

Pro-pollinator
advocacy in the
Loveland area
and...



Which native
“pollinator” plants
should you plant?



Native bumblebee on native Lewis Flax (*Linum lewisii*)



Which Native Plants Should You Plant?

Sidebells Penstemon (*Penstemon secundiflorus*)
and Fringed Sage (*Artemisia frigida*)

What we'll cover

1. Native: What does it even mean?
2. What ecoregion do and your plants live in?
3. What's wrong with using non-native plants?
4. What are keystone species?
5. Blah, blah, blah... WHAT TO PLANT?
6. Q&A

Rocky Mountain Bee Plant (*Cleome serrulata*, *Cleomella serrulata*)



What is a “native” plant?

- Naturally occurring in a place for millenia
- Local existence NOT the result of human activity
- Co-evolved with other flora and fauna
- Part of a natural, established food web and ecosystem
- Adapted physically, chemically, genetically to location
- Native ≠ Xeric



Native bumblebee on native Lewis Flax (*Linum lewisii*)

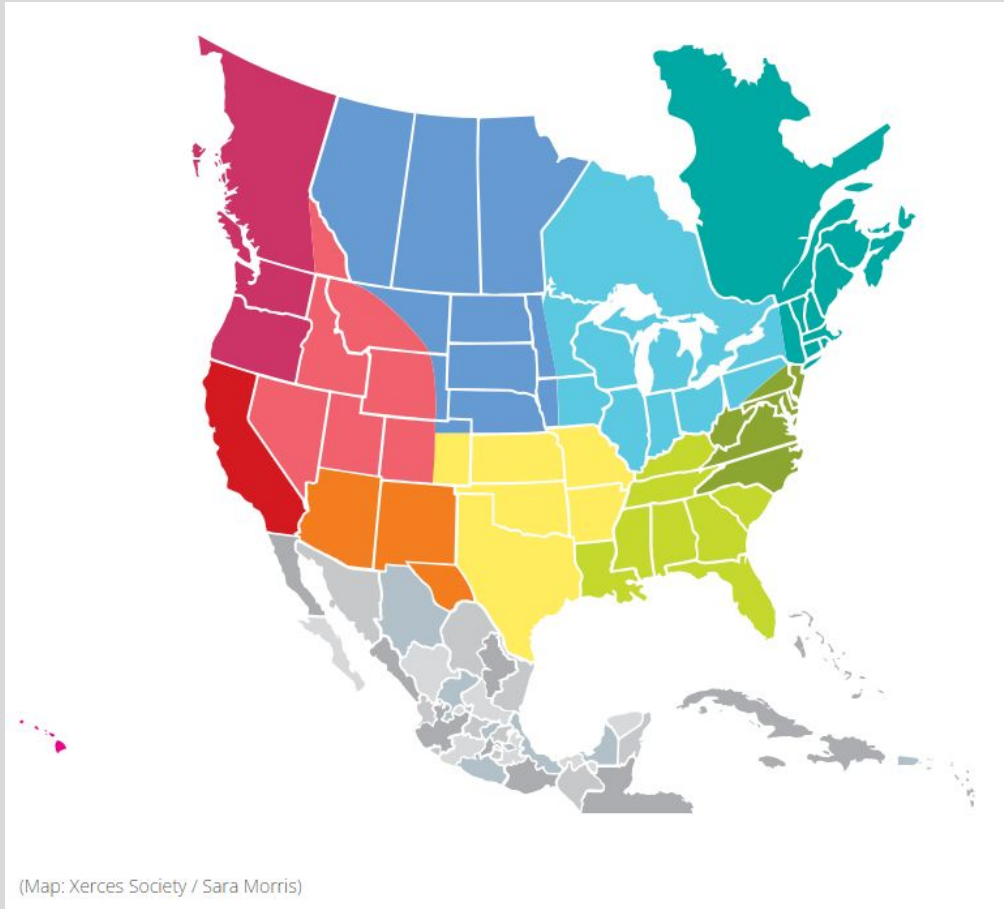
Where to draw the line?

Native to...

- Colorado
- Region: CO, AZ, NM, NE, TX, WY...
- Great Plains or Rocky Mountains
- North America

Threadleaf giant hyssop (*Agastache rupestris*),
native to Arizona and New Mexico



