collins Native" or "Colorado Native."

Collections include Hidden Garden, Grassland Garden, Hidden Habitats, Fruit Garden, Prairie Bouquet, Water Garden, Rock Garden, Butterfly Garden, Boulder Stream Garden, Walkway Garden, Patio Garden, North and East Parking Lot Gardens, and Shop Perimeter Garden.

The garden provides food, water, cover, and shelter to a variety of wildlife. Butterflies, cottontail rabbits, deer, foxes, raccoons, snakes, fox squirrels, and a large variety of birds are typical visitors to the garden.

The garden is located at 1745 Hoffman Mill Road via the Poudre Trail between Timberline and Lemay. Parking is available. Take a stroll after picking up your plants from the CoNPS plant sale! Contact the department at 970-416-2815 or [naturalareas@fcgov.com](mailto:naturalareas@fcgov.com). <https://www.fcgov.com/naturalareas/pdf/native-plant-garden2015.pdf>

### River's Edge Natural Area

River's Edge Natural Area is a Larimer County open-space property, with 3.8 miles of trails and five ponds on the 163-acre property. CoNPS volunteers, community members, and Open Lands staff planted the demonstration gardens here (see *Aquilegia* 2019 43.4:21–22 for more details), which include numerous forbs, grasses, bushes, and trees. See <https://rena-demo-gardens.tumblr.com/> for detailed information on each of the plants at this location.

### Rocky Mountain Botanic Gardens

The Rocky Mountain Botanic Gardens in Lyons features native plants from different Colorado ecosystems: prairie grassland, foothills, montane, southwest, and riparian. Each habitat features trees, shrubs, grasses, perennials, and annuals. See *Aquilegia* 2022 46.4:15-16 for a report from a field trip to the gardens at last year's annual conference. <http://www.rmbg.org/>

### The Gardens on Spring Creek

In the late 1980s, a botanical center for the greater Fort Collins area was nothing more than a harebrained dream. Envisioned by Jim Clark and a few other forward-thinking horticultural and regional leaders, the idea was, at least in part, sparked by a visit to the Cheyenne Botanic Gardens.

If a small city of 50,000 people could sustain a botanic feature, why couldn't Fort Collins, a city more than 50 percent larger by population—and growing quickly—that boasted a land-grant university emphasizing agriculture? The Gardens on Spring Creek, the direct result of this idea, opened its doors in 2004. Little more than a visitor center and entry garden consisting of mostly annuals, the facility continued fundraising, opening a popular Children's Garden by 2006. The rest has been history, punctuated by the notable expansion of the organization's gardens in 2017–18 to fill the site, as was envisioned in the original master plan.

These forward-thinking designs included food gardens—quickly growing in popularity—as well as xeric and native plant gardens designed to showcase plant material by elevation, from prairies to peaks. These gardens, all distinct in focus, share similar emphases: all are naturalistic, feature environmentally responsible horticulture, and are designed to showcase underused and attractive plant material with a high degree of wildlife value. Two sister gardens, the Prairie and ▶



The Undaunted Garden at the Gardens on Spring Creek. © City of Fort Collins



Foothills Garden at the Gardens on Spring Creek.  
© City of Fort Collins

◀ Foothills gardens, represent native-only spaces, while others, such as the notable Undaunted Garden and Rock Garden, include large numbers of native plants deserving wider use that are interplanted with complementary, regionally adapted plants.

Plants originating in the lowest elevation in our region are featured in the Prairie Garden, a matrix-style meadow garden designed and managed by Bryan Fischer, curator of plant collections. The garden features more than 100 taxa grouped in three plant communities—shortgrass prairie, midgrass prairie, and tallgrass prairie—over almost half an acre. Bryan noted, “This space almost exclusively comprises herbaceous plant material, utilizing a highly naturalistic design and large, color-coordinated displays of complementary textured plants to create a unique and serene feel.”

Immediately to the north of the Prairie Garden sits its sister space, the Foothills Garden. Featuring plants from an elevation of 5,500 feet to just over 8,000 feet, the space emulates the Rocky Mountain Front Range shrubby ecosystem, with around 300 taxa to date. In addition to several winding paths, the Foothills Garden is home to a notable assemblage of native woody plants.

South of these gardens sits what many consider to be the flagship garden of the property. A three-quarter-acre oval berm, the Undaunted Garden is a showcase for the work of notable horticulturist Lauren Springer Ogden. Saturated in natives, the garden features many unusual species presented in Springer’s unrivaled naturalistic design style. Notable in this space are the dozens of hard-to-find taxa, making up one of the largest displays of USDA Zone 5 hardy cacti in the region, many of which were grown from seed by staff, and a sleeper collection of woody plants in a chaparral style.

The oldest of the site’s naturalistic gardens, the Rock Garden, showcases plant material from 8,000 feet and above, as well as petite plant material (under one foot in height). Here, visitors find displays of blooming cushion plants and xeric perennials in garden rooms divided by tastefully arranged, primarily native woody plants, including native dwarf conifers, many of which are from the iconic Laporte Avenue Nursery.

Across 12 acres of property, the Gardens on Spring Creek presents one of the largest collections of garden-displayed native plants found in our region on a public site. Visitors can find natives easily, both in naturalistic gardens and other spaces on the grounds, thanks to a Plant Explorer feature on the organization’s website and new, metal plant identification signage that is being deployed across the grounds this season and next. By fall of 2024, staff are on track to have all major collections marked with signage and available for public search in the Garden Explorer tab on the gardens’ website. Until then, would-be visitors are encouraged to read about the organization or gardens at their website: <https://www.fcgov.com/gardens/>, or to stop by, experience the site for themselves, and ask a horticulturist directly about their work there.

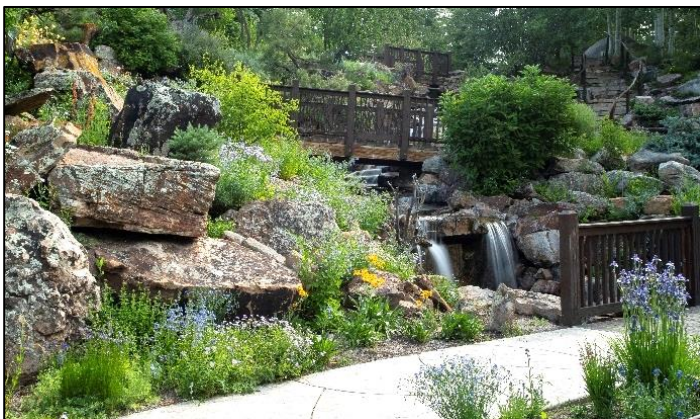
## Intramountain Gardens

### Betty Ford Alpine Gardens

Founded in 1985 by the Vail Alpine Garden Foundation and named in 1988 in honor of former First Lady Betty Ford, the mission of Betty Ford Alpine Gardens is “to deepen understanding and promote conservation of alpine plants and fragile mountain environments.” Located at 8,200 feet in Vail, Betty Ford Alpine Gardens is the highest-elevation botanical garden in North America. Because of its location, it is uniquely suited to growing plants from mountain environments. Different collections represent the montane drylands, subalpine forests, and alpine plant communities.

Here you’ll see a “trembling forest,” so named because of the aspens (*Populus tremuloides*). The crevice garden is filled with alpine plants that live in the most severe conditions and have similar survival strategies. The wetlands area, which includes grass-like sedges and rushes, provides habitat for a wide variety of animals.

Alpine species from Colorado make up the Alpines of Colorado collection, currently with more than 90 species of alpine plants. This garden is nationally accredited by the American Public Gardens Association. More plants are added each year from seed collecting through the North American Botanic Garden Strategy for Alpine Plant Conservation. ▶



Streamside wildflowers at the Betty Ford Alpine Gardens. © Todd Winslow Pierce

◀ In addition, some of Colorado's rare and endemic plants are grown in troughs throughout the gardens. Several of these species are current and previous subjects of conservation work conducted by the gardens.

Vail's high elevation and cold, dry climate make it possible for Betty Ford Alpine Gardens to also grow alpine plants from all over the world, including South Africa, the European Alps, the Caucasus, Central Asia and the Silk Road, and the Himalayas.

As a botanic garden, Betty Ford Alpine Gardens is at the intersection of science and the public and they are proud to be able to show visitors amazing native Colorado flora that they would never otherwise see outside of a strenuous alpine adventure. The outdoor gardens are open daily from dawn to dusk, and the Education Center is open daily from 10 AM to 4 PM. Visit on your own or join a CoNPS field trip on July 16. For more information, visit their website at <http://bettyfordalpinegardens.org/>



The gate welcoming visitors to the Betty Ford Alpine Gardens. © Todd Winslow Pierce

## Crested Butte Botanic Gardens

Established as an organization in July 2022, Crested Butte Botanic Gardens in Gunnison County is currently in the strategic planning phase. Members of the founding organization are currently seeking a permanent location. Even so, they are reaching out to the community through educational programming and projects.

Through a collaboration with Crested Butte Parks and Recreation, the organization plans to install a native garden at one of the town's parks this summer. The garden will be an educational display of all native plants, designed to inform visitors about the plants' importance and their role in the fragile ecosystem at 9,000 feet.

Although the organization's website is not yet complete, it will inspire people of all ages and abilities to look forward to a meaningful experience at Crested Butte Botanic Gardens. <http://crestedbuttegardens.org/>

## Herbert E. Owen Native Plants Garden and Outdoor Classroom

Herbert E. Owen, the "father" of the biology department at Fort Lewis College in Durango, had a vision of sharing a garden that featured plants that grow naturally across the Four Corners. Thirty-five years after Owen's retirement, the dream became a reality with the help of Preston Somers.

The garden was first planted in 2000 at the site of the current Sitter Family Hall. It featured plants donated from native plant nurseries around Colorado, as well as from other sources. The garden was relocated in 2012 to a 0.36-acre plot behind the biology wing of Berndt Hall. All plants in the garden are ones that have been or are still used medicinally and ceremonially by Native Americans. ▶



Penstemons and other natives near the front walk of Mrs. Walsh's Garden. © Robin Howard





The cactus garden at Mrs. Walsh's Garden.  
© Robin Howard

◀ “It’s wild, it’s messy, but that’s nature; that’s the beauty of the garden,” as garden caretaker and Biology Lab Coordinator Kami Parrish-Larson put it.

Members of the community, students, and faculty all enjoy the garden, and some help participate in its care. Faculty members often use the garden to show students plant adaptations. Visitors may even experience seeing signage covered with post-it notes, suggesting an “ambulatory pop quiz.”

<https://www.fortlewis.edu/fort-lewis-college-news/news-detail/herbert-e-owen-native-plants-garden-outdoor-classroom>

### Mrs. Walsh’s Garden

Mrs. Walsh’s Garden in Estes Park was established in the mid-1990s by Judy Lamy to honor her grandmother, Winifred “Peggy” Walsh. Walsh was the daughter of a US Cavalry officer of the frontier west. The Walshes were early residents of Estes Park.

The original mission of the garden was to be “a source of pleasure, education, and inspiration by demonstrating the use of plants native to Estes Park and surrounding Rocky Mountain region.” The Lamy family endowed the land to the Community Foundation Trust of Northern Colorado for maintenance obligations and financial stability.

In 2017, the Community Foundation Trust donated the property to the town of Estes Park, a gift during the centennial celebration of Estes Park’s incorporation. A covenant ensures the garden will continue to be used as a demonstration xeriscape garden for plants native to the Rocky Mountain region. An endowment from

the Community Foundation Trust provides funding to the town for annual maintenance and repair costs.

Today, the Estes Park parks division manages the property, with the help of the Mrs. Walsh’s Garden committee, a volunteer citizens group. The two organizations completed a master plan for the garden in 2020, making reconstruction of the iconic pond area a top priority. This area, destroyed during the 2013 flood, was reconstructed in 2021. This year, the town will build a new pond at the garden’s entrance, which should be complete for guests to enjoy this summer.

Mrs. Walsh’s Garden is located on West Elkhorn Avenue across from Performance Park’s parking lot. The garden is open to the public, from sunrise to sunset 365 days a year. For more information, visit [www.estes.org/mrs-walshs-garden](http://www.estes.org/mrs-walshs-garden) or contact Brian Berg, public works parks division supervisor, at 970-577-3783 or [bberg@estes.org](mailto:bberg@estes.org).

### Yampa River Botanic Park

Situated in north-central Colorado and nestled in the Yampa Valley at just under 7,000 feet elevation, the Steamboat Springs’ Yampa River Botanic Park has the unique opportunity to showcase an abundance of Colorado’s native flora, spanning all the way from the alpine to the plains. Gardens of many different themes fill the six-acre botanical garden, and although Colorado’s natives make an appearance in each garden in some capacity, a few of those gardens are collections of strictly native plants.

A description of the gardens was provided by Emma Friedland, lead horticulturist for the park. One of these collections is Dorothy’s Garden, a sloped, south- and southwest-facing native garden, making it a perfect area to display plants found in Colorado’s meadows and in hot, sunny rock outcrops. Another collection is the High Country Natives Garden, a north-facing site on the opposite end of the park and a woodland display of flora, capturing the feel of some of the montane hikes that surround Routt County. Another garden of particular interest is the Medicinal Garden, a collection of plants native to the Rocky Mountains that have been used throughout history by Colorado’s indigenous communities. Although it is in these specific gardens where the highest density of native plants in the Yampa River Botanic Park can be found, there are Colorado native plants mixed among others in almost every other garden onsite.

