



Plant Ecology

Boulder County

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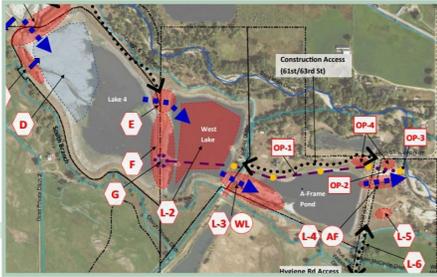
Samantha Bietsch

2020 Highlights

- ◆ Worked with a consultant to complete Phase 1 of a two-year project to assess and map emergent wetlands Countywide. Mapped 153 wetlands and assessed 46, across 5,600 acres on 29 properties.
- ◆ Contracted maintenance on six flood recovery projects across St. Vrain, Lefthand, and James Creeks.
- ◆ Collected 242 pounds of native seed of 34 species.
- ◆ Hosted 23, COVID-19 compliant, episodic volunteer events, generating 616 volunteer service hours.
- ◆ Reintroduced 50 Colorado Butterfly Plants, a formerly Federally Threatened species, to four locations on two properties.
- ◆ Conducted 61 vegetation monitoring transects on eight properties to collect data on flood recovery restoration, elk browsing impacts, grassland and riparian health.
- ◆ Completed the Reach 3 Phase 2 stream restoration project along the St. Vrain Creek.



Lake 4, West Lake, and A-Frame Reservoirs Flood Repair Project



Project Goals:

1. Repair four breached embankments on the Western Mobile, Braly, and Ramey properties that were damaged during the 2013 flood.
2. Establish new suitable habitat for the preble's jumping mouse by re-constructing the clough and true ditch and restoring the adjacent upland areas.
3. Revegetate the repaired embankments with native plant species and establish wetland vegetation along the waterlines.
4. Create habitat for native fish species in West Lake.



Plant Ecology Team Role:

1. Review project designs, approve submittals and attend weekly update meetings.
2. Develop four seed mixes and oversee revegetation efforts such as topsoil removal, application of soil amendments, drill seeding, and mulching to ensure project specifications were met.
3. Inspect equipment to ensure no invasive species were inadvertently introduced to the project site.
4. Conduct frequent site visits.
5. Assist project engineers, design groups and equipment operators to develop solutions to field conditions that deviated from the original project plans.



Vegetation Highlights

- Drill seeded 3.4 acres of upland habitat with a diverse seed mix, including 14 species of native grass, forb, and shrubs.
- Drill seeded 11.4 acres of embankment areas with native grass mix.
- Broadcast seeded 0.2 acres of wetland habitat near the water line of the restored lakes and outlet areas.
- Planted 850 *Carex sp.* plugs along the Lake 3 shoreline and outlet channel.



Reach 3 Phase 2 St. Vrain Stream Restoration



This multi-objective project targeted construction and restoration on approximately 0.6 miles of the St. Vrain Creek corridor between Lyons and Hygiene.

Project Goals included (but are not limited to):

1. Construction of a native fish passage-friendly, water control structure designed to deliver legally decreed water to Longmont Supply Ditch users, while facilitating native fish passage around the control structure.
2. Restoration of a fish passage stream channel adjacent to the Longmont Supply Ditch, including riffle-pool sequence construction, root-wad bio-stabilization, native tree and shrub planting, and native seeding.
3. Reconnect the creek with the floodplain, through overflow channel construction.
4. Improve habitat for the federally threatened Preble's Meadow Jumping Mouse.

Plant Ecology Role and Vegetation Highlights

- Reviewed and commented on plan design and specifications.
- Secured all plant material, including container stock and seed for restoration
- Handled project oversight, reporting, regular and as needed team meetings
- Planted 2,214 native trees and shrubs
- Installed 1,428 sandbar and peachleaf willow poles



Emergency Watershed Protection — Operations & Maintenance

Plant Ecology staff managed maintenance at nine restoration sites related to the 2013 flood. Those areas include the streams and channels that run through Brewbaker-Sorensson, Reach 3, Bielins-Hock, Wagonwheel Gap, Gold Run, Upper and Lower Fourmile, South St. Vrain, and Lower Boulder Creek.