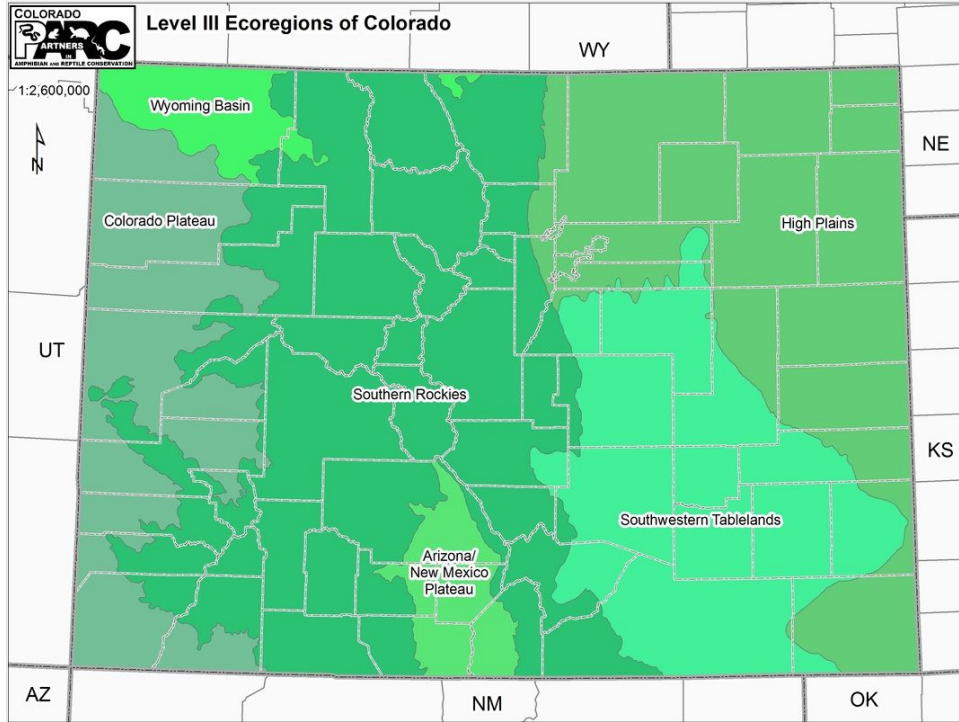


Regions & Ecoregions

Their edges are nature's boundary lines

Distinct plant communities & wildlife in each

LEVEL III ECOREGIONS OF COLORADO



Source for Ecoregion data: http://www.epa.gov/wed/pages/ecoregions/co_eco.htm

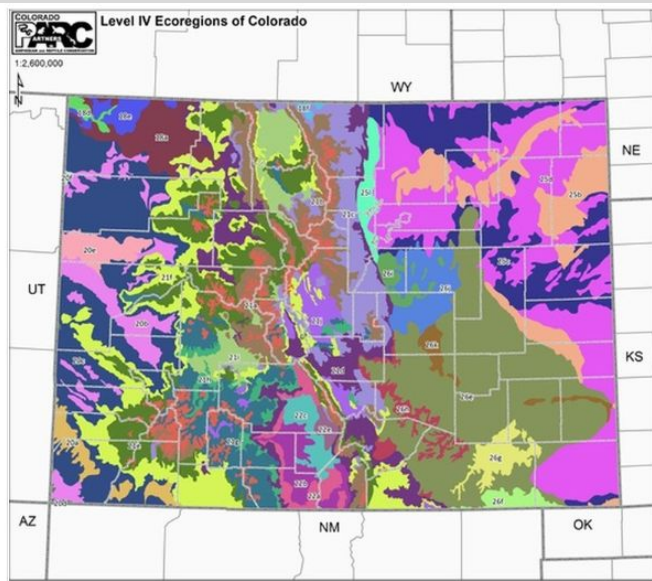
Last Updated: March 2014.

Colorado's Ecoregions

Colorado has 6 “Level III” ecoregions

Larimer County has 3

- High Plains
- Wyoming Basin
- Southern Rockies



Ecoregion Level IV

- | | |
|---|---|
| 18a Rolling Sagebrush Steppe | 21i Sagebrush Parks |
| 18d Foothill Shrublands and Low Mountains | 21j Grassland Parks |
| 18e Salt Desert Shrub Basins | 22a San Luis Shrublands and Hills |
| 18f Laramie Basin | 22b San Luis Alluvial Flats and Wetlands |
| 20a Monticello-Cortez Uplands | 22c Salt Flats |
| 20b Shale Deserts and Sedimentary Basins | 22e Sand Dunes and Sand Sheets |
| 20c Semi-arid Benchlands and Canyonlands | 25b Rolling Sand Plains |
| 20d Arid Canyonlands | 25c Moderate Relief Plains |
| 20e Escarpments | 25d Flat to Rolling Plains |
| 20f Uinta Basin Floor | 25i Front Range Fans |
| 21a Alpine Zone | 26e Piedmont Plains and Tablelands |
| 21b Crystalline Subalpine Forests | 26f Mesa de Maya/Black Mesa |
| 21c Crystalline Mid-Elevation Forests | 26g Purgatoire Hills and Canyons |
| 21d Foothill Shrublands | 26h Pinyon-Juniper Woodlands and Savannas |
| 21e Sedimentary Subalpine Forests | 26i Pine-Oak Woodlands |
| 21f Sedimentary Mid-Elevation Forests | 26j Foothill Grasslands |
| 21g Volcanic Subalpine Forests | 26k Sandsheets |
| 21h Volcanic Mid-Elevation Forests | |

Wait. How many?