“Beauty and toughness come together in perfect harmony in Colorado’s native plants,” Friedland said, “and the Botanic Park is honored to continue its collection and display of these gems for the purposes of education, conservation, and the delight of visitors, both human and wildlife.”

<https://www.yampariverbotanicpark.org/> ▶



Mountain ball cactus (*Pediocactus simpsonii*) at the Yampa River Botanic Park. © Gayle Lehman



Sculpture in the medicinal garden at the Yampa River Botanic Garden. © Jeff Morehead

## ◀ Western Slope Gardens

### Montrose Botanic Gardens

One of seven gardens in Montrose Botanic Gardens, the Native Garden is in the xeriscape educational area. Built in 2005, this garden has an unobstructed view of the San Juan Mountains to the south. All plants are native to Colorado, with some that cross borders between Utah and Arizona. Although native

plants can be a challenge to grow, Montrose Botanic Gardens aims to show their durability and beauty while using less water, a precious resource.

The Rock Garden, also within the Xeriscape educational area, was constructed in 2004-2005 with over 200 tons of native Shavano sandstone boulders. A 40-foot-long water feature meanders through the Rock Garden, with plants growing along the rim edges and along the rock slopes. Plants in this garden are both native and non-native. There are also deciduous and evergreen shrubs, along with six species of midsize trees.

Located at 1800 Pavilion Dr., the Montrose Botanic Gardens is open to the public every day from dawn until dusk unless a private event has been scheduled. <https://www.montrosegardens.org/> 🌀



### ◀ "Native Gardens..." continued from page 6

entrance also features a round courtyard with a variety of garden beds with natives and cultivars—all with plant stakes to educate visitors. Note that the visitor center, but not the gardens, will be closed through mid-May to repair floor damage.

Below are some other gardens in the western half of Colorado that also feature native plants. For a complete list of demonstration gardens featuring native plants throughout Colorado, see <https://conps.org/native-plant-demonstration-gardens/>

- Betty Ford Alpine Gardens, Vail
- Black Canyon of the Gunnison National Park, Montrose
- Colorado National Monument, Grand Junction
- Cortez Cultural Center (native plants identified in landscapes), Cortez
- Dinosaur National Monument, Jensen, Utah
- Durango Public Library and Durango Botanic Gardens, Durango

- Fort Uncompahgre's Pioneer Garden at Confluence Park, Delta
- Herbert E. Owen Native Plants Garden at Fort Lewis College, Durango
- Mesa Verde National Park, Mesa Verde
- Native and xeriscape gardens at the Montrose Botanic Gardens, Montrose
- Southern Ute Cultural Center and Museum Native Garden, Ignacio
- Western Colorado Botanical Gardens, Grand Junction

*CoNPS members Mary Menz and Jim Pizarowicz are the authors of Wildflowers of Colorado's Western Slope (available in May 2023) and Common Wildflowers of the San Juan Mountains. Menz is a writer and Native Plant Master. She lives in Ridgway and flower-finds with family and friends all over the Western Slope. Pizarowicz lives in Montrose with his wife and dogs. He photographs plants in all seasons across the state and beyond. You can reach Mary at [mary.t.menz@gmail.com](mailto:mary.t.menz@gmail.com) and Jim at [jim.pizarowicz@gmail.com](mailto:jim.pizarowicz@gmail.com). 🌀*

## Research and Reports

### All Pollinators Are Not Created Equal: Evaluating Pollination Efficiency Using a Colorado Montane Pollination System

By Brendan Connolly

CoNPS annually funds grants to support field and laboratory research and as part of its John W. Marr, Myrna P. Steinkamp, and Mission grant programs. Reporting on projects is a requirement of all grant recipients. In this issue, we are pleased to feature the three following reports.

**Research Background:** Pollinators are essential for reproduction in most flowering plants (1). Therefore, the pollinator species will largely determine the *quantity* and *quality* of seeds that a plant produces, with *quality* largely indicated by the genetic diversity of seedlings. Importantly, more genetically diverse populations contain a variety of genes, which can increase tolerance to environmental changes (2,3). However, the risk of plant population declines due to climate change is further compounded by global pollinator declines. Despite the importance of measuring the *quality* of pollination through the genetic diversity of offspring, few studies consider this component, with even fewer examining how individual pollinator species differ (4). Until this research gap is filled, inferences about pollinator importance may continue to be misattributed, possibly resulting in ineffective conservation decisions.

To address these issues, I conducted research at the Rocky Mountain Biological Laboratory (RMBL), in Gothic, in summer 2022 with support from the Colorado Native Plant Society's John Marr Grant. My research investigated the differences in pollination efficiency among the pollinators of *Delphinium nuttallianum* (Nuttall's larkspur, Figure 1). *D. nuttallianum* is a perennial endemic to montane meadows in Colorado, blooming shortly after snowmelt. It is pollinated by one hummingbird species and several bumblebee species, each of which differs in foraging ranges and floral specificity, which has implications for the quantity and quality of both the pollen delivered and seeds produced. Specifically, my measurements of pollination quantity were the amount of pollen grains deposited and seed set from individual fruits. Pollination quality measurements included seed viability rate, germination rate, genetic diversity of offspring, and fitness of offspring.

To isolate the effects of different pollinators, I used tulle, clothespins, and bamboo skewers to construct pollinator exclusion cages around individual *D. nuttallianum* plants so that plants would only be pollinated when being observed. Cages were installed before plants bloomed and removed only when

conducting pollinator observations. During observations, I would watch one or two plants at a time from a distance of approximately 10 meters away. As soon as a pollinator approached one of ▶



Figure 1. Top: *Delphinium nuttallianum* (Ranunculaceae) being visited by a *Bombus flavifrons* queen at the RMBL. Middle: *Delphinium nuttallianum* in a pollinator exclusion cage at the RMBL. Bottom: The author constructing pollinator exclusion cages for *Delphinium nuttallianum* at the RMBL.  
© Brendan Connolly 2022

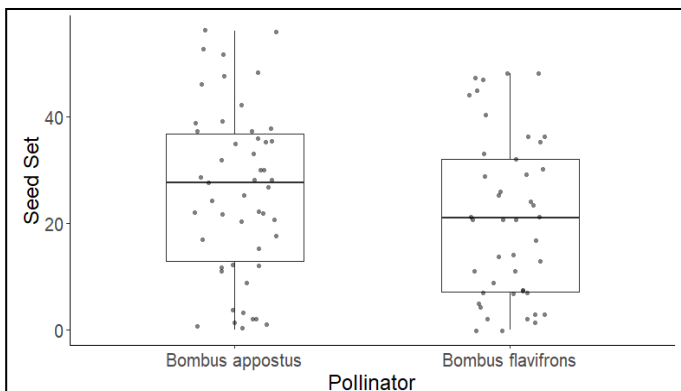


Figure 2. Differences in seed set as a result of pollination by *B. appositus* and *B. flavifrons*. There was no significant difference in seed set ( $t = 1.50$ ,  $df = 98$ ,  $p = 0.14$ ), although there was a trend of *B. appositus* pollination resulting in greater seed set (mean = 25.49, SD = 15.92) than *B. flavifrons* pollination (mean = 20.88, SD = 14.83).

◀ my focal plants, it would be identified using binoculars, and the individual flowers that were visited would be recorded. Plants were then promptly recaged after a pollinator visited flowers, and fruits were collected at the end of the season.

**Preliminary Results:** By the end of the field season, I had observed 100 pollination events across two bumblebee species (*Bombus appositus* and *Bombus flavifrons*) that resulted in fruits. Pollination resulting from broad-tailed hummingbirds (*Selasphorus platycercus*) and a third bumblebee species, *Bombus californicus*, was also documented but excluded from analyses due to low sample sizes. Analyses are currently ongoing, but initial analyses found that seed set did not significantly differ between the two bumblebee species ( $t = 1.50$ ,  $df = 98$ ,  $p = 0.14$ ; Figure 2), although there was a nonsignificant trend in which *B. appositus* pollination resulted in a greater seed set.

However, seed viability rates did differ significantly. The smaller, more generalist bee species, *B. flavifrons*, produced a greater percentage of viable seeds per pollination event than the larger, more specialized bee, *B. appositus* ( $W = 704.50$ ,  $p = 0.014$ ; Figure 3). These initial results were surprising, as I had hypothesized a single pollination event from *B. appositus* would deposit more *Delphinium* pollen grains, which would result in greater seed sets and viability rates compared to pollination by *B. flavifrons*. This hypothesis was generated because *B. appositus* is a highly specialized forager, almost exclusively visiting *D. nuttallianum* flowers, and is larger on average than *B. flavifrons* (5). Thus, I assumed *B. appositus* would have longer foraging distances and be able to carry more pollen (6,7). One possible explanation for these unexpected results is that the larger foraging range of *B. appositus* might result in

deposition of pollen that is more genetically distant, resulting in out-breeding depression, where plants become ill-adapted to their local environment (8). Additional data collection and analyses will be conducted in the coming months to further explore the quality measurements of pollination efficiency.

**Continuing Research Plans:** I plan to continue data collection and analysis in 2023 to further explore differences in the quantity and quality of pollination efficiency of the two bumblebee species. Specifically, I will measure the amount of conspecific pollen grains deposited onto stigmas during the summer, the genetic diversity of parents and offspring, extent of inbreeding of offspring, and the fitness of offspring. All seeds that were collected in 2022 are in moist, cold-stratification and will be germinated in 2023.

Once seeds germinate, I will choose a subset of 10 seedlings per maternal line to grow in a greenhouse setting at the Chicago Botanic Garden. Survival, growth rate, and biomass will then be measured over an approximately 10-week period, after which leaf tissue samples from parents and offspring will be genetically sequenced using the double digest RADseq technique (9) and the amplicon technique (10). Sequencing will allow me to determine the genetic diversity of the seedlings produced by the two bumblebee species, and to estimate how far the two pollinators traveled. In sum, I plan to have finished data collection and analyses by the end of 2023, and submit my research for publication in early 2024, shortly before I graduate from my MS program.

**Significance of Research to Colorado Native Plants:** Understanding how different pollinators contribute to plant reproduction and genetic diversity is at the center of understanding their population dynamics, persistence, and conservation. This study

Pollinators...” continued on page 24 ►

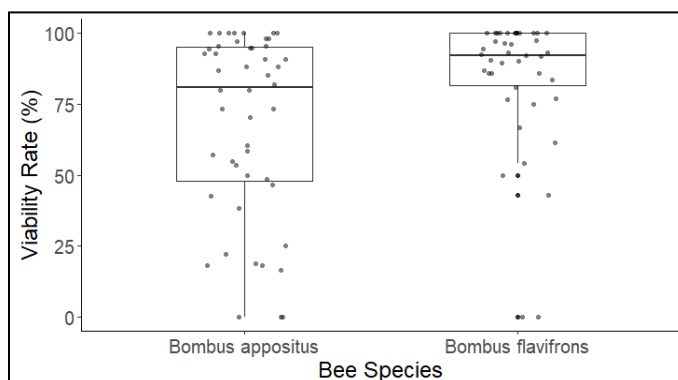


Figure 3. Differences in seed viability rate per fruit due to pollination by *B. appositus* versus *B. flavifrons*. There was a significant difference in seed viability rates ( $W = 704.50$ ,  $p = 0.014$ ), with pollination by *B. flavifrons* (mean = 83.95%, SD = 23.91) resulting in greater viability rates than *B. appositus* pollination (mean = 68.15%, SD = 32.25).

# Research and Reports

## The Reproductive Ecology of *Astragalus microcymbus*

By Bronwyn Taylor, Hannah Carroll, and Robin Bingham

Endemism occurs when an organism lives only in one geographical location, and nowhere else on Earth. An endemic species may be locally abundant, meaning that it has a large population spread over a relatively narrow geographic range; or it may be locally rare, meaning that there is a relatively small population living within that narrow geographic range. Rare endemic taxa may be especially vulnerable to habitat loss and the challenges of climate change due to their limited geographical distribution, small and sometimes discontinuous populations, and narrow gene pools (1,2). Effective protection of rare endemics requires a thorough understanding of their reproductive biology and broader ecology (3,4). From the fertilization of an ovule to the germination of a seed, the reproductive cycle of a plant is composed of many different processes. Interference with any component of these processes has the potential to contribute to a species' imperilment (4,5).

*Astragalus microcymbus* Barneby (Fabaceae) is a rare endemic native to the sagebrush steppe of Gunnison County in western Colorado. Its common name, skiff milkvetch, refers to its fruits, which are tiny boat-shaped pods with green and red patterning. *A. microcymbus* experiences high interannual variation in reproduction, with years of high reproduction correlating with high winter precipitation and moderate temperatures during spring and summer (6). It is ranked as critically imperiled by the Colorado Natural Heritage Program, and from 2010 to 2019 was a candidate for listing under the Endangered Species Act. Although its listing was ultimately denied, threats to this species, including recreation, mammal herbivory, invasive annual species, and climate change, are present and growing (7).

