



CPW Invertebrate and Rare Plant Program

Hayley Schroeder, Invertebrate and Rare Plant Program Supervisor
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Outline

- Program Overview
 - Origin & Structure
 - Initial Priorities & Projects
- Rare Plants in the 2025 SWAP
 - History & Purpose
 - Required elements: process & results
 - Data hub demonstration



HB24-1117

Gave CPW statutory authority to study and conserve invertebrates and rare plants. No regulatory authority, but CPW can undertake all other conservation actions for their benefit.



HOUSE BILL 24-1117

BY REPRESENTATIVE(S) McCormick and Soper, Amabile, Bird, Boesenecker, Brown, Clifford, Jodeh, Kipp, Lindsay, Lindstedt, Marvin, Mauro, Parenti, Rutinel, Sirota, Titone, Velasco; also SENATOR(S) Marchman and Bridges, Buckner, Cutter, Danielson, Jaquez Lewis, Priola, Winter F., Zenzinger, Fenberg.

CONCERNING INCLUDING CERTAIN SPECIES UNDER THE AUTHORITY OF THE STATE AGENCIES THAT REGULATE PARKS AND WILDLIFE, AND, IN CONNECTION THEREWITH, MAKING AN APPROPRIATION.

Colorado Native Pollinating Insects Health Study



Steve Armistead, Adrian Carper, Deryn Davidson, Megan Blanchard, Jennifer Hopwood, Raven Larcom, Scott Black, Christy Briles, Rebecca Irwin, Garret Jolna, Julian Resasco, Seth Davis, John Mola, and David Inouye.



Rare Plant History at CPW



- The Natural Areas Program at CPW has been leading this work for decades in coordination with CNHP
- Raquel Wertsbaugh has been managing this program for the last 10 years
- SCIP, CNHP and CNAP will continue to work together going forward!



Program Structure



Invertebrate and
Rare Plant Program
Supervisor:
**Dr. Hayley
Schroeder**



Rare Plant Species
Conservation
Program Manager:
Savanna Smith



Pollinator
Conservation
Program Manager:
Dr. Adrian Carper



Western Invertebrate
and Rare Plant Field
Biologist:
Jake Gottschalk



Eastern Invertebrate
and Rare Plant Field
Biologist:
Dr. Megan Blanchard



Program Priorities



Conservation
Planning &
Partnerships



Education/
Outreach



Inventory &
Monitoring



Conservation
Action



Conservation Planning & Partnerships

Goal: Plug into and enhance collaborative efforts to advance rare plant conservation

- State Wildlife Action Plan
- Threatened & endangered species recovery teams
- Rare plant technical committee



Photo by Jessica Smith



Education & Outreach

Goal: Improve awareness about rare plants among conservation partners and the public

- Resources/trainings for CPW staff
- CPW media team- podcast, social media, blog



Research & Monitoring

Goal: Improve knowledge about where plants are and how they're doing across the state

- Initiate and continue trend monitoring for high-priority species
- Revisit historical locations
- Survey suitable habitat
- Chip away at information gaps for “Species of Greatest Information Need”





Raquel
Wertsbaugh



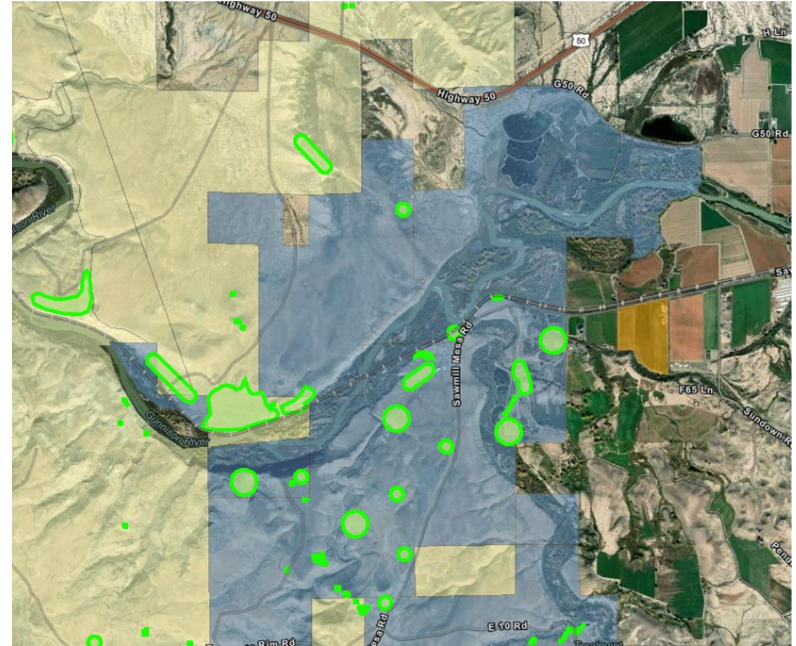
Lindsey
Conrad



Conservation Action- Land Use Planning

Goal: Integrate rare plants into statewide environmental planning efforts

- Energy developments
- Habitat improvements
- Recreation infrastructure
- Land protection