Colorado has 35 “Level IV” ecoregions

Larimer County has 8

From <http://www.coparc.org/colorado-maps.html>

Source for Ecoregion data:

http://www.epa.gov/wed/pages/ecoregions/co_eco.htm

Last updated: March 2014

Larimer County



- Flat to Rolling Plains
- Moderate Relief Plains
- Front Range Fans (dense population)
- Foothill Shrublands
- Crystalline Mid-Elevation Forests
- Light Blue - Laramie Basin
- Crystalline Subalpine Forests
- Alpine Zone

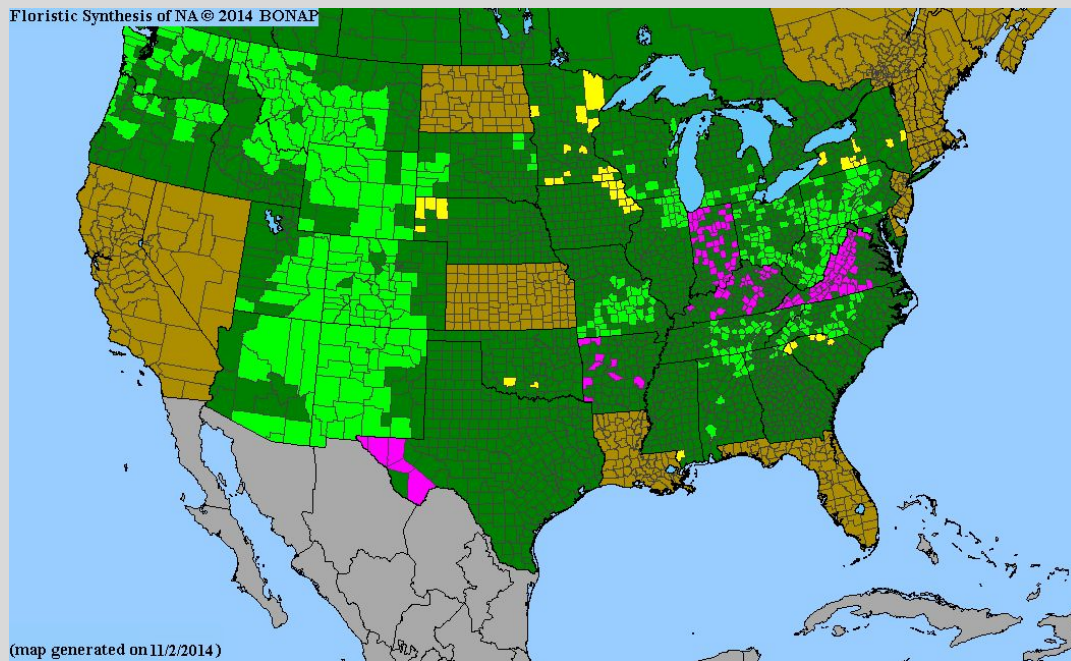
How do I know what's native?

Start with these references:

- **BONAP** (Biota of North America Program), bonap.org
- ***Flora of Colorado***, Ackerfield

Or just buy plants from Loveland's
**High Plains Environmental
Center**

- Not all LC or CO natives
- But ALL regional natives



Where nodding onion (*Allium cernuum*) is native, BONAP (Biota of North America Program), <http://bonap.org/>

Aim for at least 70% native plants

You'll use less water AND...

- More likely to support needs of local pollinators, especially the specialists
- Birds will find sufficient larvae for their young
- Enough host species to support ecosystem
- Natural balance enhances biodiversity (no monocultures)
- Greater ecological bang for your buck

White: Prickly Poppy (*Argemone polyanthemus*)
Yellow: Stiff Greenthread (*Thelesperma filifolium*)
Gray: Fringed Sage (*Artemisia frigida*)



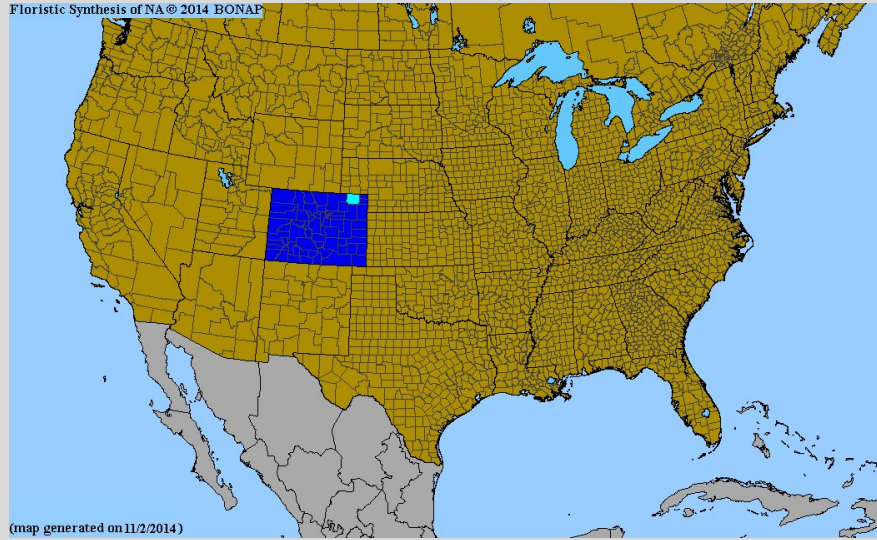
What's (possibly) wrong with non-native plants?