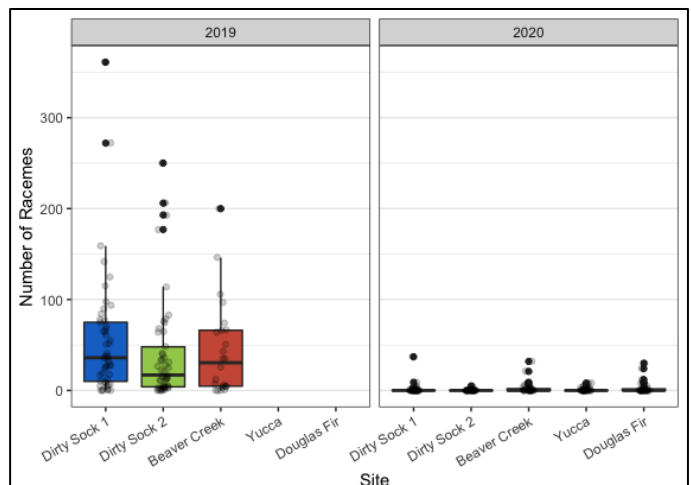
In this study, we set out to describe the life history components of *A. microcymbus*, including its reproductive success, pollination ecology, and post-primary dispersal seed ecology. We addressed the following questions:

- What is the reproductive success of *A. microcymbus* as measured by fruit to flower and seed to ovule ratios?
- Does reproductive success vary across sites, and, if so, what factors influence its reproductive success?
- Does *A. microcymbus* require pollinators for successful seed set? If so, what are its primary pollinators?

- Does *A. microcymbus* have a viable soil seed bank, and how does it vary across the landscape?
- Can insight into the secondary dispersal mechanisms and occurrence patterns of *A. microcymbus* be gained by the distribution of the seed bank and individuals?

The answers to these questions are critical for managing *A. microcymbus* habitat and protecting its fragile gene pool.

This research was conducted from 2019 to 2021 across five sites in the South Beaver Creek Area of Critical Environmental Concern in Gunnison County. To describe reproductive success, in 2019 and 2020 we quantified reproduction and estimated fruit and seed set using raceme, flower, seed, and ovule counts, and seed viability testing. We also monitored and observed mammal herbivory. To describe the pollination ecology, we conducted pollinator exclusion experiments in 2020 to inform our understanding of its breeding system. In addition, we made insect behavior observations and identified visiting insects. To describe the post-primary dispersal seed ecology, in 2020 we collected soil samples at 0.0 meters, 0.5 meters, and 1.0 meter downhill from *A. microcymbus* plants, described the above-ground microhabitat characteristics of collected samples using percent cover estimates, extracted *A. microcymbus* seeds present in soil samples, and tested the recovered ►



**Figure 1.** Differences in reproduction between 2019 and 2020. In 2019, the number of racemes per plant was correlated with the number of flowers and fruits per plant. These counts were taken from June 30 to July 11 each year. The X-axis indicates the site name.

◀ seeds for viability. We also described microhabitat characteristics of established plants in 2020 and 2021 using distance measurements and percent cover estimates. All seedlings from the reproductive success and soil seed bank viability tests (total of 156) were donated to the Denver Botanic Gardens in May 2021.

In 2019, *A. microcymbus* had a high reproductive year, followed by a low reproductive year in 2020 (Figure 1). In 2019, the average number of flowers counted per plant across the three sites was 893, and the average number of fruits per plant was 205. Although flowering effort was high, fairly low fruit and seed set was observed. The average fruit-to-flower ratio (the ratio of flowers that develop into fruit) ranged from 0.25 to 0.30. The average seed-to-ovule ratio (the ratio of ovules that develop into mature seeds) was 0.29. Across the collected fruit, the average number of seeds per fruit was 1.17, the average number of aborted seeds per fruit was 1.39, the average number of undeveloped ovules per fruit was 1.53, and the average total ovules per fruit (all ovules observed including filled seed, aborted seeds, and undeveloped ovules) was 4.1. Based on germination trials and seed viability tests, 89 percent of the collected seeds were viable. The estimated average number of seeds produced per plant (not adjusted for viability) was 242.

In 2020, plants experienced very low reproduction due to rabbit herbivory and drought. Based on our limited data set, we estimated the fruit to flower ratio across the five studied sites to be 0.14. By July 15, 85% of the studied plants exhibited high levels of herbivory (more than half of the main stems were grazed to 15 cm or less, or more than half of the vegetative growth was grazed). Eighty-four percent of these plants exhibited clear diagonal bite marks, indicating rodent or rabbit herbivory.

Due to dry conditions and the impacts of herbivory in 2020, we were not able to conduct a successful pollinator-exclusion experiment. However, we did



**Figure 3.** *Ashmeadiella* sp. visiting *A. microcymbus* flowers and eliciting the pollination mechanism. © Bronwyn Taylor

successfully identify several insect visitors. Two genera of solitary bees, including the species *Ashmeadiella sculleni*, *Ashmeadiella lutzi*, *Ashmeadiella cactorum*, and *Anthidium emarginatum*, were observed eliciting the pollination mechanism (tripping the keel of the corolla and accessing the anthers) of *A. microcymbus* flowers. Other insects observed visiting the flowers, but not eliciting the pollination mechanism, included two smaller species of solitary bees (*Ceratina nanula* and *Lasioglossum* sp.); Melissa blue butterflies (*Plebejus melissa*); and flies in the genus *Geron*.

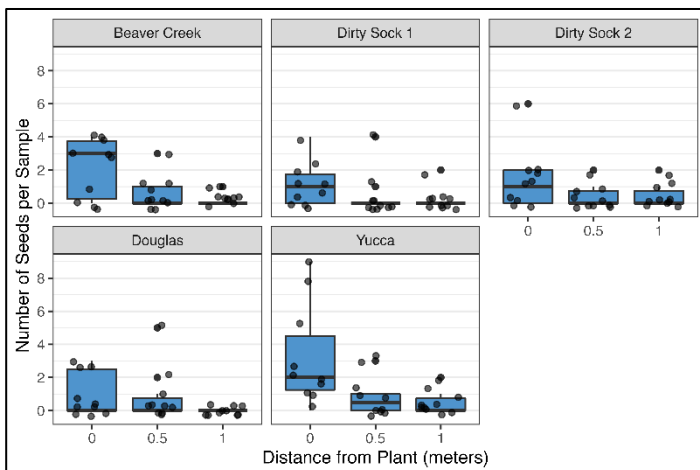
At all study sites in both years, viable soil seed banks were found, which decreased in density with increasing downslope distance from the sampled plant. Across the studied sites, the average number of seeds found per plant was 1.80 at 0.0 meters, 0.64 at 0.5 meters, and 1.0 at 1 meter. At the intermediate distance from the parent plant (0.5 m), fewer seeds were found in microsites with higher bare ground exposure, and more seeds were found in microsites with rocks and vegetation. Based on germination and tetrazolium tests, 81% of the seeds extracted from soil samples were viable. Established plants occurred in areas closer to vegetation and with higher vegetation cover, suggesting that the species is more likely to be successful when seeds germinate adjacent to “nurse plants.”

### Management Implications

*Astragalus microcymbus* reproduction is closely tied to climatic factors, and may be threatened by anthropogenic climate change (6,7). Although limited, there are several management strategies that can be implemented. ▶



**Figure 2.** A mountain cottontail rabbit observed grazing an *A. microcymbus* plant on August 8, 2020. The plant is located at the base of the sagebrush, and a branch can be seen in the rabbit's mouth.



**Figure 4.** The number of seeds found per soil sample (395.84 cubic centimeters) at 0 m, 0.5 m, and 1.0 m from the focal plant.

◀ First, managing the impacts of rabbit and other small mammal herbivory would benefit *A. microcymbus* reproduction. Our observations of small mammal herbivory corroborate those documented in other studies (7). In 1989 and 1990, extensive impacts of suspected white-tailed jackrabbit herbivory were observed, also corresponding with drought conditions (8). Other occurrences of small mammal grazing by rabbits, chipmunks, and ground squirrels have been reported (7). The combination of intensifying periodic drought in western Colorado and grazing pressure from herbivores may substantially impact the long-term survival of *A. microcymbus* unless aggressive management interventions are undertaken.

Second, our observations of insect visitors point to the important role of solitary bees in *A. microcymbus* pollination. Therefore, maintaining diverse pollinator communities is important for its reproductive success (9). Heavy livestock grazing may reduce solitary bee nesting sites and materials, threaten existing nests, and reduce the availability of food sources (10). However, a moderate level of grazing intensity is an important management practice to support solitary bee populations (10,11) and should be implemented and maintained in *A. microcymbus* habitat.

Finally, the presence of an *A. microcymbus* seed bank in the soil may buffer populations against the demographic challenges of low reproductive years. However, continued low reproductive years will deplete these reserves. Furthermore, the seed bank itself is potentially threatened by climate change, as increased temperatures may impact seed dormancy, germination, and seedling survival (12). If warmer temperatures trigger seed germination in suboptimal conditions, then those individuals may not survive long enough to reproduce. Based on our findings, plant community structure supports the post-primary

dispersal seed ecology of this species. Rocks and/or vegetation act as seed catches during secondary dispersal, and vegetation specifically appears to support seedling germination and survival. Plant community degradation from overgrazing, recreation, and the establishment of invasive annual species each have the potential to threaten the plant community structure of *A. microcymbus* habitat.

Our findings can help agencies and land managers make informed conservation and management decisions that support the persistence of *A. microcymbus*. Moreover, a greater understanding of this plant's life history helps raise awareness and, hopefully, appreciation for its existence, its uniqueness, and its tenuous place in our world, which at this moment in history is losing floral diversity at unprecedented rates.

Funding for this research was provided by the US Fish and Wildlife Service and a Myrna Steinkamp Grant from CoNPS. We thank J. Neale and J. Reithel for assistance with experimental design and guidance during the course of the study; L. Conrad, T. Kelberg, E. Orr, E. McClure, and L. Hubbard for assistance with data collection; I. Breckheimer, Z. Treisman, and E. Hamann for contributions to data analysis; O. Wilmot, C. Bell, B. Irwin, and T. Griswold for identifying collected insects; and A. Seglias for determining the germination protocol used in this study.

*Bronwyn Taylor completed an MS in ecology from Western Colorado University in 2021 and is currently involved in seed collection projects (bronwynleandrataylor@gmail.com). Hannah Carroll is currently a postdoctoral fellow and the Center for Diverse Leadership in Science Early Career Fellow at UCLA (hcarroll@epss.ucla.edu). Her research interests include paleoecology and paleoclimatology, specifically how plant communities respond to changing climates over geologic time. Robin Bingham is a professor of biology and the former chair of the Department of Natural and Environmental Sciences at Western Colorado University (rbingham@western.edu). She is an evolutionary ecologist with specific interests in plant–animal interactions, evolutionary community ecology, the evolution of plant defense, and the role of phenotypic plasticity in adaptive evolution. ▶*

### Glossary

**Nurse Plant:** an established plant that improves the ability of new seedlings to get established.

**Pollinator exclusion:** flowers are covered to prevent pollinator access.

**Raceme:** an unbranched flowering stalk without pedicels.

**Taxon (taxa, plural):** any group in a biological classification into which related organisms are classified; includes species and subspecies.

**Tetrazolium tests:** a color-based method which results in viable seeds turning red.

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## ◀ “Pollinators...” continued from page 20

seeks to demonstrate the importance of considering not just the *quantity* but also the *quality* of pollination efficiency when investigating the relative importance of different pollinators for plant reproduction. While the focus of this study is to address this systemic research gap, there are also broad implications for conservation research and management decisions. Accurately determining the relative importance of pollinators is essential for the implementation of effective conservation strategies that focus on the long-term maintenance of plant populations and genetic diversity.

*The research described in this article was funded in part by a John W. Marr grant to Brendan Connolly, who is an MS student at the Chicago Botanic Garden and Northwestern University, where he is co-advised by Dr. Jeremie Fant and Dr. Paul CaraDonna. He is an alumnus of Denison University, and his research interests focus on understanding how plant-pollinator interactions affect the genetic diversity of plant populations. He plans to continue to explore similar questions in a PhD, with a more explicit focus on understanding how anthropogenic changes affect these dynamics. In his free time, Brendan enjoys hiking, birding, and reading fantasy books.*

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# Research and Reports

## A Native Plant Garden at Montessori Peaks Academy

By Steven Splitek

With the help of a Mission Grant from CoNPS, volunteers at Montessori Peaks Academy planted 25 trees and shrubs on the southern edge of the school's pollinator garden in May of 2022. This garden sits above the stream bank of Lilley Gulch in Littleton. The pollinator garden, with over 3,000 square feet of prairie plants, serves as an outdoor enrichment area and supports the school's active honeybee colony. The goal of this project was to create a natural border above the steep stream bank, which had been bare for a couple years after removal of invasive Russian olive trees.

