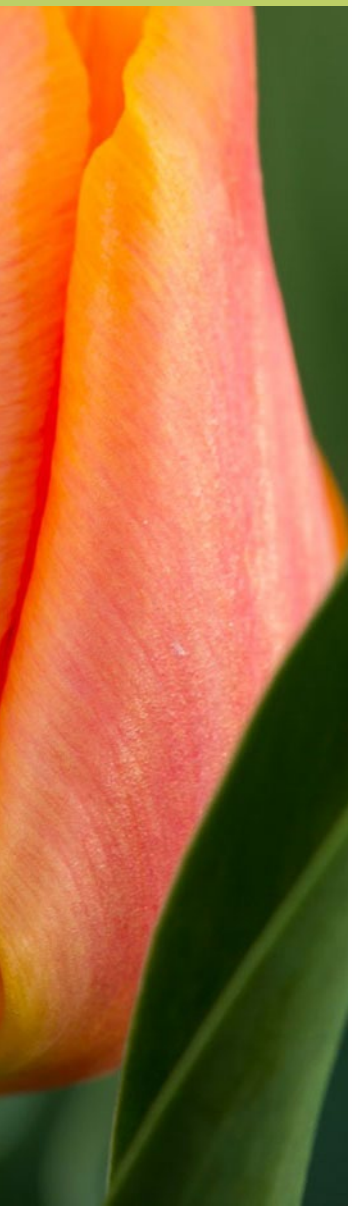
2022 Rare Plant Symposium

September 16, 2022

DENVER BOTANIC GARDENS



Long-term monitoring updates

Astragalus microcymbus – dry year

Penstemon harringtonii – visited last year, will visit again next year

Eriogonum brandegeei – did not find any seedlings marked in 2020 surviving but plants seemed ok

Sclerocactus glaucus – doing well,

Working to expand how we model population trends and deal with missing data

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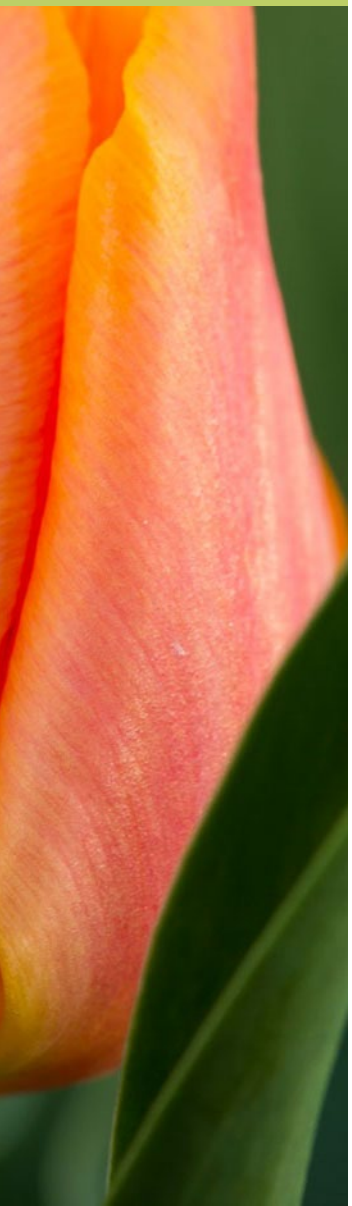

Sclerocactus glaucus study expansion

Proposed for delisting

- Tested distance sampling as plotless method to estimate total abundance and density

Seeds are dispersed by ants

- Counted ant nests
- Observed ant-seed interactions.

Climate change and habitat use can change plant communities

- Line-point intercept to quantify above ground vegetation
- Soil samples – seedling emergence to quantify species diversity in soil seed bank

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Ex situ collections update

2022 seed collections:

- *Cleome multicaulis* (new species to DBG seed bank)
- *Eutrema penlandii*
- *Oreoxis humilis* (new species to DBG seed bank)
- *Penstemon degeneri*
- *Physaria obcordata*

All collections in seed bank over 300 seeds have been tested for viability

Low germ % for some – not viable or germ conditions not optimal?

All new collections (since 2019) will continue to be tested for viability prior to going into storage

2023 collection plan: central mountains, SW mountains?

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Rare alpine climate research

Climate change study on germination and seedling stage in incubators

Physaria alpina

Townsendia rothrockii

+2°C and +4°C

Working on setting up long-term demographic study at Horseshoe Mtn.

Physaria alpina

Saussurea weberi

Measurements on size and reproduction to track change over time with increased warming

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Restoration Research

Partnership with the BLM

- Is there local adaptation?
- How should seed source impact creating climate-smart seed mixes?