- Often nothing, but ecologically best used in combination with (and outnumbered by) natives
- Uncertain value to local pollinators, other beneficial bugs, wildlife (*e.g., butterflybush: good nectar for adults, but caterpillars don't eat it*)
- Potential to become invasive, create monocultures, choke out natives
- 39% of Colorado's listed noxious weeds are garden escapes, imported ornamentals

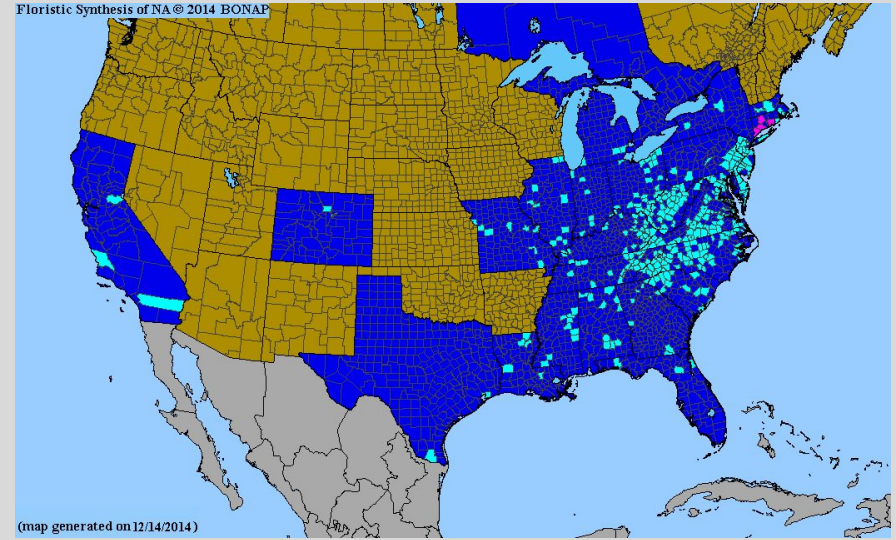


NON-NATIVE Chinese silvergrass (*Miscanthus sinensis*), now "listed" in 14 states. Reported "escapes" in Colorado.
Photo: James H. Miller, USDA Forest Service, bugwood.org

“BONAP Blue” - Exotic species gone wild



Supposedly sterile, European-Asian hybrid ‘Karl Foerster’ feather reed grass (*Calamagrostis X acutiflora*) is starting to naturalize itself in Colorado (Logan County).



Imported Chinese silvergrass (*Miscanthus sinensis*), is spreading widely (incl. Boulder County) and has achieved noxious status in certain places (note pink areas).

Some landscaping favorites gone bad:

- **Burning Bush** (*Euonymus alatus*) - now “noxious” in 21 states
- **Bradford/Callery Pear Trees** (*Pyrus calleryana* cultivars) banned in at least 3 states, listed “invasive” in 15 states
- **Common Periwinkle** (*Vinca minor*) listed “invasive” in 14 states
- **Butterfly Bush** (*Buddleja davidii*) listed “invasive” in 9 states



Photo: [Euonymus alatus Toronto.jpg](#) by Mykola Swarnyk, [CC BY-SA 3.0](#), via Wikimedia Commons

Next-Gen Noxious Weeds?

aggressive non-natives to avoid in Colorado



Catmints
(*Nepeta* species)



(“sterile” hybrid found to spread!)



‘Sapphire Blue’ Sea Holly
(*Eryngium amethystinum*)



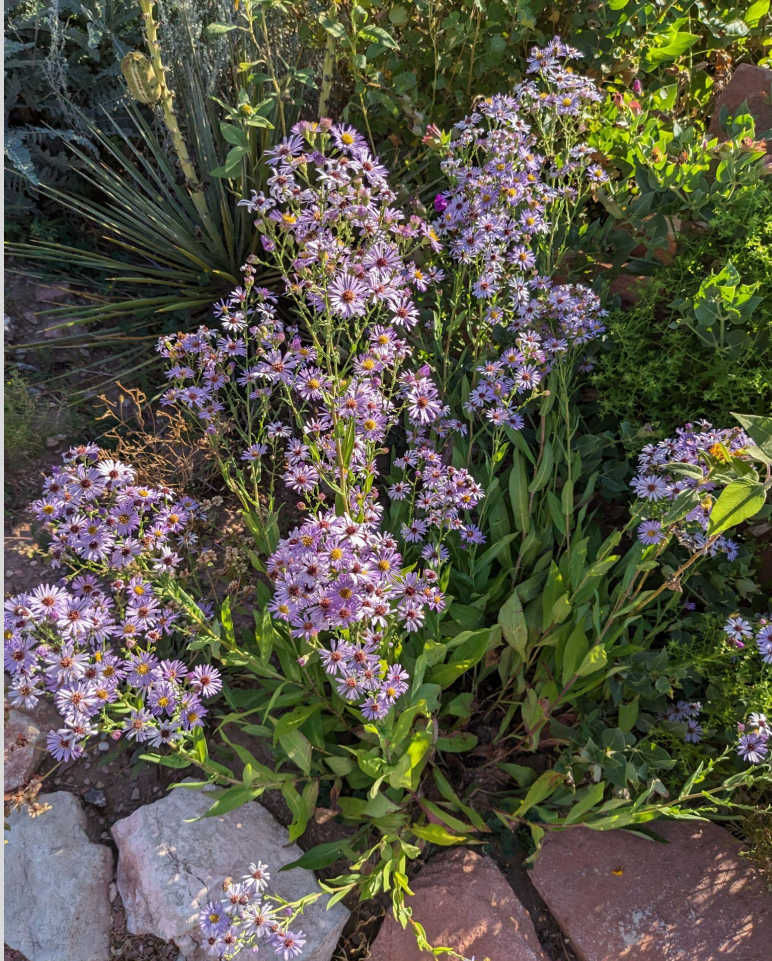
“Eryngium amethystinum ‘Sapphire Blue’ in the Humboldt Botanical Garden” by Krzysztof Ziarek, Kenraiz, CC BY-SA 4.0
<https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons

Russian Sage
(*Perovskia atriplicifolia*,
Salvia yangii)



Perovskia atriplicifolia, taken in Berlin-Kreuzberg By Atarax42 - Own work, CC BY-SA 4.0,
<https://commons.wikimedia.org/w/index.php?curid=93682936>





What are keystone species?