The shrubs, purchased with the CoNPS Mission Grant, were a combination of riparian and drought-tolerant native species recommended by a consultant horticulturalist. This included *Prunus americana* (wild plum), *Rosa woodsii* (wild rose), and *Ribes aureum* (golden currant) on the side of the garden near existing irrigation. In a drier area away from irrigation, we used *Ericameria nauseosa* (rubber rabbitbrush) and *Fallugia paradoxa* (Apache plume). Most of the shrubs were purchased from the Douglas County Conservation District, with a handful purchased online from mail order suppliers. Many thanks to Heather Kelly at DCCD for assisting in getting some great-looking plants.

We had planned to do the installation during the last week of school, but a late May snowstorm delayed the event. A volunteer stored the plants at their home during the freeze and until the planting event could be rescheduled. By this time, school was out for summer break, so the volunteer effort was limited to a small crew of parents, teachers, and older children.

The crew planted and mulched the shrubs in one morning. Once installed, volunteers took turns irrigating about twice per week using recycled six-gallon brewery jugs with holes pinpricked in the bottom. The jugs were placed next to each shrub after being filled at the school and wheeled down a steep hill. Then it was back up the hill for the next jug, almost 500 yards round trip. The holes in the jug allowed a slow drip of water to release, providing a consistent source of water. Most of the shrubs did well through the summer heat and into fall. We have reserved a small portion of the grant money to purchase replacements in 2023 if needed.

In addition to water, control of invasive species in the gardens is a challenge. Field bindweed pops up near

the edge of the gardens where the shrubs are planted and is labor intensive to manage. On the slope along the stream bank, we removed hundreds of poison hemlock plants in the summer just prior to seed formation. In the fall, we stuck cuttings from the nearby willows in the slope to stabilize it and discourage encroachment by invasive species. We also transplanted some milkweed rhizomes dug up from other areas of the property where they had popped up in mowed corridors. On the opposite end of the garden, a couple of Russian olive tree stumps remain, which will require cut stump treatment and removal.

We are also watching out for deer browsing in the area. We know that deer travel through the Lilley Gulch corridor, but so far we haven't seen any damage to our young plants. We have applied for other grants that can cover materials like fencing.

*Steven Splitek is a Colorado Master Gardener apprentice and heads the MPA Outdoor Education committee, a dedicated group of parents, teachers, and staff who share their talents to ensure access to nature for every child in the school. In his free time, Steven propagates native plants and leads volunteers in maintaining and improving the school gardens. The hard work pays off knowing that children can feel a sense of place, appreciate growing plants, and experience the wonders of ecological diversity. When he is not in the garden, he spends his time exploring Colorado's natural areas, parks, rivers, lakes, and trails. 🌿*



Volunteers plant trees and shrubs at the Montessori Peaks Academy pollinator garden.  
© Lucyna Campo

# Research and Reports

## Colorado Science and Engineering Fair Report

By Ann Grant

The Colorado Native Plant Society awarded two student researchers at the Colorado Science and Engineering Fair (CSEF) held at Colorado State University April 13–15. CoNPS recognizes students with special awards for research on native plants or for work that can be applied to native plants.

In the Senior Division, the special award went to Carlos Ochoa-Marquez for his research, “The Effect of Heavy Metal Toxicity on *Solanum tuberosum*, *Cucurbita pepo*, *Medicago sativa*, and *Capsicum annuum* Plants Inoculated with Mycorrhizae.” He told an interesting backstory of how his uncle’s crops had been ruined by an “acid plume” of heavy metal contaminants, which motivated him to do the research on arbuscular mycorrhizae (AM).

Carlos measured growth in four sets of plants: two controls, untreated or treated only with AM, and two sets treated with heavy metals, one with no AM and one with AM. Specifically, he found that AM applied to the plants could partially counteract the effects of copper and zinc on plant growth in all but the *Cucurbita pepo* (squash) plants. The squash did not seem to be affected by heavy-metal application in the untreated control versus the plants treated with AM and heavy metals, or by heavy metals alone. Our CoNPS judges felt that his research could be applied to the restoration of native plant ecosystems.

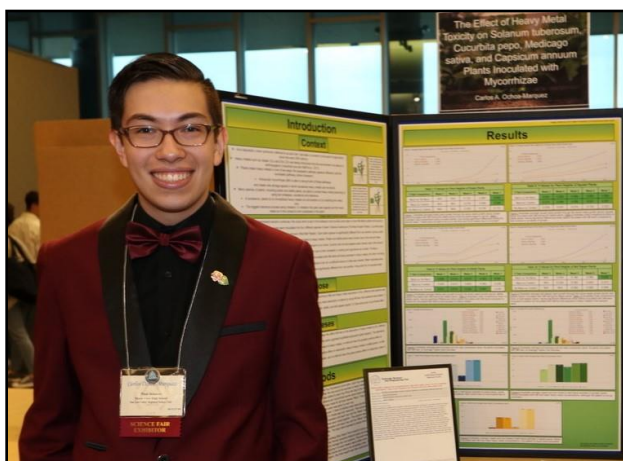
Carlos is a senior at Monte Vista Senior High School in Monte Vista in the San Luis Valley. His advisor was

Loreé Harvey, a science teacher at Monte Vista High School who was awarded Teacher of the Year in 2022.

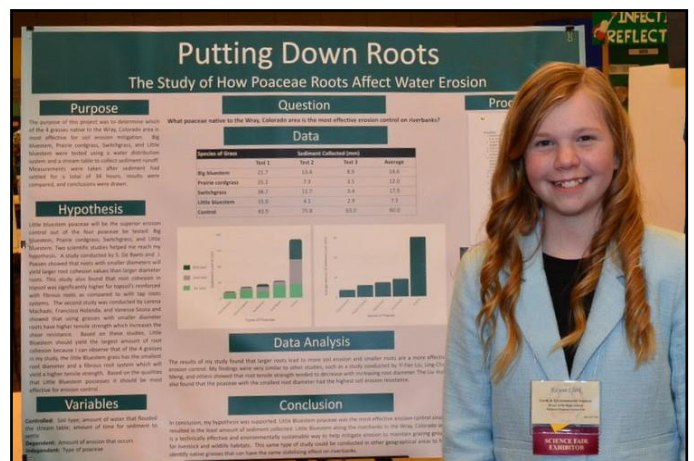
In the Junior Division, the special award went to Kaycee Clark for her research “Putting Down Roots: How Poaceae Roots Affect Water Erosion.” Prairie cordgrass, big bluestem, buffalo grass, and switchgrass were identified as native grasses along the Republican River. The grasses were grown in a greenhouse to establish their root systems and break dormancy. After six weeks of growth, they were placed in a specially constructed experimental streambed. The root balls were irrigated, the effluent collected, and the sediment measured. She concluded that the bluestem retained the most soil in the rootball.

Kaycee is a junior at Wray Junior/Senior High School in Wray. Her advisor was science teacher Eric Oestman.

Students were judged on the experiment’s design, their understanding of the scientific principles underlying their work, and the applicability of the results to research on native plants and their ecosystems. Awardees were each given a check at the awards ceremony, a free one-year membership to CoNPS, and a book on native plants in their region. A congratulatory letter from CoNPS was sent to each student and their advisors. The volunteer judges were James Gano (lead judge and coordinator), Ann Grant, Donna Hammerdorfer, Rob Pickett, Sonya Zaremba (all from the Northern Chapter), and Tim Berg (Denver-Metro). 🌀



Carlos Ochoa-Marquez, CSEF Senior Special Awardee from CoNPS. © CSEF



Kaycee Clark, CSEF Junior Special Awardee from CoNPS. © CSEF

## How to Write a Flora

By Jennifer Ackerfield

One of the main questions I get asked about the *Flora of Colorado*, now in its second edition, is, “How did you do it?” Writing a flora is now a simpler task than it once was thanks to herbaria technology advances, but there are still many steps in the process. Let's explore those steps to answer this central question of how one writes a flora.

The first thing you must do is generate a list of species for the area. This list is primarily generated from herbarium specimens or iNaturalist data, but it also sometimes uses reports from the literature or eyewitness accounts. For the first edition of the *Flora*, I used the *Checklist of Vascular Plants of the Southern Rocky Mountain Region*, by Neil Snow as reference for my checklist. However, the ability to search herbarium specimen data online has drastically increased since the first edition was published. Therefore, I was able to search herbarium records to find missing species that were inadvertently excluded from the first edition, or specimens that were unverifiable before. To keep track of all this information, I also keep a database of all known taxa, which includes native or introduced status, rare-plant rankings, flowering times, and elevation ranges.

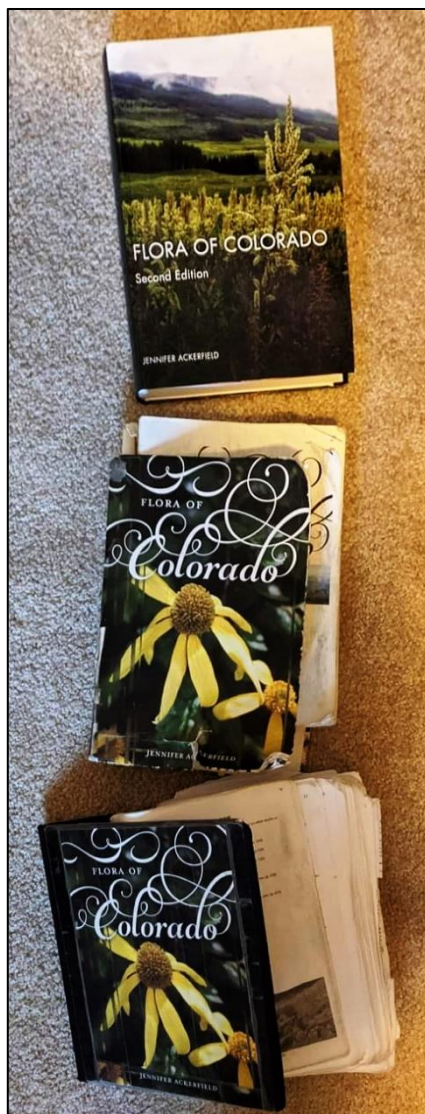
Generating a list of species in an area may seem like a relatively easy task, especially with all the online herbaria resources now available, but this is actually one of the most difficult parts of writing a flora. Why? Because there is no single recognized source for scientific names, and this is where controversy can set in. Depending on the author and the species concept they are using, different taxonomic analyses for the same group may exist. Therefore, it is important to do your own research on each plant group to evaluate each analysis method to see if it adheres to the species concept you are using. It is important to remember that each species name is just

a hypothesis, and that you are evaluating each hypothesis with as many lines of evidence as possible.

Once you have a species list, you can then begin to write dichotomous keys. For each group of plants that I write a key for, I first pull out an herbarium specimen for each species and lay them all out on a table. This way, I can look at this group and start to see large-scale morphological patterns. When writing a key, I begin with more visible features first and then narrow down to more microscopic ones. Sometimes, I need to consult with type or reference specimens for each species to see exactly which features define it morphologically. Other times, I consult other treatments, such as the *Flora of North America* series, to see what others used to discern among different species. Once finished, I then test each key using herbarium specimens to determine if changes need to be made.

Along with the dichotomous keys, *Flora of Colorado* includes short species descriptions. These descriptions contain measurements and descriptors often taken from the most current literature, although sometimes the measurements are taken directly from herbarium specimens. Unlike many other floras, the *Flora of Colorado* has dot-distribution maps for almost every species in the state, which are much more informative than the previous county-level maps. However, these dot-distribution maps are also not without their own controversy! Each dot represents a specimen collection. However, some of these dots are based on herbarium specimens that are misidentified or specimens that are incorrectly plotted. To limit these erroneous inclusions as much as

possible, I carefully examined each distribution map for outliers. I then verified each outlier, removing dots if they were incorrect. I also made sure that the dots in question corresponded to the county from which ►



*Flora of Colorado* over time. Bottom-to-top: first edition, first printing; first edition, second printing; new copy of second edition. © Pam Smith

## Glossary

**Dichotomous key:** a tool used to identify an organism to species level; consists of a series of paired statements or questions.

**Flora (book):** a compiled list of plant species for a defined geographical area; usually includes keys and descriptions to aid in species identification.

**Herbarium:** a collection of dried and preserved plants

**Species concept:** a theoretical methodology used to distinguish one species from another.

**Taxon (taxa, plural):** any group in a biological classification into which related organisms are classified; includes species and subspecies.

**Taxonomic analysis:** the method used to define species classification.

**Type specimen:** the original herbarium specimen used to define the species.

◀ they were collected. In this way, I was able to clean up the distribution maps so that any potential misidentifications left fell within the range of distribution for that species and therefore did not drastically alter the map if their inclusion remained.

Also, unlike many other floras, the *Flora of Colorado* utilizes photographs to aid in identification. The majority of these photos were taken by me over the last 20-some years. In the second edition, I was also

able to fill in some photo gaps through iNaturalist observations and by securing permission from other photographers. All told, photos accompany approximately one-third of the species in the state.

In short, writing a flora is no easy task! It takes years to compile, test, and edit; and just when you think you are finished, a new round of nomenclatural changes appears. However, it's important to remember that these taxonomic changes will just keep coming, and that any flora is simply a snapshot in nomenclatural time.