Common garden experiment

2 climate treatments:

- warm/cool or wetter/ambient

4 species:

- *Artemisia frigida*
- *Penstemon virens*
- *Ericameria nauseosa*
- *Bouteloua gracilis*

Fitness traits: growth, survival, reproduction, flowering phenology

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Restoration Research

BLM sites near Canyon City

Using same seeds as common garden experiment

Seeding experiment testing impacts of single vs mixed population plots

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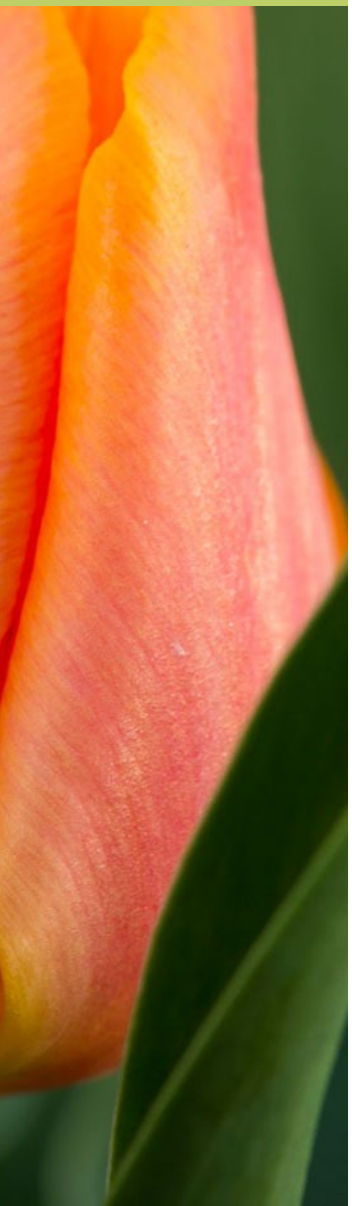

Montezuma County Collections

Met with Colorado Natural Areas Program amazing volunteers Marian and Peter Rohman.

Found a new species for the state of Colorado – *Aphyllon franciscanum*! It's host plant is usually *Eriogonum* and it has pointed corolla lobes.

Discovered this species again in Boulder County while looking for *Physarias*.

Keep a look out for *Aphyllon* on *Eriogonums*!

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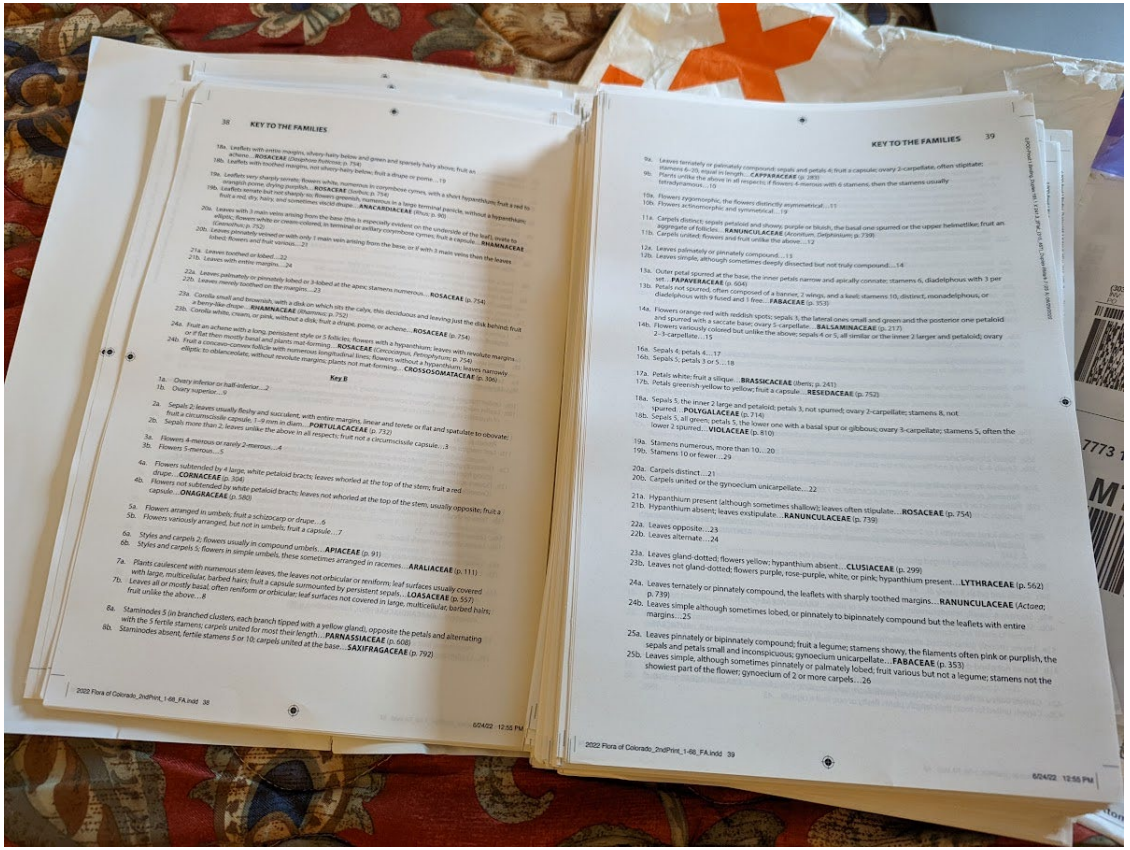
2nd Edition of *Flora of Colorado*