Smooth blue aster (*Symphyotrichum laeve*) -
Symphyotrichum species serve 43 specialist bee species and host 7 caterpillar species.

They make it all work

Keystone plants & animals are:

- Unique to the food web of an ecosystem
- Needed by many local species to complete their life cycles
- Critical to sustaining a diverse environment
- Key: Remove them and the ecosystem collapses

Purple Prairie Coneflower (*Dalea purpurea*)



Without them...

According to the National Wildlife Federation:

- “Without keystone plants in the landscape, butterflies, native bees, and birds will not thrive.”
- “96% of our terrestrial birds rely on insects supported by keystone plants.”

Hairy False Goldenaster (*Heterotheca villosa*) - serves 56 specialist native bee species and hosts larval stages of at least 6 butterfly species.





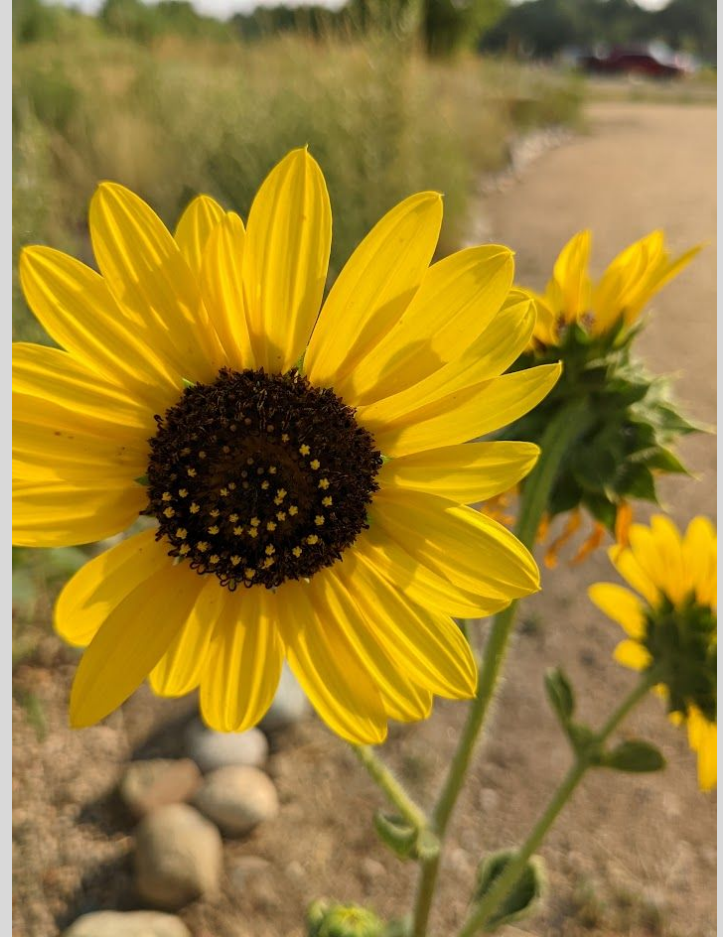
The Best Hyper-Local Native Plants for Our Birds, Bees, and Necessary Bugs

Bee balm or wild bergamot (*Monarda fistulosa*) in front of
silver sage (*Artemisia ludoviciana*)

Helianthus species

Sunflowers

- 6 species native to Larimer County
- 2 rather scraggly annual species
 - *Helianthus petiolaris* (plains sunflower)
 - *Helianthus annuus* (common sunflower)
- Hosts for 39-58 caterpillar species
- Serve 81-89 specialist bee species
- Lots of birds, including 2 kinds of goldfinches
- Keep at least some if you have them!



Helianthus pumilus

Bush Sunflower, Dwarf Sunflower

- Perennial
- Blooms June - August
- Hosts 50+ caterpillar species
- Serves 80+ specialist bee species
- Birds! Attracts goldfinches, siskins, grosbeaks...
- Prefers dry, rocky soil
- 20" tall x 24" wide; good choice for hell strips



Helianthus nuttallii

Nuttall's Sunflower

- Perennial
- Blooms July - September
- Hosts 40+ caterpillar species
- Special value to native bees
- **High water needs**
- Usually 2-6' tall, 1-5' wide



Eriogonum jamesii

James' Buckwheat, Antelope Sage

- Blooms June - July
- Serves many invertebrates: larval & adult stages
- Special value to native bees, attracts lots
- Full sun, very low water
- Gravelly, sandy, or clayey soil (well-draining)
- Groundcover habit (~10" tall x 15" wide)
- Shown here with blue grama (*Bouteloua gracilis*)

Photo: Colorado Springs Utilities,
<https://www.waterwiseplants.org/find-a-plant/james-buckwheat/>