*Jennifer Ackerfield is the Head Curator of Natural History Collections and Associate Director of Biodiversity Research at Denver Botanic Gardens. She coordinates the growth and improvement of the natural history collections and supports biodiversity research efforts. Jennifer has been studying the flora of Colorado for nearly 30 years. During this time, she has traveled extensively across Colorado documenting its rich floristic diversity. Prior to her current role, she was the Assistant Curator of the Charles Maurer Herbarium at Colorado State University. At Colorado State, Jennifer also taught Plant Identification for nearly 20 years. She is passionate about educating students and the public on the wonderful world of botany. Jennifer also is an expert on native thistles (Cirsium), and has even named three new species of thistles. Jennifer has worked with several organizations and agencies across the state. She regularly participates in bioblitzes, and leads field trips, workshops, and community participatory science campaigns.* 🌀

## In Memorium: Bob Trout

### By Ann Grant

Robert (Bob) Allen Trout, of Loveland and Berthoud, passed away on March 16, 2023, after a long illness.

Bob was born January 25, 1952 in Oak Park Illinois to Marion and Robert Trout. He had a BA in economics, a second BS in medical technology, and an MS in health care administration. He spent 35 as a clinical laboratory scientist and microbiologist.

Bob was passionate about service and the environment, working his whole life to serve the community and preserve natural resources. He did volunteer work for many years with the US Fish and Wildlife, Rocky Mountain National Park, and other organizations.

After his retirement, Bob worked as a volunteer at Walt Clark Middle School and started a community volunteer group called Loveland Initiative for Monarch Butterflies. He organized volunteer efforts to build a pollinator garden at Walt Clark, and guided the planting of over 5,000 milkweed seedlings in the community to support monarch butterflies. When asked what he was most proud of in his life, besides his family, he named the garden at Walt Clark.

Bob devoted countless hours over many years to mentoring youth and fostering their interest in botany, plant-insect relationships, and habitat restoration. When CoNPS partnered with the City of Loveland and community volunteers in 2019 to install two native plant demonstration gardens at River's Edge Natural Area, Bob ensured students from nearby Walt Clark Middle School were involved. First, as a longtime volunteer with the school's greenhouse program, months before the gardens were installed, he worked with students to propagate three milkweed species and locally sourced rayless greenthread expressly for the project. Then, on each of the planting days, Bob appeared with trays of seedlings and taught student volunteers how to plant them. His botanical knowledge and dedication to improving habitat for monarch butterflies and other invertebrates clearly inspired many middle-schoolers to see a role for themselves in land stewardship and to follow his model of service to the community and the environment.

<https://viegutfuneralhome.com/tribute/details/313877/Robert-Trout/obituary.html> 🌀

## The Taming of a Wildflower

By Jim Borland

According to *Merriam-Webster*, a wildflower is “the flower of a wild or uncultivated plant or the plant bearing it.” Stated another way, “If the plant is in your garden, it is under cultivation and therefore no longer wild.” Why?

It is no longer wild because it has been subjected to a wide variety and numerous human-influenced artificial selections or pressures, each of which decreases the size of the original gene pool, thus diminishing the “wildness” of the wildflower.

The gene-pool-diminishing pressures involved with getting seed of a commonly available “wildflower” into a seed packet begin in the original wild population, where seed from only a small sample of the whole population is selected for color, height, seed ripeness, plant stature, and other traits subjectively valued by the collector. The gene pool is diminished further during the harvesting and cleaning phases, where larger or smaller than “normal” seed is often discarded, and other viable seed unable to handle the harvesting and cleaning processes is discarded as well.

Storage methods and procedures diminish the gene pool even further, eliminating those seeds and genes unable to remain viable under the temperature, humidity, and time conditions imposed by humans.

Since enormous quantities of seed are necessary to retail vendors, seed production begins the next year with sowing and growing; for annuals, production is repeated several more years until enough seed is harvested for large-scale packaging.

Sowing procedures further reduce the gene pool by eliminating those seeds and their genes that do not conform well to the sowing method or mechanism, or

are planted at depths too deep or too shallow. Further reductions occur in the growing phase, where genes are lost due to their unsuitability to the many variable conditions of the foreign soil, irrigation or precipitation patterns, and other climatic conditions. Roguing (the process of removing undesirable plants) the seed production fields for “off types” in color, height, vigor, and numerous other factors ensures that you are not receiving a very wild wildflower in the seed packet.



The Montessori Peaks Academy pollinator garden.  
© Lucyna Campo

The pressures on the original gene pool continue. You, the gardener, apply your own unique set of pressures when you sow and cultivate the resulting plants in your garden, far, far removed from the natural selective forces that designed Mother Nature's original garden.

Wildflowers grown from cuttings are likewise subjected to their own wild gene-pool-diminishing series of selective pressures. Sometimes a plant is subjected to both seed and cutting forms of pressure before it reaches your garden.

Are these reductions in the gene pool good or bad? It

depends. The right kinds of selection can ultimately result in a plant supremely adapted to a wide variety of growing conditions and well-suited to gardens throughout a wide region of the country. Mother Nature, however, would not easily confuse your garden plants with those of her own.

When asked what she thought was a wildflower, a friend of mine, L. Livingston, answered, “It's a plant native to wherever you are.” Are yours?

*Jim Borland has been fooling around with native plants for more than 40 years in private, commercial and public venues. His home garden contains thousands of native plants, most grown from seed at home and not supplementally watered for 20 years. Jim has written hundreds of articles, given talks too numerous to count and continues to grow and plant the two or three native plants not yet in his garden.* ☞

# Plant Profile

## Dandelions: An Appreciation of the “Tooth of the Lion”

By Dick and Loraine Yeatts

The common dandelion, *Taraxacum officinale*, is a Eurasian native now also found in Australia, North and South America, and southern Africa. The spread of *T. officinale* was aided by humans who valued its many useful properties. The dandelion assured its place by being one of the most adaptive plants on Earth, from sea level to timberline. Incidentally, the name “dandelion” is a corruption of the French *dent-de-lion*, tooth of the lion, for the *dentate* character of its leaves.



Common dandelion (*Taraxacum officinale*).  
© Loraine Yeatts

Historically, the dandelion, and a couple of its taxonomic relatives, has been used for food and medicine throughout Europe and China for more than a thousand years. Medicinally, it is known to be a diuretic, but colloquially it’s been used to treat everything from “warts to the plague.” Its leaves, of course, provide a nutritionally rich salad green; its roots, when roasted, make a coffee substitute; and its flowers can be made into dandelion wine. The flowers can also be used to make a yellow dye, and the sticky sap in dandelion leaves and stems contains latex, used in making rubber.

The spherical flower heads (blowballs) of mature dandelions hold numerous seeds, each a single achene suspended by a feathery hang glider-like pappus. The seeds can be carried a considerable distance by the wind because of a special air circulation pattern (vortex) caused by the pappus. Aeronautical engineers use this phenomenon in the design of lightweight aircraft.

Before the nineteenth century, dandelions were cultivated in preference to grass because of their beauty as a spring flower and their value as a ground cover. For present-day gardeners, *T. officinale* has many benefits in addition to those mentioned above: attracting pollinators; a taproot that brings up nutrients from the soil; and flowers that produce ethylene gas, which helps fruits ripen. Considered a short-lived perennial, a dandelion plant might last several years and produce a tap root several feet in length—talk about a weeding problem!

Many members of the *Taraxacum* genus, especially those of European descent, are triploid, and thus often do not reproduce sexually. Instead, they can reproduce by apomixis and parthenogenesis, two types of asexual reproduction that are subtly different, although both result in clones of the mother plant. Apomixis replaces the seed of the plant with a plantlet or the flower with a bulbil. Parthenogenesis produces fertile seeds directly from the unfertilized ovule. Both means of asexual reproduction have been identified in the same dandelion population. The genetics involved is beyond the scope of this article and the comprehension of those of us who are challenged by the intricacies of genetic research.

According to F. H. Wiggers, author of the *Taraxacum* treatment in *Intermountain Flora: Vascular Plants of the Intermountain West, U.S.A.*, and *Flora of North America (FNA; Vol. 19, 20 and 21; Page 8, 215, 239, 240, 241, 242)*, “*Taraxacum* taxonomy and ►



Horned dandelion (*Taraxacum ceratophorum*).  
© Loraine Yeatts

◀ nomenclature is in a state of utter confusion” due to apomixis, polyploidy, and hybridization.

How is one to distinguish among Colorado’s native, introduced, and the similar false dandelions? Ideally, the characteristics used to determine species should not be variable, but many plants, including dandelions, are nonconformists, to the consternation of those who write keys. Morphology changes as plants mature, which may be obvious to the observer but hard to define in a key. Jennifer Ackerfield’s recently published second edition of *Flora of Colorado* recognizes native dandelions *T. ceratophorum* (horned dandelion), *T. eriophorum* (woolbearing dandelion), and *T. scopulorum* (alpine dandelion), and non-natives *T. officinale* (common dandelion) and *T. laevigatum* (rock dandelion).

The *FNA* treatment recognizes natives *T. ceratophorum* and *T. scopulorum*, but considers *T. eriophorum* a synonym of *T. ceratophorum*. In *FNA*, *T. laevigatum* is lumped with *T. erythrospermum*. *Colorado Flora* (Weber and Wittmann 2012) includes the same native species as Ackerfield (2022) but makes *T. ceratophorum* a synonym of *T. ovinum* and agrees with *FNA* that *T. laevigatum* is not distinct. Confusing?

In Colorado, all native dandelions and some *Agoseris* species of false dandelions occur near or above timberline. The cypsela (achenes, seeds) of true dandelions are 4–5 angled in cross-section with prominent longitudinal ribs on the angles and minor ribs on the intervening surfaces. Spiky bumps occur near the apex of the seed body on 4-10 longitudinal ribs. False dandelion seeds have about 10 prominent, smooth ribs. If the plants are not fruiting, flower color



Alpine dandelion (*Taraxacum scopulorum*).  
© Loraine Yeatts

## Dandelion By Dick Yeatts

Willy B Windy, a zephyr by trade,  
Danced with a flower, a yellow haired maid.  
She swayed to and fro in his airy embrace  
And twisted and twirled as he swirled ‘round  
the place.

To yellow haired Dande, no hustler he’d be,  
For parthenogenetic was she.  
And pollination to her is no gift  
“Why should I rely on genetic drift.”

But when her crown turns a silvery-gray  
And her brood is set to make their own way,  
Willy’s waft fulfils the progeny’s need  
To find new ground to plant their own seed.



Common dandelion (*Taraxacum officinale*)  
seedhead. © Loraine Yeatts

is not definitive; true dandelions are always yellow, while false dandies can be yellow, orange, or pinkish.

The chart on the next page shows morphological characteristics used in various floras to identify and separate the natives from the non-natives.

Subjective terms cause confusion, but, taken together, they may lead to the identity of a species as currently accepted or possibly a hybrid. There is still much to learn about the secret life of dandelions. Reigning dandelions don’t care what we call them, so take your pick. But please don’t pick them.

Loraine Yeatts has been a research assistant and volunteer in the Denver Botanic Gardens’ Kathryn Kalmbach Herbarium of Vascular Plants since 1966, when the original herbarium was stored in the Gardens’ Waring House library. She is thankful to have been part of the herbarium’s phenomenal growth and recognition, and to have learned from, and worked with, all the dedicated staff and volunteers throughout the years. Her most memorable ►

◀ experiences occurred while conducting a comprehensive plant survey of Rocky Mountain National Park from 1986 to 1994. Plants that especially fascinate her reside in alpine and desert environments where she admires them for their beauty, their resilience to nature's extremes, and for the taxonomical challenges that provide constant entertainment. She is currently helping develop the herbarium's reference collection by contributing specimens from her personal herbarium and verifying the identity of herbarium specimens, as needed.

Dick Yeatts, PhD, is professor emeritus of physics at the Colorado School of Mines, where he researched earthquake mechanics. Since retiring, he has been interested in the mathematics of plant morphology and has published papers and given talks on the subject, including presentations to the School of Botanical Art & Illustration at Denver Botanic Gardens. He was sherpa, digger, and root

cleaner on many of Loraine's plant-collecting expeditions. Together, they were stewards for the Gateway Natural Area, Fort Collins, for 14 years, and they continue to enjoy visiting Gateway as emeritus stewards.

### References

Ackerfield J. (2022) *Flora of Colorado*. Second edition. BRIT Press.

Weber WA and Wittmann RC. (2012) *Colorado Flora: Eastern Slope*

*A Field Guide to the Vascular Plants*. Fourth Edition. University Press of Colorado.

*Flora of North America*.

[http://floranorthamerica.org/Main\\_Page](http://floranorthamerica.org/Main_Page) 🌀

### **Taraxacum morphological characteristics useful for distinguishing species.**

Characteristic	<i>T. officinale</i>	<i>T. laevigatum</i>	<i>T. ceratophorum</i>	<i>T. eriophorum</i>	<i>T. scopulorum</i>
outer phyllaries (bracts) recurved to reflexed	yes	sometimes	no	no	no
inner phyllaries corniculate (hooded at tip)	no	commonly	usually	rarely	rarely
phyllaries	green	green	green	green	blackish green
mature achenes	brown	reddish purple	brown	brown	blackish
leaf lobing to midrib	> halfway	> halfway	± halfway	< halfway	< halfway
preferred habitat	disturbed areas, lawns, meadows	disturbed areas, lawns, meadows	alpine tundra, subalpine meadows	alpine slopes	alpine fell-fields and rock ledges and crevices



◀ Hidden Mesa..." continued from page 7

signs or to use the audio-guided tour. When volunteers are present, they may give impromptu tours. Formal in-season tours can also be arranged by calling the Douglas County Extension office (720-733-6930) or by emailing Andy Hough (ahough@douglas.co.us). Or tour on your own by visiting the gardens at 3217 County Rd. 83, Franktown.