- Between our staff, contractors, and volunteers, restoration sites were watered 102 times in 2020 among all sites.
- 124 trees were planted along Fourmile Canyon Creek, and 37 trees along Gold Run.
- Sites were maintained by additional plantings of smaller containers, by weeding manually and chemically, and by installing fencing to keep vehicles out of closed Boulder County Parks & Open Space (BCPOS)

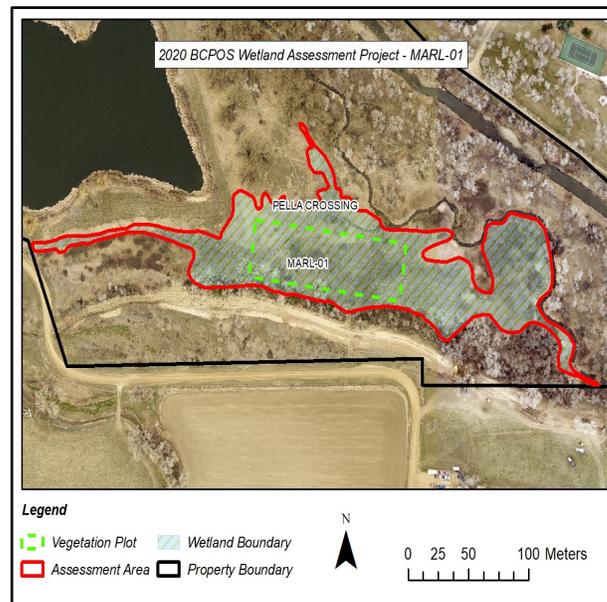


Staff and contractors water container plantings at Brewbaker-Sorensson in Summer 2020.

Phase 1 Wetland Assessment and Rare Plants

Wetland Mapping and Assessments

- Completed the first (of two) phases of the BCPOS Wetland Mapping and Assessment Project using the Ecological Integrity Assessment protocol developed by the Colorado National Heritage Program.
- Phase 1 included sub-meter GPS mapping of 153 wetlands (38 on mountain properties and 115 on the plains) and assessments (including a comprehensive species inventory) on 46 wetlands.
- 392 plant species were documented during the assessments. 312 native, 78 non-native, and two cryptogenic species (mixed-origin).
- Species diversity in the mountains ranged from 12 to 71 species per wetland. Species diversity in the plains ranged from 16 to 59 species per wetland.
- The final report and associated data are the most accurate and comprehensive information collected on BCPOS wetlands to date and will serve as a valuable management tool for the department.
- Preparation for the coming field season is already under way. Phase 2 will focus on 37 new properties, primarily in the southern half of the county.



Rare Plants

- Revisited historical populations and outplanted 50 individual plants of Wood Lily (*Lilium philadelphicum*), a species rare in the county, to various locations on BCPOS mountain properties.
- Outplanted 16 Colorado Butterfly Plant (*Oenothera coloradoensis*), a recently delisted Federally Threatened species, to suitable habitat in the county.



Monitoring and Mapping

Vegetation Monitoring

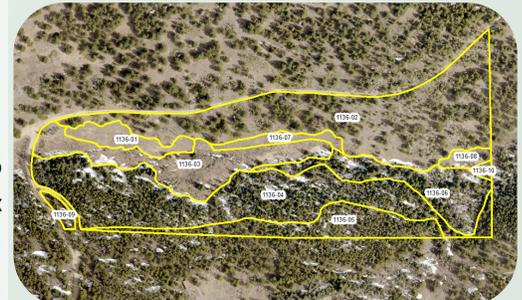
- Plant Ecology continued the Restored Grassland Monitoring program by establishing three transects and collecting baseline data on the Colp property.
- Collected baseline data on the Zapf property in the riparian zone with verified Preble’s jumping mouse occupation.
- Completed 36 vegetation transects for flood restoration, five of which were established in 2020 for the Reach 3 Phase 2 Project and another six established in 2020 on the James Creek Project.
- Revisited Elk Browse Monitoring at Rabbit Mountain was revisited by conducting 18 transects in meadows, shrublands, and in forest to track the effects of elk browse and the associated elk hunt on native plants.
- Completed 25 vegetation transects on three Emergency Watershed Protection (EWP) recovery projects to document revegetation success and trends.
- Collected information on plant survival at the Lower Boulder Creek



Above: Elk Browse monitoring at Rabbit Mountain.
Below: Vegetation mapped at Upper Sherwood Gulch.