Eriogonum umbellatum

Sulphur-flower Buckwheat

- Blooms June - July
- Hosts larval stages of several butterflies
- Serves adult stages of many pollinators
- Full sun, very low water
- Gravelly, sandy, or clayey soil (well-draining)
- Groundcover habit (~10" tall x 15" wide)



Geum triflorum

Prairie Smoke

- Blooms June - July
- Hosts larval stages of at least 6 specialist butterfly species
- Caters to adult stages of 2 specialist butterfly species
- Special value to native bees, attracts lots
- Full sun, very low water
- Gravelly, sandy, or clayey soil (well-draining)
- Groundcover habit (~10" tall x 15" wide)

Photo: Paul Henjum, public domain



Heterotheca villosa

Hairy False Goldenaster

- Blooms May through October
- Host plant for at least 6 caterpillar species
- Needed by 50+ specialist native bee species
- Full sun, Very low water
- Gravelly, sandy, or clayey soil (well-draining)
- Groundcover habit (6" tall x 12" wide)
- Shown here with fringed sage (*Artemisia frigida*), with which it naturally occurs



Dalea purpurea

Purple Prairie Clover

- Blooms late June - early July
- Needed by 12 specialist native bee species
- Full sun
- Low to Medium water
- Gravelly, sandy, or clayey soil (well-draining)
- Good height for hellstrips (~18" x 18")



Gutierrezia sarothrae

Broom Snakeweed

- Blooms late Aug - Nov
- Serves 72 specialist native bee species
- Full sun
- Very low water
- Gravelly, sandy, or clayey soil (well-draining)
- Good height for hellstrips (~24" x 24")



Oenothera caespitosa

Tufted Evening Primrose

- Blooms May - August
- 11 specialist bees
- Hawkmoth larvae depend on this genus
- Needs hawkmoths (a.k.a. sphinx or hummingbird moths) for pollination
- Full sun
- Low water, excellent drought tolerance
- Gravelly, sandy, or clayey soil
- Good height for hellstrips (6" x 15")



Solidago missouriensis

Missouri Goldenrod

- Blooms July - September
- Hosts 72 caterpillar species
- Serves 56 specialist bee species
- Full sun
- Low water
- Best goldenrod for dry soils
- Gravelly, sandy, light clay soil (well-draining)
- 1-3' tall x 1-2' wide



Solidago rigida

Stiff Goldenrod

- Blooms July - October
- Hosts 72 caterpillar species
- Serves 56 specialist bee species
- Full sun
- Low water
- Gravelly, sandy, or clayey soil (well-draining)
- 3-5' tall x 1-2' wide



Symphyotrichum ericoides

White Heath Aster

- Blooms August - October
- Hosts 7 caterpillar species
- Serves 43 specialist bee species
- Full sun, part shade
- Low water
- Dry, gravelly, sandy, or loamy soil
- 1-3' tall x 1' wide



Photo: Cody Hough, [CC BY-SA 3.0](#), via Wikimedia Commons

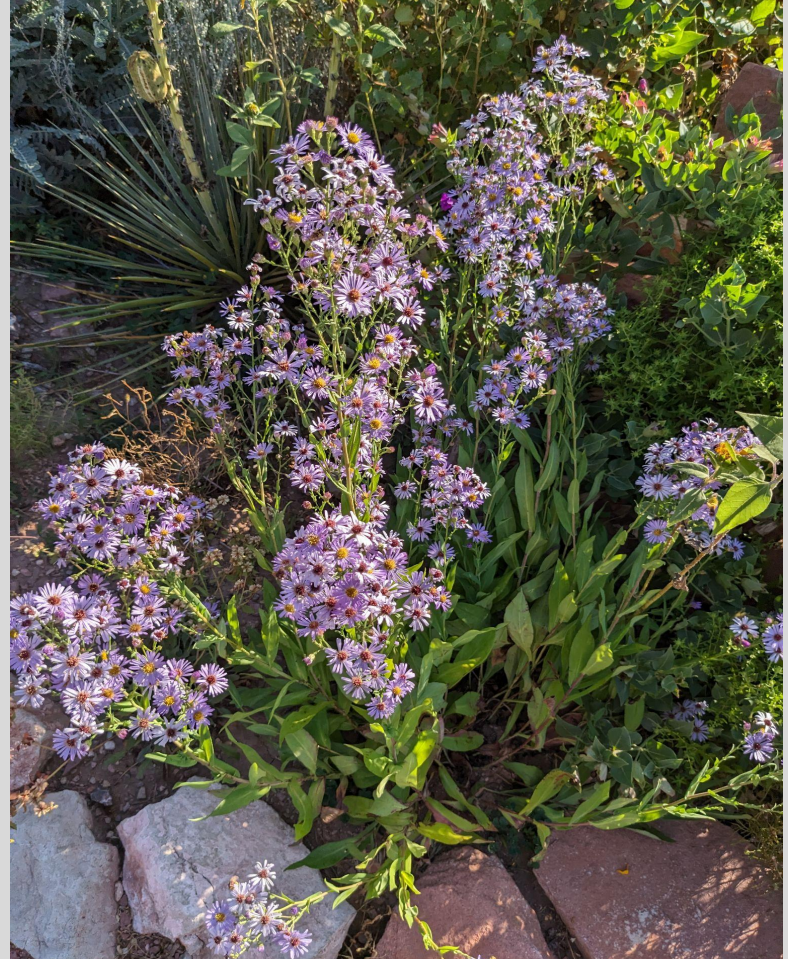
Also consider the similar

Symphyotrichum falcatum (White Prairie Aster)

Symphyotrichum laeve

Smooth Blue Aster

- Blooms August - October
- Hosts 2-7 caterpillar species
- Serves 16-43 specialist bee species
- Full sun, part shade
- Low to medium water
- Gravelly, sandy, or clayey soil (well-draining)
- 1-3' tall x 2' wide



Salix spp.