Lenore Mitchell, long-time member of CoNPS, is an avid amateur who has taught Native Plant Master courses through CSU JeffCo for over 17 years and has taught for Osher Lifelong Learning Institute (OLLI) at Denver University. She says teaching is a great way to keep learning. Writing is a long-time interest, and she recently published a mystery, *Dying to Ride*. 🌀



# Restoration Roundup

## And Now for Some Good News: River Bluffs Open Space Restoration

By Amy Gilbo

Larimer County's Natural Resources department was established in 1954 and manages more than 30,000 acres throughout the county. River Bluffs Open Space (RBOS) is located along the Cache la Poudre River, approximately two miles west of Windsor and four miles southeast of Ft. Collins. This small but important open space allows access to both the Poudre River and the Poudre River Trail. In the 1950s, the Colorado Department of Transportation channelized this section of the river with large earthen berms. This was done to protect the integrity of State Highway 392, the southern boundary of what is now RBOS. The berm construction disconnected the floodplain from the river, destroyed any wetlands present and negatively impacted the natural function and processes of the river.

In 2013, Colorado's Front Range experienced devastating flooding, including along the Poudre River. The floodwaters overtopped the berms at RBOS, causing damage throughout the open space. A longtime goal of the RBOS Resource Management and Implementation Plan has been to restore wetlands and riparian areas, thus creating more resiliency during any future flooding as well as providing healthy habitat for fish and wildlife. After the floods, disaster-recovery funding became available to help repair damage and implement these management-plan goals. Larimer County applied for and received more than \$1.3 million from the Colorado Department of Local Affairs, \$154,000 from Colorado Parks and Wildlife, and \$100,000 from Great Outdoors Colorado. The total cost of the project was estimated at \$1.6 million.

A conceptual design was first created to determine what restoration activities would work best to reconnect the floodplain and create a healthier river corridor. After a design was selected, construction and groundwork began in January 2019. Restoration activities included removing and regrading berms, creating overflow channels to reconnect the river to the floodplain, installing beaver dam analogs, creating riffles for fish habitat, restoring wetlands, and establishing native plant species.

To establish native plants, a vegetation plan was based on the four hydrologic zones of the approximately 16-acre restoration site: water's edge,

lower riparian, upper riparian, and upland. First, we removed the top 16 inches of soil. This was necessary since smooth brome (*Bromus inermis*) was the dominant species as this site was used for agriculture in the past. We then decompacted the soil so that water and nutrients could effectively reach plant roots. Next, we tested the soil to determine whether any fertilizers or amendments were needed.

We developed two native seed mixes for the hydrologic zones. The seed mix for the water's edge and lower riparian zones included species such as inland saltgrass (*Distichlis spicata*), arctic rush ►



Before and after photos of River Bluffs Open Space. The top photo was obtained prior to restoration work. The bottom photo was taken along the Cache La Poudre River one year after restoration. © Amy Gilbo



Blanketflower (*Gaillardia pulchella*) and other perennials established at RBOS. © Amy Gilboy

◀ (*Juncus arcticus* var. *balticus*), prairie cordgrass (*Spartina pectinata*), plains coreopsis (*Coreopsis tinctoria*), and Nuttall's sunflower (*Helianthus nuttallii*). The upper riparian and upland mix contained buffalograss (*Buchloe dactyloides*), blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), prairie coneflower (*Ratibida columnifera*), annual sunflower (*Helianthus annuus*), and Rocky Mountain bee plant (*Cleomella serrulata*).

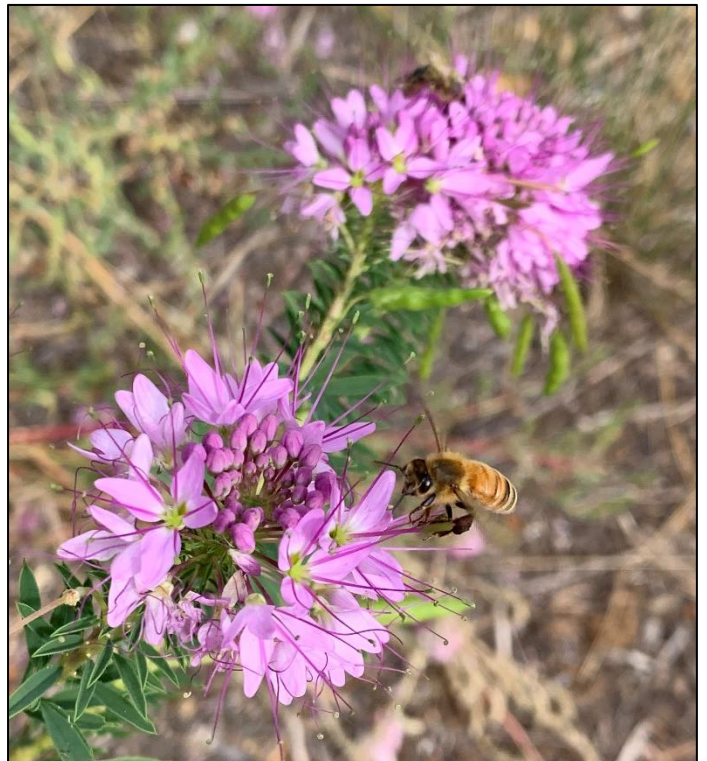
In addition to seeding, we planted hundreds of container-grown plants, including red osier dogwood (*Cornus sericea*), pale bulrush (*Scirpus pallidus*), false indigo bush (*Amorpha fruticosa*), narrowleaf cottonwood (*Populus angustifolia*), and eastern cottonwood (*Populus deltoides*). Cuttings and container-grown peachleaf willow (*Salix amygdaloides*) and narrowleaf willow (*Salix exigua*) were specifically selected for various restoration features in the landscape, such as beaver dam analogs and other woody structures. Initial restoration activities were completed by the fall of 2019.

Monitoring is being performed at the restoration site in several capacities. Dr. Sharon Bywater-Reyes, assistant professor of environmental geoscience at the University of Northern Colorado, is conducting hydrologic monitoring, while Colorado Parks and Wildlife does annual fish surveys. County staff conduct vegetation monitoring once a year, which helps drive adaptive management decisions at the site. As at many restoration sites, noxious weeds are a continuing problem. In the uplands, several management techniques, including herbicide treatment and mowing, have been used to control kochia (*Bassia scoparia*), the most prolific post-restoration noxious weed. County staff will continue monitoring and managing kochia until native species are dominant. The good news is that monitoring has

determined that the riparian, lower floodplain, and channel areas have been significantly improved since restoration took place. Besides the successful seeding and stock plant growth in the water's edge and lower riparian zones, hundreds to thousands of willow and cottonwood stems have naturally recruited at the site—a good sign for further passive restoration.

Within a few short years of implementation of the project at RBOS, several goals of the management plan are coming to fruition with the creation of wetlands and improvement of wildlife habitat. This is good not only for the open space, but also for the surrounding areas and the overall health of the Cache la Poudre River.

*Amy Gilboy has been the Restoration and Stewardship Specialist for Larimer County Department of Natural Resources since September 2018. An integral part of her job includes management of restoration sites on open spaces, especially post-monitoring, and subsequent adaptive management. Prior to working for Larimer County, Ms. Gilboy worked in both the public and private sectors for over twenty years, including local and federal government, largely in the southeast and western United States. She was also a Peace Corps Volunteer in the Philippines (1999-2001) working on coastal resource management projects. She received an MS in Resource Ecology and Management from the University of Michigan and a BS in Biological Science from Florida State University. Ms. Gilboy's contact info is [agilboy@larimer.org](mailto:agilboy@larimer.org) or 970-619-4553. 🐝*



Rocky Mountain beeplant (*Cleomella serrulata*) and honeybee at the RBOS. © Amy Gilboy

# Tips from the Pros

## Strategies for Sourcing Native Plants At Your Local Garden Center

By Alex Smith

Navigating one's local garden centers can be overwhelming: finding parking, getting the attention of busy staff, and deciphering plant names. This frustration is only exacerbated in the race to acquire traditionally hard-to-find Colorado native plants. Having spent the last five years in the horticulture industry, I have discovered a few shortcuts to procuring Colorado native plants from Colorado retailers.

The first is picking the right garden center. Not all garden centers have the focus or the capacity to host a robust Colorado native plant program. Often a trip to their website can be illuminating enough. Do they mention anything about Colorado native plants? Do they host classes or events on waterwise or ecology-minded gardening? If a trip to the physical space is warranted, it is highly recommended to go in the off-season (September–March). This will ensure that you get the full attention of the staff. In addition, most garden centers holding on to year-round staff generally prioritize individuals with greater plant knowledge. Now that we have found the right garden centers in our area, let's make sure we get our foot in the door when they're open.

The second tip: Ideally, you'd want to begin your search for native plants in September for the following year. The majority of plant orders for the spring are made by nurseries in the late summer and fall of the year prior. Calling your favorite garden center and requesting the natives of your choice will put the plants in the minds of the individuals placing the early orders at a time when they are actively placing those orders.

From personal experience and for a plurality of reasons, Colorado native plants are difficult to supply and tend to sell out quickly. In many cases, when a nursery sells out for the season, there is no resupply

available. By putting yourself on a plant-request list in the fall and checking in regularly the following spring you can guarantee you are first in line when your favorite natives arrive.

In addition, actually going to the store, voicing your preferences, and being persistent in those preferences is the best way to influence the market at large. Unless the ownership has a specific ecological focus for their business, the odds of them selling plants that no one is asking for are low. In essence, there is no value in us waiting around for profit-based entities to become beacons of ecological enlightenment. Many of those that are currently heading in that direction have done so after customers, clients, and staff have spoken up over the span of many years.

A third and final trick for procuring your favorite Colorado native plants from retail spaces, especially in spring: a willingness to travel. There are a few big names in the retail and wholesale horticulture industry in the

state, and they can be worth the drive. In fact, many of the Colorado natives sold at local garden centers are procured from wholesale nurseries in the state that also have retail branches. Let's say your local garden center has a limited supply of natives and does not seem interested in expanding their native plant program. If asked, they might be willing to let you know where they obtained the few natives that they are carrying. Despite your location within the state, it's as easy as a road trip across one of the most beautiful regions in the world. Some of these locations, such as Harlequin Gardens in Boulder, may also offer a great spot to find pesticide- and herbicide-free plants.

*Alex Smith graduated from Purdue University with a BS degree and has four years of management experience in the field of horticulture. He recently joined the CoNPS board of directors. He is passionate about the ways in which plants, animals, and humans interact and coexist.* ☯



Colorado native plants for sale at a local nursery. © Alex Smith

# News, Events, and Announcements

Please check the **Calendar of Events** online at <https://conps.org/event-calendar-2/#!calendar> for up-to-date information on webinars, chapter meetings, garden tours, field trips, and other events.

CoNPS may offer some chapter meetings, workshops, and lectures as webinars or other online meetings. Others might be postponed or canceled. Information will be posted online and will be promoted via the CoNPS E-News.

## CoNPS-Sponsored Events

### CoNPS Board Meetings

**June 25, August 27, 4:00 - 5:00 PM, virtual**  
Hosted by CoNPS Board of Directors

All CoNPS members are welcome to attend board meetings.

### CoNPS Bookstore and Open House

**First and third Thursdays, 9:00 - 11:00 AM**  
Hosted by CoNPS Staff

Please help us pack book orders, browse our library, and enjoy great company. Located at Sustain-a-Center, 704 E. Boulder St., Colorado Springs.

### CoNPS Native Plant Sale

*We need volunteers to help at the pickup sites! Please see the CoNPS calendar to register to volunteer.*

#### Boulder Native Plant Pickup

June 3, 9:00 AM - 1:00 PM  
Harlequin's Gardens, 4795 North 26th St., Boulder

#### Colorado Springs Native Plant Pickup

June 4, 9:00 AM - 1:00 PM  
Old North End, private residence, will email address

#### Denver Native Plant Pickup

June 10, 9:00 AM - 1:00 PM  
Chatfield Farms, 8500 W Deer Creek Canyon Rd, Littleton

#### Fort Collins Native Plant Pickup

June 11, 9:00 AM - 1:00 PM  
Nix Native Plant Garden, 1745 Hoffman Mill Rd, Fort Collins

## CoNPS Committee Updates

**Each committee meets monthly in order to coordinate efforts. All are welcome to attend; please register through the CoNPS calendar to receive a link to the virtual meetings.**

### Conservation Committee

**Meets as necessary**

So far this year, the CoNPS Conservation Committee submitted a public comment letter, written by Brad Klafehn and signed by Maggie Gaddis, and signed on to five comment letters written by other agencies.