Conservation Action- Habitat Management

Goal: Encourage thoughtful management of existing rare plant occurrences

- Noxious weeds and herbicides
- Promote pollinators
- Fencing and signage



Conservation Action- Climate Resiliency

Goal: Evaluate and implement strategies to address the threat posed by climate change

- Ex-situ (off-site) collections, aka seed banking
- Strategy for reintroductions



Colorado 2025 State Wildlife Action Plan

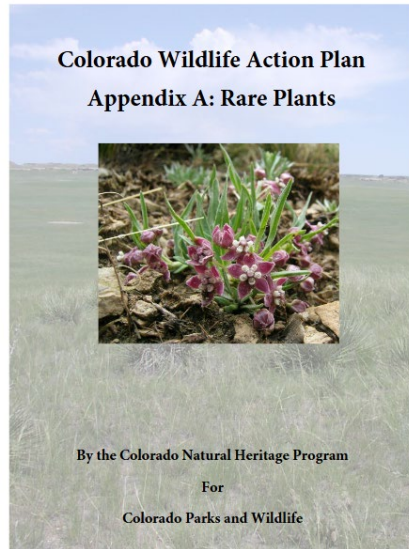
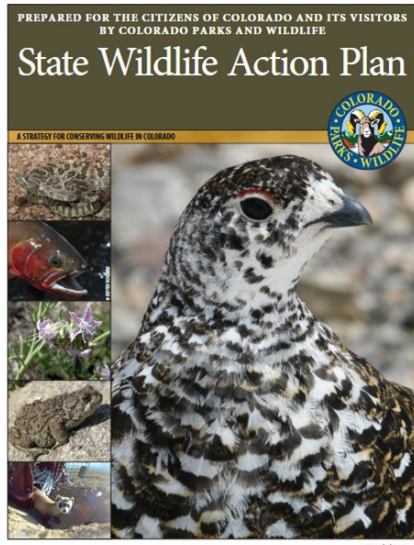


What is the SWAP?

- Guides Colorado's approach to conservation of vulnerable species and the habitats they depend on
- Required every 10 years for federal State & Tribal Wildlife Grants (SWG)
- Identifies Species of Greatest Conservation Need (SGCN) and much more
- Tool for collective action for SGCN



History



SWAP Required Elements

1. Species of Greatest Conservation Need (SGCN)
2. Habitats location and condition
3. Threats affecting SGCN and their habitats
4. Actions to conserve SGCN and their habitats
5. Monitoring of SGCN & habitats and evaluation of actions
6. Review and update SWAP every 10 years
7. Agencies and Tribes coordination
8. Public participation in planning AND implementation



Element 1: Species



SGCN Scoring Criteria



Tier 1

Mostly G1 & G2 species

- Most G1
- Most G2, except species with low % range in CO
- ESA listed or petitioned

Tier 2

Subset of G3 species + some G2

- G2 with low % range in CO
- G3 IF endemic or regional endemic or high % in CO
- All BLM/USFS sensitive G3

SGIN

Species lacking scientific info/low confidence in data

- Taxonomic uncertainty
- Other critical factors unknown (distribution, population status, threats)
- Many species with a large % of historical locations