Willow species, e.g., Coyote Willow

- Blooms March - May
- Hosts 214-256 caterpillar species
- Serves 20-26 specialist bee species
- Full sun, part shade
- **High water needs**; likes moisture
- Consistently moist to wet sandy gravel (but well-draining)
- 4-15' tall x 15-20' wide



Rubus deliciosus

Boulder Raspberry, Thimbleberry

- Blooms May - June
- Hosts 80+ caterpillar species
- Serves 56 specialist bee species
- Full sun to part shade
- Low to medium water
- Gravelly, sandy, or clayey soil (well-draining)
- 3-5' tall x 2-5' wide



Amelanchier alnifolia

Saskatoon Serviceberry

- Blooms April - May
- Hosts 80+ caterpillar species
- Serves 69 caterpillar species
- Full sun to part shade
- Low to medium water
- Gravelly, sandy, or clayey soil (well-draining)
- 6-12' tall x 6-8' wide (multistem)
- Single-stem cultivars to 30'



Prunus pumila var. *besseyi*

Western Sandcherry

- Blooms April - May
- Hosts over 200 caterpillar species
- Special value to native bees
- Full sun to part shade
- Low water
- Gravelly, sandy, or clayey soil (well-draining)
- 4-6' tall x 4-6' wide



Ribes aureum

Golden Currant

- Blooms April - May
- Special value to native bees
- Flowers: hummingbirds, butterflies, bees
- Berries attract many birds
- Full sun to light shade
- Low to medium water
- Any well-draining soil
- 5' tall x 5' wide (multistem)



Photo: Margarete Steinhauer for the Colorado Native Plant Society.

Bouteloua curtipendula

Sideoats Grama

- Perennial warm-season bunchgrass
- Blooms July - September
- Hosts larval stages of several moth, butterfly species
- Source of nesting materials for native bees
- Best in full sun, tolerates light shade
- Low water
- Gravelly, sandy, loamy, or light clay soil
- 12-30" tall x 12-18" wide



Bouteloua gracilis

Blue Grama

- Perennial warm-season bunchgrass
- Blooms June - August
- Wind-pollinated, but seeds attract birds
- Hosts larval stages of satyr & skipper butterflies
- Full sun
- Low water, most drought tolerant CO grass; Needs less than 7" of rain
- Any well-draining soil
- 8-16" tall x 12-15" wide



Panicum virgatum

Switchgrass

- Perennial warm-season bunchgrass
- Blooms June - August
- Hosts larval stages of several skipper butterflies
- Source of nesting materials for native bees
- Best in full sun, tolerates light shade
- Medium to low water
- Any well-draining soil
- 3-4' tall x 2' wide



Photo: <https://www.etsy.com/listing/556622699/1000-switchgrass-tall-panic-switch-grass>

Schizachyrium scoparium

Little Bluestem

- Perennial warm-season bunchgrass
- Blooms June - August
- Overwintering host for larval stages of 9 skipper butterfly species
- Great nesting, roosting habitat
- Full sun, light shade
- Low to medium water
- Any well-draining, low-fertility soil
- 2' tall x 2' wide



Achnatherum hymenoides

Indian Ricegrass, Sand Ricegrass

- Perennial cool-season bunchgrass
- Blooms May - June
- Host for larval stages of several skipper butterfly species
- Full sun
- Low water
- Prefers sandy soil, dislikes clay
- 12-24" tall x 12-15" wide



Retune your landscape aesthetic

Some things to get our heads around:

- Ditch the “generic landscape”
- Functional is way better than ornamental;
Functional + ornamental is possible!
- Native plants look “right” in a geographical setting and offer a “sense of place”
- Celebrate unique characteristics of the local natural environment
- Consider the history of the lawn; reject that symbol of environmental hostility

Ten-petal stickleaf (*Mentzelia decapetala*), fringed and prairie sages (*Artemisia frigida*, *A. ludoviciana*), and other CO natives.



Plant a diverse landscape

Use annual & perennial flowers, grasses, shrubs, trees AND...

- Plant in layers mimicking nature:

Large tree canopy

Shrubs & small trees

Grasses & perennials

Groundcovers

- Copy nature's plant communities
- Ensure there's something blooming
May - October



Yellow: Sulphur-flower Buckwheat (*Eriogonum umbellatum*)
White background: Boulder Raspberry (*Rubus deliciosus*)
Front: Tufted Evening Primrose (*Oenothera caespitosa*)
Right: Indian Ricegrass (*Achnatherum hymenoides*)

Choose the “Right Plant for the Right Place”

Peruse plant lists/databases for your ecoregion

Match each plant’s soil, sun, moisture preferences to location conditions

Group plants into hydrozones!