Vegetation Mapping at Upper Sherwood Gulch

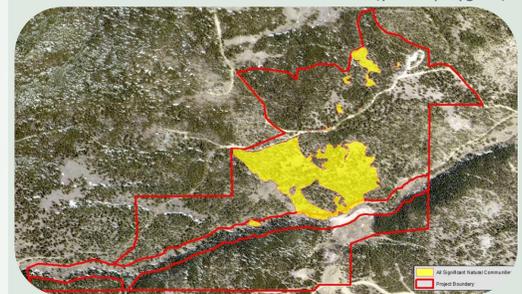
PE staff mapped the 14-acre Upper Sherwood Gulch property near Caribou to determine the vegetation communities present at the property. Six vegetation communities were mapped.



Below: Forestry Treatment outline (red line) and significant natural communities (yellow polygons).

Assessment, Recommendations for Forestry Treatment at Caribou and Sherwood Properties

153 acres were surveyed to highlight vegetation concerns in this forestry treatment area to mitigate damage to species of special concern, wetland and riparian areas, and to significant natural communities. Five significant natural communities were identified.



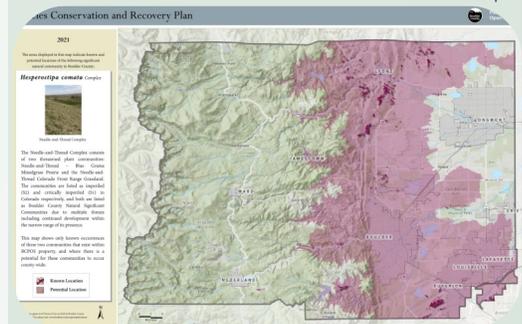
Below: Needle-and-Thread Significant Natural Community range and known location map.

Species Conservation and Recovery Plans

Plant Ecology staff completed 10 Species Conservation and Recovery Plans, including 5 Boulder County Species of Special Concern and 5 Significant Natural Communities.

Plant Ecology staff assisted GIS staff in the creation of range maps for all 10 species/communities by habitat modeling and querying of vegetation mapping.

Significant Natural Communities were visited and documented in 2020 to better understand community dynamics and composition.



Volunteer Program and Seed Collection

Due to COVID-19, there were constraints on volunteer projects throughout 2020. Group sizes were limited to 10 individuals (including staff); face masks and distancing requirements were strictly adhered to; and staff could not shuttle volunteers to worksites in county vans.

Volunteer Work Projects

- 23 episodic work projects—seed collections, seed cleanings, other
- 242 bulk pounds of native seed collected with volunteers and staff
- 34 different species collected
- 31 bulk pounds of seed cleaned
- 289 vole cages installed at Brewbaker stream restoration site
- 616 total service hours

Ongoing Volunteer Programs

- Native Garden Stewards: 13 volunteers, weekly gardening sessions in two alternating groups - 24 weeks, 355 service hours
- Weed Warriors: two volunteers, 152 pounds of Oxeye Daisy heads removed, 86 service hours
- 441 total service hours

Peck Native Seed Garden:

- 9th year of production (established 2012)
- 6 volunteer work projects hosted
- 9 species in production in 2020
- 175 bulk lbs. of native seed produced/harvested
- 286 plants planted
- 160 plants salvaged
- 132 total service hours (does not include Peck Garden Stewards service hours)



Pre COVID-19 Seed Cleaning





Resource Management Plant Ecology

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Our Mission:

As Plant Ecologists for Boulder County, we strive to preserve the health and diversity of our native flora and plant communities, as well as work to restore the vegetation and ecological functioning of our streams, wetlands, grasslands, and forest ecosystems impacted by human and natural disturbances.



Goals:

PROTECT

Identify, preserve, and maintain high quality native plant communities and landscapes.

RESTORE

Enhance wildlife habitat, ecosystem functions, and visitor experience through the restoration of degraded lands.

ENGAGE

Increase enthusiasm and support for native plants and their importance to ecosystem function and habitat.