**April 7:** Comments to US Army Corps of Engineers (USACE) on the proposal in Summit County to raise the spillway by five feet on the Clinton Gulch Reservoir, which would inundate three acres of wetlands, including one acre of fen. The proposal would allow Summit County snowmaking to weather four years of drought, rather than three. Since the applicant submitted only 'conceptual' plans to mitigate loss of the fen, CoNPS asked USACE to analyze the real-world ability to restore or recreate fens, citing a recent peer-reviewed study in the journal *Biodiversity and Conservation* which said: "Restoration or de novo construction of peat-forming fens cannot compensate for a loss of ancient fens." Fellow non-profit Save the Colorado also obtained a 1998 memo from US Fish and Wildlife which said, with regard to fens in Region 6, "because of the high degree of uncertainty associated with attempts to mitigate impacts, the success of proposed mitigation should be demonstrated prior to project initiation..." A decision by USACE is pending.

Below are the public comment letters we signed:

**February 6:** Letter to CO State Senators, initiated by Environment, Colorado, to show our support for a bill to **save the bees from toxic pesticides** in Colorado. "To protect bees in urban areas, we should amend the Pesticide Applicators' Act during its sunset review to limit the sales of neonics to consumers.... A reauthorized Pesticide Applicator's Act, with these new restrictions, would bring Colorado one step closer to protecting our pollinators from these toxic pesticides."

The sunset review did not add the proposed language. However, SB23-266, which requires the Ag Commission to designate neonicotinoid pesticides as 'limited-use' pesticides, has passed both houses, and **is on its way to the governor.**

**March 23:** Letter to the US Global Change Research Program, initiated by Defenders of Wildlife, Sierra Club, Natural Resources Defense Council, and the Endangered Species Coalition, 'in support of the Biden Administration's National Nature Assessment that provides policymakers with a stronger foundation for **taking action to stem the biodiversity crisis.**' On Earth Day, President Biden issued Executive Order 14072 ►

◀ directing the federal government, among other things, to carry out the National Nature Assessment.

**April 4:** Letter to Congress urging an **increase in funding for imperiled species conservation**. Letter initiated by Defenders of Wildlife. 'USFS and BLM still receive only a tiny fraction of funding needed to meet their obligations under the Endangered Species Act (ESA). These two agencies manage close to 20% of the country's land base, providing habitat for hundreds of animals and plants listed under the ESA as well as thousands of other at-risk species. More funding is badly needed to combat the extinction crisis with the scale and urgency that it demands.'

**April 23:** Ancillary Use/Overtaking **Rosemont Ruling Bill** Letter to Senators, 'requesting their opposition to any legislation that may be introduced that has the same goals as Section 20307 from HR1. This section's language will allow speculative miners, including foreign mining companies, to potentially lock up our public lands under the pretense of mining without proven claims, and would prevent or slow deployment of renewable energy production and transmission across the country. Under this bill, a claimant would no longer need to actually prove they discovered valuable minerals. Any person could 'claim' mining rights on unwithdrawn public lands merely by grounding a stake, paying a fee, and filing paperwork.' Letter initiated by Earth Justice, Washington, DC.

**April 24:** Support Letter for HR 195, Resolution reintroduced by Representative Neguse, calling for the **creation of a National Biodiversity Strategy** (NBS). Letter initiated by Defenders of Wildlife. 'With nearly one million species at risk of extinction in the coming decades, an NBS provides a critical blueprint for the US to address and stem the crisis facing nature and its benefits to humankind. It would also promote a more coordinated response and provide governments, corporations and non-profits with a roadmap for actions needed to address the crisis' major drivers.'

## Education and Outreach Committee

**Third Wednesdays, 6:30 - 8:00 PM, virtual**  
**Led by Kathy Okon**

The CoNPS Education Outreach Committee serves to educate the general public about native plants, and to inspire and empower adults and youth to take positive actions to take care of the earth. The Committee has three focus areas: Adult Programs, School/Youth Programs, and Community Outreach Activities. Committee members are currently completing a four-part training and will be presenting educational programs, as well as staffing booths at community events and completing a variety of other community activities. If you would like to help with community

events, etc., please contact Kathy at [conpsworkshops@outlook.com](mailto:conpsworkshops@outlook.com)

## Field Studies Committee

**Meets on second Wednesdays of the month**  
**12:00 - 1:00 PM, virtual**  
**Led by Gwen Kittel**

The Field Studies Committee is working to revive the Adopt-a-Rare Plant program in partnership with Colorado Natural Heritage Program. We are also working to on the Todd Gulch Fen Phenology project.

## Grants and Scholarships Committees

**Meets on the third Thursdays of the month**  
**8:00 - 9:00 AM, virtual**  
**Led by Anne Beard**

The Grants and Scholarships Committees are pleased to announce the following awards:

### Myrna P. Steinkamp grants

**Laura Meadows**, PhD student at University of Northern Colorado, "Defining the Future of *Oenothera acutissima* with Taxonomy and Population Genetics."

**Logan Wagner**, Citizen Scientist, "The Borderlands Project: Documenting Plant Species Along Colorado's Western Border."

### John W. Marr grants

**Miles Moore**, Senior Undergraduate at CU-Boulder, "Ecological and Environmental Stress Effects on the Resource Acquisition Strategies of a Native Facultative Root Hemiparasite, *Castilleja occidentalis*."

**Adele Preusser**, MS student at CU-Boulder, "Floristic Inventory of the Vascular Flora of the Powderhorn and Western La Garita Wilderness Areas and Adjacent Lands in the San Juan Mountains of Southwestern Colorado."

**Seth Raynor**, MS student at CU-Boulder, "Lichens of the Colorado Front Range, Towards a Complete State Inventory."

**Alden Sears**, PhD student at North Carolina State University, "How Competition for Pollinators and Apparent Competition via Seed Predators Structure the Diversity and Assembly of Plant Communities."

**Alaina Smith**, MS student at University of Denver, "Effects of Wildfire Burn Severity on Pollinators."

### Mission grants

**Aleshia Rummel**, Gunnison Conservation District in support of "Advanced Workshop: Water Wise Pollinator Gardening" to be held in Gunnison on June 9, 2023. ►

## ◀ Horticulture Committee

**Meets on third Mondays of the month**

**12:00 - 1:00 PM, virtual**

**Led by Ann Grant**

The Horticulture Committee has been assisting in the CoNPS Plant Sale. We are also working to plan the CoNPS Garden Tours. The Northern Chapter is growing natives with five other conservation partners at OneCanopy greenhouses in Loveland. The plants will be distributed at the second Annual Xeriscape Garden Party on June 17. There will also be a Pollinator and Native Plant Swap and Giveaway in Denver on June 24 with three other organizations.

Members who have a CoNPS Certified Native Plant Garden are being asked to participate in the Annual Native Garden Tours. These tours are conducted in the various chapters and are a good way for members and the general public to see what others are doing to create natural spaces for pollinators, birds, and other wildlife. Won't you consider volunteering your garden? We are not looking for *House Beautiful* or *Better Home & Gardens* projects. You have a compost or twig pile? Terrific! Your garden is not 100% weed free or 100% native plants? Whose is? You have some bare ground or a patch you haven't gotten to yet? Join the club! We want to see gardens-in-progress as well as mature landscapes. Anyone can volunteer their garden for the tour. To volunteer your garden, fill out this [form](#).

The Certified Native Garden Program is undergoing transition as we locate a new sign manufacturer. We are also revising the application to reflect developing trends in native plant gardening, give more definitive award criteria, and make the form fillable online so forms and photos can be sent online. But don't let that stop you! You can use the existing form as guidance for the basics of what we are looking for. Take plenty of photos of your garden through the season, and plan on submitting an application later this year. Access the current form here: <https://conps.org/home-2/resources/certified-native-plant-garden/>

## Volunteer Opportunities

### One Canopy Greenhouse

**May 18 - 20**

One Canopy Greenhouses, an important partner of ours, is asking for volunteers to help move flats of tree seedlings. Since March, CoNPS members and other conservation organizations have been growing native plants for the Xeriscape Party and native plant giveaway on June 17. One Canopy donated the heated, automatically watering growing space to us.

### Sunset Vista Natural Area Native Garden Planting

**May 19, June 10**

CoNPS has received a People and Pollinators Grant to install two native plant gardens at Sunset Vista Natural



Area in Loveland. Both are near the popular Long View bike trail at 57th St and Taft. Initial site preparation and planting will occur in May and early June. Afterwards, we will need help watering.

One of the gardens will be a dry prairie site located in front of the historic stone cottage (pictured). The other will be a mesic-wetland site located nearby along the southern route to the Loveland North Trail.

### Harlequin's Gardens

**May 23, June 1, and June 8**

Please come join us to support our CoNPS Plant Sale partner and sponsor, Harlequin's Gardens. We will have at least monthly volunteer events at Harlequin's throughout the year. Each time, we might engage in different conversations and volunteer work. Activities include donating seed, propagating plants, and mulching.

## Media Committee

**Meets on third Tuesdays of the month**

**8:00 - 9:00 AM, virtual**

**Led by Kelly Ambler**

The Media Committee has been exploring ways to inform the general public about the importance of native plants. As such, we plan on distributing print copies of *Aquilegia* to libraries and other entities.

And are you attending any CoNPS-sponsored events this summer? How about submitting a summary and/or photos of your activity to *Aquilegia* or posting on social media? We would love to hear from you!

## Restoration Committee Meeting

**Meets on third Wednesdays of the month**

**12:00 - 1:00 PM, virtual**

**Led by Maggie Gaddis**

The Restoration Committee is meeting independently once again and is working on defining the committee's role in restoration projects while continuing to develop our partnership with the US Forest Service and their native seed collection project beginning in 2023. Please sign up and attend our Zoom meetings to help launch this important work.

The Restoration Committee is the main vehicle for our USFS-CNHP partner project entitled *Development of the Rocky Mountain Region Native Plant Materials Program*. For this program, we are working to develop a native plants database to assist USFS Region 2 Rangers in selecting seed for restoration efforts. We will be collecting seed to support this program. If you are interested in being trained and attending these seed collection events, please attend Restoration Committee meetings. ►

## CoNPS Chapter Updates

### ◀ Boulder Chapter

The chapter steering committee is planning several summer field trips, excursions to learn about research projects in Spruce Gulch, Boulder County *Bromus tectorum* controls in June, and outings to explore flora in the Hessie area in July. Information about each trip will be posted in the state events calendar as the details are confirmed.

### Metro-Denver Chapter

#### Denver Pollinator Native Plant Swap & Give-Away June 24, hosted by CoNPS, Wild Ones, Earthlinks, People and Pollinators Action Network

Bring propagated or salvaged native plants to share. Or just drop by to learn more about natives and pick up new-to-you plants. Attendance does not require you to bring plants, but we hope that many of you will be willing to share the plants you have received from past seed and plant swaps.

### Northern Chapter

#### NOCO Xeriscape Party and Native Plant Swap June 17, hosted by CoNPS, People and Pollinators Network, League of Women Voters Habitat Pollinator Group, Wildlands Restoration Volunteers, Front Range Wild Ones, and City of Fort Collins.

CoNPS will be running a booth and **we will need volunteers**. Last year the response was overwhelming, with folks three deep at our booth. You can bring plants to the event to "swap", but you don't have to.

### San Luis Valley Chapter

The San Luis Valley Chapter is hosting the **CNHP Rare Plant Symposium** and **CoNPS Annual Conference** September 22-24 at Adams State University in Alamosa, CO. The topic is *Flora of the San Luis Valley: History, Culture, and Science*.

## CoNPS Field Trips

**Note:** Most botany hikes have a 15-person limit. Please register to secure your spot: <https://conps.org/home-2/events/event-calendar-2/#!calendar>. If you need to cancel, please contact your field trip host or the central office so someone from the waitlist can join the event.

#### Aiken Canyon Preserve May 19, led by Tom Green

Since 1991 the 1600-acre Aiken Canyon Preserve has been managed by the Nature Conservancy to protect a "treasure trove of plant and animal communities", such as pinyon-juniper-needlegrass and Gambel oak-

mountain mahogany habitats. Over 100 bird species and 300 species of plants are listed for the preserve. We will hike the moderate 4-mile loop trail, at an elevation between 7500-8000 ft. Time and interest permitting, we may hike the canyon trail to a small aspen grove by a homestead ruin, which adds another 1.5-2.0 miles. We will hike slowly to give time to identify and photograph plants.

#### Durango Skyline Trail Hike May 20, led by Karen Hwang

Some of the plants to expect are *Townsendia*, lupines, balsamroot, bluebells, candytuft, rockcress, early larkspur, *Clematis*, and much more, including several species of cacti on the ridge. We will hike through a shrubby woodland of ponderosa pine and Gambel oak, a Douglas fir forest, a small grove of white fir, and pinyon-juniper habitat on the sunny, sandy ridge top.

#### Tour of Houston Gardens in Greeley May 22, led by Ann Grant

Billed as "Greeley's Best Kept Secret", this community garden features five ecosystems of Colorado. Hike is rated as easy.