Shop with a list of scientific names

Avoid Big Box Store seed mixes:
They’re not for YOUR landscape

Buy seed from Colorado vendors:

- Western Native Seed
- Miss Penn’s Mountain Seeds
- Pawnee Buttes Seed
- Alplains



Magenta: Colorado 4-O'Clock (*Mirabilis multiflora*)
Yellow: Bush Sunflower (*Helianthus pumilus*)

Avoid insecticides & herbicides

1. Let nature do its thing
2. Assess: Is control really needed?
 - Remove all A- & B-list noxious weeds: hand-pull, cut down/exhaust; reserve herbicide for the real problems.
 - Bugs: If plant health is at risk, hand-pick, hose down, or prune. Use insecticide as last resort.
3. Skip Big Box Store plantstock
 - Not grown in/for our ecoregion
 - Often pre-treated with insecticides

Native bumblebee on Golden Currant (*Ribes aureum*)





Sources for this presentation:

Ackerfield, Jennifer. (2015) *Flora of Colorado*, Fort Worth, TX: Botanical Research Institute of Texas.

Bein, Sierra. (September 5, 2020) “*Is It Time to Decolonize Your Lawn?*” The Globe and Mail. Accessed September 15, 2023 from <https://www.theglobeandmail.com/canada/article-is-it-time-to-decolonize-your-lawn/>

The Biota of North America Program, <http://www.bonap.org/> and its List by Genus, <http://www.bonap.net/Napa/Genus/Traditional/County>

Cohen, Adam. (October 31, 2018) “*Ecologists have this simple request to homeowners - plant native.*” Smithsonian Magazine. Accessed on September 15, 2023 from <https://www.smithsonianmag.com/smithsonian-institution/ecologists-have-simple-request-homeownersplant-native-180970655/>

“*Invasive and Exotic Species Profiles & State, Regional and National Lists.*” Center for Invasive Species and Ecosystem Health. <https://www.invasive.org/species.cfm>

“*Invasive plants are still for sale as garden ornamentals, research shows.*” UMass Amherst. (August 9, 2021). <https://www.umass.edu/news/article/invasive-plants-are-still-sale-garden-ornamentals-research-shows>

Noxious weed species ID. Colorado Department of Agriculture <https://ag.colorado.gov/conservation/noxious-weeds/species-id>

Presentation developed by Kathy and Maddie Maher.
Photos by Kathy Maher, unless otherwise noted.

Foreground: Great Plains Yucca (*Yucca glauca*)
White: Tufted Evening Primrose (*Oenothera caespitosa*)
Yellow: Sulphur-flower Buckwheat (*Eriogonum umbellatum*)



Resources

Colorado Native Plant Society website, Gardening with Native Plants page:

<https://conps.org/home-2/resources/gardening-with-native-plants/>

Colorado Native Plant Society's Native Plant Vendor List

<https://conps.org/wp-content/uploads/2021/06/CoNPS-Native-Plant-Vendors-12.pdf>

High Plains Environmental Center, Loveland

<https://suburbitat.org/native-plant-nursery-sustainable-stormwater-demo-area/>

Harlequin's Gardens, Boulder

<https://harlequinsgardens.com/plants/natives/>

Colorado eco-region plant guides compiled by partnering orgs: Colorado Native Plant Society, Butterfly Pavilion, High Plains Environmental Center, Wild Ones Front Range, CSU Extension Native Plant Master Program, and Denver Botanic Gardens, 2017:

<https://conps.org/wp-content/uploads/2022/03/FrontRange.pdf>

<https://conps.org/wp-content/uploads/2017/02/Native-Plant-Guide-Prairie.pdf>

<https://conps.org/wp-content/uploads/2017/02/Native-Plant-Guide-Mountains.pdf>

<https://conps.org/wp-content/uploads/2022/03/Southeastern.pdf>

<https://conps.org/wp-content/uploads/2022/03/WestSlopeSm.pdf>

Seed capsules, Large-flower Beardtongue
(*Penstemon grandiflorus*)





More Resources

The City of Fort Collins Recommended Plant List (filter on “Nativity”):

<https://www.fcgov.com/vegetation/>

The National Wildlife Federation

1. [Keystone Native Plants - Great Plains](#)
2. [Keystone Native Plants - Northwestern Forested Mountains](#)

The Xerces Society for Invertebrate Conservation: Plant lists by ecoregion:

1. <https://xerces.org/pollinator-resource-center/north-central>
2. <https://xerces.org/pollinator-resource-center/south-central>
3. <https://xerces.org/pollinator-resource-center/mountain-region>

The Lady Bird Johnson Wildflower Center: “special collection” and Colorado-specific lists:

1. <https://www.wildflower.org/collections/>
2. <https://www.wildflower.org/collections/collection.php?start=40&collection=C&pagecount=10>

The National Audubon Society’s Native Plant Database (search by zip code):

<https://www.audubon.org/native-plants>

Harebell (*Campanula rotundifolia*)



Thank you!

Questions?

For more information about the content of this presentation, contact:

Kathy Maher, kgmaher@yahoo.com

Foreground: Sand Sage (*Artemisia filifolia*)

Blue: Lewis Flax (*Linum lewisii*)

Background: Threeleaf Sumac, aka Skunkbush (*Rhus trilobata*)

Yellow: Sulphur-flower Buckwheat (*Eriogonum umbellatum*)