Jennifer Ackerfield's *Flora of Colorado*, Second Edition will be out mid-November!

Highlights include 122 new taxa, 35 additional color plates, and dot distribution maps



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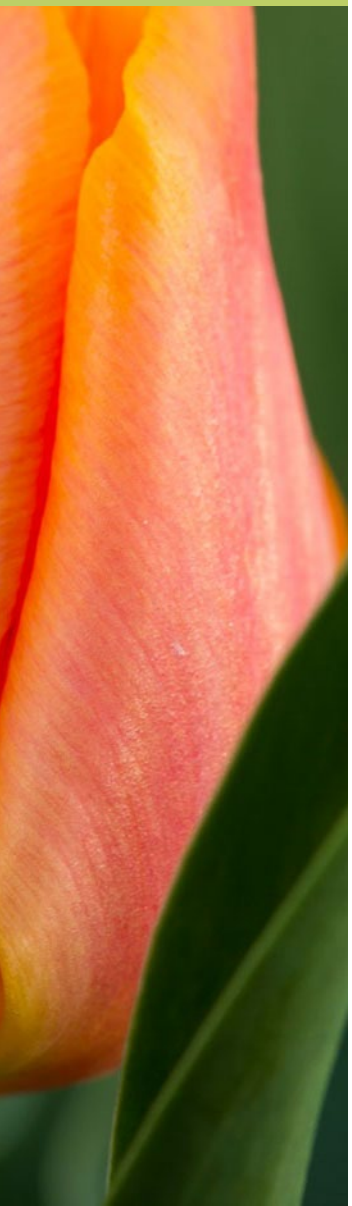


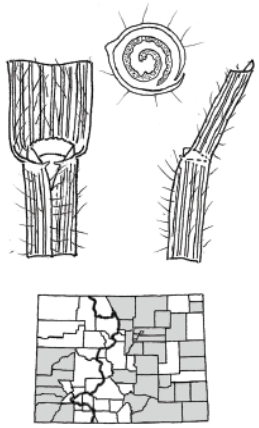
New edition of vegetative grass key

Janet Wingate is nearly finished with a revision of Harrington and Durell's 1944 "Keys to some Colorado grasses in vegetative condition"

New edition will be available for sale through the Colorado Native Plant Society

Species descriptions

Aegilops cylindrica Host, GOATGRASS. **Plants** annual. **Culms** erect to decumbent at the base. **Vernation** rolled (convolute). **Sheaths** open; hyaline margins, sometimes ciliate; usually sparsely long-hirsute. **Ligules** short-membranous; about 0.5 mm long; truncate. **Auricles** present, but not conspicuous, scarcely 0.5 mm long; ciliate. **Blades** flat; spreading; 2–3(5) mm wide; 3–15 cm long; usually long-hirsute. **Habitat**: Fields, roadsides, disturbed sites. 3300–8000 ft. **Comments**: *Aegilops cylindrica* hybridizes with wheat and is considered a serious weed in wheat fields. Native to Central Asia and Mediterranean regions. Widespread weed in North America. **Group 3,** pages 15.



Agropyron cristatum (L.) Gaertn. CRESTED WHEATGRASS. **Plants** perennial, bunchgrass, lacking rhizomes. **Vernation** rolled (convolute). **Sheaths** open; nearly round; glabrous or sometimes pubescent on lower sheaths. **Ligules** membranous; about 0.5 mm long (sometimes to 1.5 mm long); collar-shaped; margins short-fringed to short-ciliate, glabrous otherwise. **Auricles** rather small, < 0.5(1) mm long. **Blades** 2–7 mm wide, 5–20 cm long; nearly flat in section; usually pubescent or scabrous above; margins weakly scabrous; nerves raised above, the mid-nerve rather prominent below. **Habitat**: Dry grasslands, revegetated areas, disturbed sites. 3300–9500 ft. **Comments**: Used for soil stabilization and revegetation. Native to Asia and Europe. **Group 3,** page 17.