#### Enchanted Mesa Wildflower Walk May 24, led by Barbara Fahey

Come explore the spring wildflowers of Enchanted Mesa on a short but at times steep and rocky hike that has a diversity of wildflowers, shrubs, and trees along with stunning views of the Flatirons. Barbara Fahey, founder of CSU's Native Plant Master Program, will share the identities, lifestyles, friends, and foes of the many spring bloomers we'll see. All are welcome, but this walk is especially suited to those new to Colorado wildflowers.

#### Spruce Mountain Open Space May 26, led by Maggie Gaddis

Starting at the east trailhead, we will go along the easy Meadows Trail and the Eagle Pass Trail Cutoff. The group will go at a slow pace to allow time to identify species and take photos. We should see prairie Pasqueflower, *Pulsatilla nuttalliana*, and Rocky Mountain spring beauty, *Claytonia rosea*. Anyone who wants a longer and more strenuous hike can take the Eagle Pass Trail/Service Road to the top where you may find larkspur, *Delphinium nuttallianum*, blue-eyed Mary, *Collinsia parviflora*, and slender phlox, *Microsteris gracilis*.

#### Joder Jaunt May 31, led by Pat Butler and Lynn Riedel

Late afternoon stroll on the west side of the city's Joder Ranch Habitat Conservation Area to see what's blooming – always something interesting in a relatively short distance. After a short steep 80 foot climb, the trail is fairly flat. Bikes, hikers, and dogs use this trail. ►

◀ **Ute Indian Museum Ethnobotany Garden Tour**  
**June 1, led by Jim Pisarowicz**

Enjoy a guided tour of Ethnobotany Garden and learn about native plants used culturally, ceremonially, and medicinally by the Ute People.

**Paint Mines Interpretive Park**  
**June 2, led by Curt Nimz**

We will do an easy walk/hike along the trails in the Paint Mines Interpretive Park in eastern El Paso County to look at the early season wildflowers. The main wildflower attractions are white penstemon, *Penstemon albidus*, hedgehog cactus, *Echinocereus viridiflorus*, downy paintedcup, *Castilleja sessiliflora*, and both red and yellow whole-leaf Indian paintbrush, *Castilleja integra*. The park also features fantastic geological formations including spires and hoodoos that form through erosive action that creates incised gullies and exposed layers of selenite clay and jasper.

**Spruce Gulch**  
**June 3, led by Tim Seastadt**

CU Professor Emeritus Tim Seastadt discuss grad student ecological research projects in Spruce Gulch, a watershed headwater flowing into Lefthand Creek. If you are so inclined, you can help remove spotted knapweed. Hiking in this area is strenuous due to downed trees and rock debris from the 2013 flood. But the Gulch is beautiful and worth the effort to see this otherwise non-public area.

**Durango Botanic Gardens Tour**  
**June 11, hosted by Durango Botanic Gardens**

Members of the Durango Botanic Garden will take us on a tour of the plantings, including some native species, around the Durango Public Library. We will enjoy a mix of crevice gardens, rock gardens, herb gardens, and more.

**Ranson/Edwards Homestead Open Space**  
**June 23, June 25, July 20, July 22**  
**Led by Tom Schweich**

**Reynolds Park**  
**June 29, led by Kelly Ambler**

Reynolds Park contains a wide variety of habitats in a relatively small area, which results in a great diversity of wildflowers. Ecozones range from riparian to foothills to ponderosa to montane. The most unusual plant of the area is the spurless Colorado blue columbine (*Aquilegia coerulea* var. *coerulea*). This variety lacks the typical long spurs and white petals. More than 70 species of wildflowers have been recorded in the park.

**Florissant Fossil Beds National Monument – Twin Rocks Trail**  
**July 1, led by Tom Green**

This is a moderate hike of about 6 miles with 600 feet of elevation gain. The trail begins at the old homestead

meadows and climbs a nearby hillside into a woodland of ponderosa and firs. The trail follows a small stream up to a pond, traverses a prairie dog colony, and ends at a majestic rock outcrop with a shady aspen glade where we turn around. We will hike at a slow pace to allow time for photos and plant identification.

**Alpine Hike**  
**July 13, led by Kelly Ambler**

We will explore the area around the Loveland Pass Lakes, located just south of the Pass. A wide range of alpine and subalpine plants should be present. The elevation changes around the Lakes are modest. Most of the travel will be on old jeep trails. If time permits, and there is interest, we can also look for plants at Loveland Pass and/or at pullouts along US6.

**Buckhorn Lakes Park, South Montrose**  
**July 14, led by Jim Pisarowicz**

Join us as we explore the Buckhorn Lakes areas, where we'll see many wildflowers and nonnative plants. We'll learn about the plants of this county park that is typically overlooked, except by people who fish the several lakes.

**Prairie Canyon Ranch**  
**July 15, led by Pam Schulz**

Prairie Canyon Ranch is a historic homestead in Douglas County featuring rock formations, a tributary canyon to Cherry Creek, and meadows. We will follow a moderate trail for 2-3 miles. There are rock edges, unsurfaced, uneven trail in parts, cacti, and potentially snakes. If you want to spend time identifying plants, bring your favorite reference book and hand lens.

**Todd Gulch Fen Phenology**  
**July 15, Led by Gwen Kittel**

Help us explore the Todd Gulch Fen in Boulder County. Learn how to use Budburst to support phenology monitoring.

**Coal Bank Pass & Pass Creek Trail**  
**July 18, led by Travis Ward**

We will slowly work our way up the Pass Creek Trail looking for as many flowering species as we can find (perhaps over one hundred). We will be using common names, but a handout will include scientific ones. It is a good trip for beginning botanists, or any wildflower enthusiast.

**Cottonwood Pass Wetland Meadow**  
**July 29, led by Birgit Semsrott**

We are going to explore the vegetation in the wet subalpine meadows just south of Cottonwood Pass. This will be a moderate hike of about 2 miles round-trip. Be prepared for wet meadows as well as mud and water on the trails. The trail is very steep in places.

**Chatfield Reservoir - Noxious Weed**  
**Date TBA, led by Denise Larson ▶**



## Cross-Pollination Events

### ◀ Denver Purge the Spurge

May 20, 8:00 AM - 3:00 PM

Harvard Park, 888 E. Iliff Ave., Denver, CO

In partnership with CSU's Annual 2023 Denver Master Gardner Plant Sale, Denver Parks & Recreation is holding their annual "Purge Your Spurge Event" that encourages Denver residents to eliminate myrtle spurge, an invasive plant species, from their yard in exchange for native plants.

In addition, DPR will be celebrating the City and County of Denver becoming certified as a "Community Wildlife Habitat" by the National Wildlife Federation. Through this program, communities work to become healthier, greener, and more wildlife-friendly by creating wildlife habitat throughout the community while educating and engaging residents through events, educational workshops, and hands-on service projects.

### Barr Lake State Park Bioblitz

June 3, 7:00 AM - 3:30 PM

Hosted by John Vickery and the Bird Conservancy of the Rockies

Join scientists and experts on short walks around Barr Lake State Park where you search for, identify, and record as many species as possible!

### Pollinators Will Have a Big Day!

June 17

The Colorado Pollinator Network (CPN) was established in 2016 for organizations and individuals throughout Colorado to collaborate to make a positive impact on the health of our state pollinators. This group shares information about the best practices, resources, and knowledge to support education initiatives, conservation, restoration, and creation of habitats and research on pollinators in the state. This June, CPN will host its 2nd annual summer pollinator count at Denver Botanic Gardens. Pollinator experts will be on hand to help with observations and identifications throughout the event, as well as tips on how to capture "research grade" photos.

Even if you can't make it to DBG, we are also encouraging native plant and pollinator enthusiasts across the state to go into their favorite natural areas, parks, and gardens and document what pollinators they see during this period and contribute to the iNaturalist page. Just like birders have their "big day", we're working to get as many people as possible to have a "bug day" in June to get a sense of what pollinators people are seeing.



Agapostemon bee on *Rudbeckia laciniata* (cutleaf coneflower). © Amy Yarger

This event is brought to you by CPN's planning partners: Butterfly Pavilion, Denver Audubon, Denver Botanic Gardens, People and Pollinator Action Network, and the Xerces Society.

### Other Events

May 14-20 Colorado Endangered Species Week

May 15-June 2 Citizen Science Meeting

<https://citizenscience.org/home/events/conferences/csci-2023/>

May 19 Endangered Species Day

<https://www.endangered.org/campaigns/endangered-species-day/>

May 20 Colorado Public Lands Day

<https://copubliclandsday.com/>

May 20 World Bee Day

<https://www.un.org/en/observances/bee-day>

June 5 World Environment Day

<https://www.worldenvironmentday.global/>

June 16-18 Wyoming Native Plant Society Annual Meeting

<http://www.wynps.org/events/>

June 18-24 National Pollinator week

<https://www.pollinator.org/pollinator-week>

June 26-29 North American Prairie Conference

<http://www.northamericanprairie.org/>

July 10-16 National Forest Week

<https://www.nationalforests.org/our-forests/national-forest-week>

July 21-24 American Penstemon Society Annual Meeting

<https://penstemons.org/index.php/annual-meetings>

July 22-26 American Bryological and Lichenological Society Conference

<https://ablsociety.wixsite.com/abls>

August 7 Colorado Day

August 17-20 Eriogonum Society Annual Meeting

<https://erigonum.info/> 🌀

# Become a CoNPS Member

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone \_\_\_\_\_  
 E-mail \_\_\_\_\_  
 Chapter (if known) \_\_\_\_\_

- New
- Renewal
- Student \$17
- Senior (65+) \$17
- Individual \$25
- Family \$35
- Plant Lover \$50
- Supporting \$100
- Patron \$250
- Benefactor \$500
- Life Member \$800

**Printed Color Copy** of the magazine, *Aquilegia*, \$20

**CHAPTERS:** Boulder, Metro-Denver, Northern (Ft. Collins-Greeley), Plateau (Grand Junction and West Slope), San Luis Chapter (Crestone, Alamosa, Salida), Southeast (Colorado Springs-Pueblo), Southwest (Durango), or Unaffiliated

If this is a change in address, please write your old address here.

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

**Check box to receive information on volunteer opportunities**

DUES include the electronic version of the *Aquilegia* magazine, published quarterly.

The full color electronic publication arrives by PDF in member email boxes in February, May, August, and December. For those members without email addresses, please apply for a scholarship to receive print copies.

Membership dues cover a 12-month period.

You may also join online at <https://conps.org/join-donate/>

**CONTRIBUTIONS** to CoNPS are tax deductible:

**John Marr fund** for research on the biology and natural history of Colorado native plants \$ \_\_\_\_\_

**Myrna P. Steinkamp Memorial fund** for research and other activities to benefit the rare plants of Colorado \$ \_\_\_\_\_

**Alice Eastwood Scholarship fund** to help support undergraduates pursuing bachelor's degrees that ultimately advance the mission of the Society \$ \_\_\_\_\_

**Mission Grant** to support the mission of the Society \$ \_\_\_\_\_

Total included: \$ \_\_\_\_\_

Please make check payable to:  
**Colorado Native Plant Society**

Send completed form and full remittance to:  
 CoNPS Office  
 1536 Wynkoop Street, Suite 911  
 Denver, CO 80202





# Can You Identify These Garden-Friendly Native Plants?



Answers (clockwise from upper left): prairie smoke (*Gum triflorum*, Rosaceae), owl's claws (*Hymenoxys hoopesii*, Asteraceae), scarlet gilia (*Ipomopsis aggregata*, Polemoniaceae), Richardson's geranium (*Geranium richardsonii*, Geraniaceae), mountain harebell (*Campanula rotundifolia*, Campanulaceae), and pearly everlasting (*Anaphalis margaritacea*, Asteraceae). <https://comps.org/home-2/resources/gardening-with-native-plants/> © Anna Wilson

# Colorado Native Plant Society



a non-profit organization dedicated to furthering the knowledge, appreciation, and conservation of native plants and habitats of Colorado through education, stewardship, and advocacy

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## Wanted!

### Hosts for the 2023 Garden Tours

Offer your garden to be included in this year's CoNPS Garden Tours! This is a great way to share our collective efforts and wisdom about gardening with Colorado native plants and to support the Society. We are seeking native gardens in all stages of development.

**To include your garden in the 2023 CoNPS Garden Tours, please fill out this form.**

<https://forms.gle/hKghpKmmCyPd3wT57>

## Mark Your Calendar!

### 47th Annual CoNPS Conference, September 23-24 *Flora of the San Luis Valley: History, Culture, and Science*

The 2023 CoNPS annual meeting, hosted by the San Luis Valley chapter, will be held in Alamosa at Adams State University.

#### Saturday, September, 23

**Kristy Duran**, *Ethnobotany in the San Luis Valley*

**Carol English and Matt Sharples**, *Flora of the San Luis Valley, La Botica*

**Peter Innis**, *Possible new species of sunflower in Great Sand Dunes National Park*

**Kate Schoenecker**, *Plant responses to herbivory by elk and bison*

**Maggie Gaddis**, *USFS Seed Collection and Restoration & other news from CoNPS*

**Arnold Clifford**, *Plants and Plant Use of the Navajo Nation*

**Sunday, September 24**  
Field trips

We are working on scheduling field trips! Interested in leading a field trip? Please contact [SLVchapterpresident@gmail.com](mailto:SLVchapterpresident@gmail.com)

**Registration starts in June**