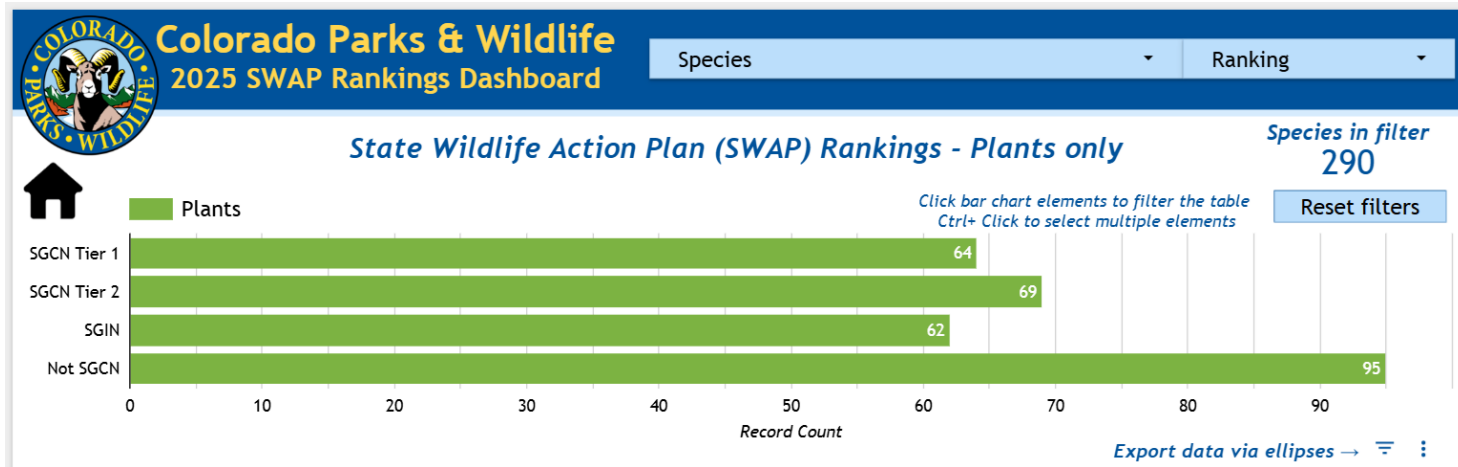
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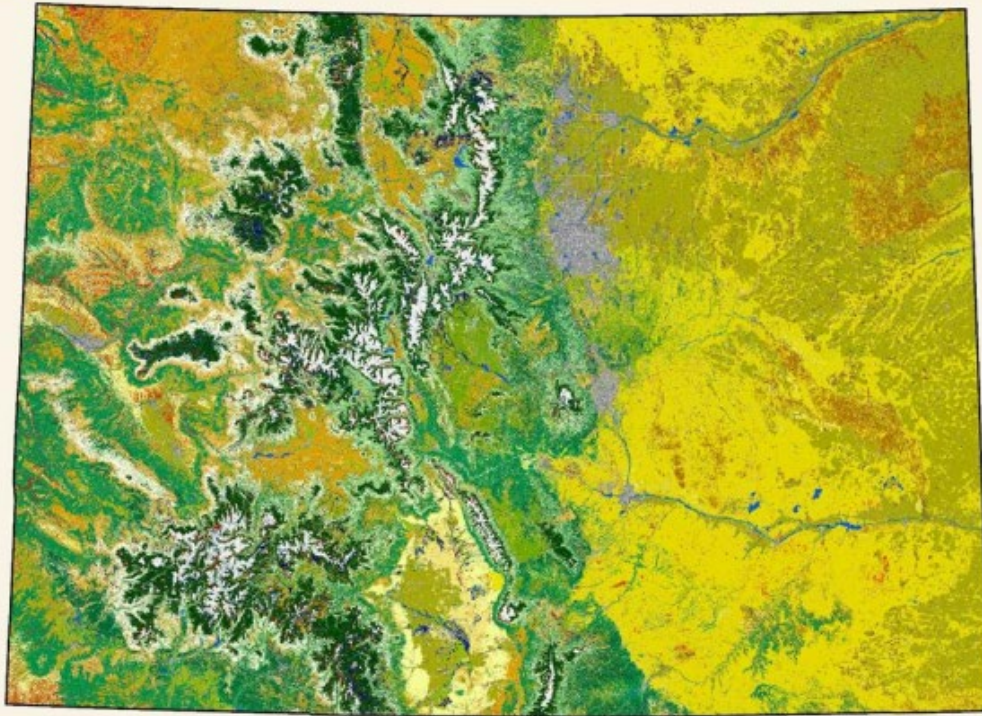
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Rare Plants in the 2025 SWAP

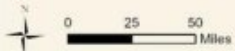
290 Species Evaluated
64 Tier 1, 69 Tier 2, 62 SGIN (195 total)



Element 2: Habitats



Habitat Classes



Habitat Process

Habitat List

- Think of as “land cover”
- Based on LANDFIRE data
- New for 2025- Barrens layer (tailored to plants)

Assigning Habitats to Species

- Informed by land cover of known occurrences + primary literature + expert opinion
- Allows for multiple primary and secondary habitat types per species



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Important habitat types for rare plants



- Barrens, pinyon-juniper, desert shrub & sagebrush are the top 4 most important types
- Cliffs, canyons & alpine are close runner-ups

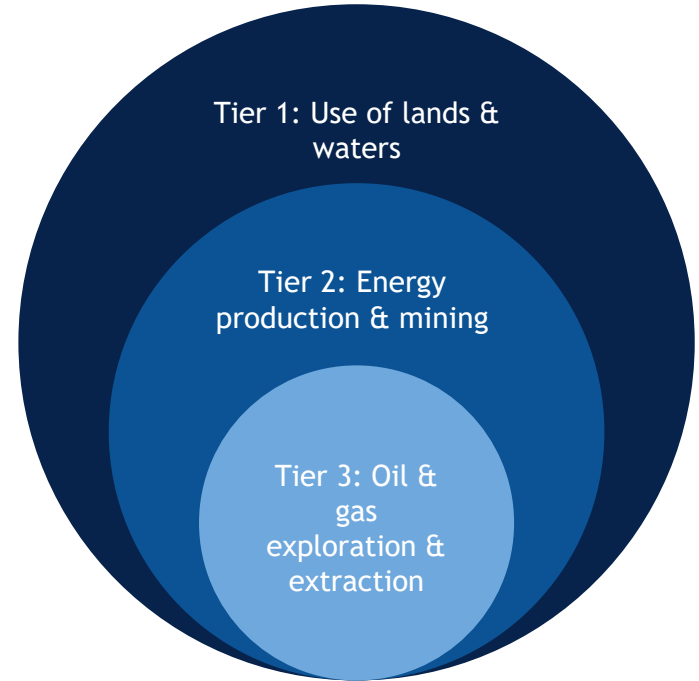


Element 3: Threats



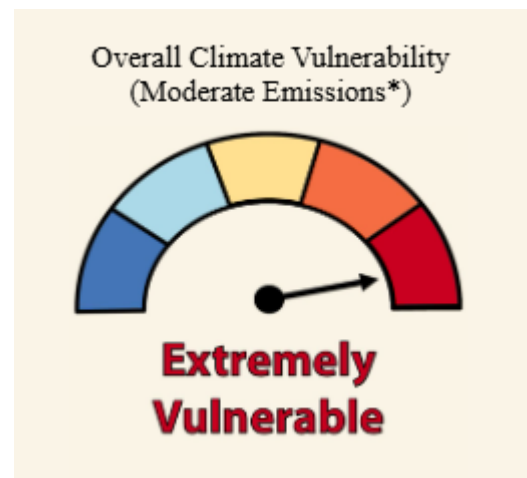
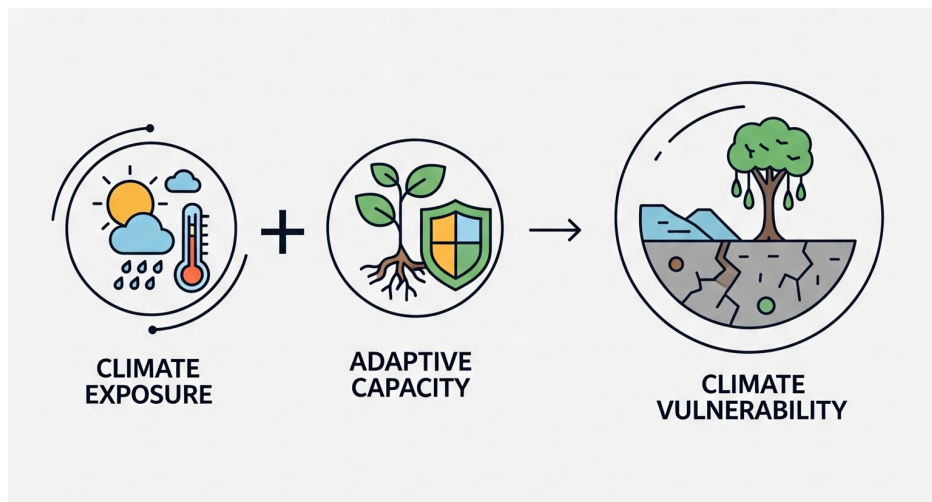
Threats Process: Non-climate threats

- Pulled from CNHP element occurrence data
- Classified based on NatureServe lexicon
- Scope and severity of threats evaluated



Threat Process: Climate Threats

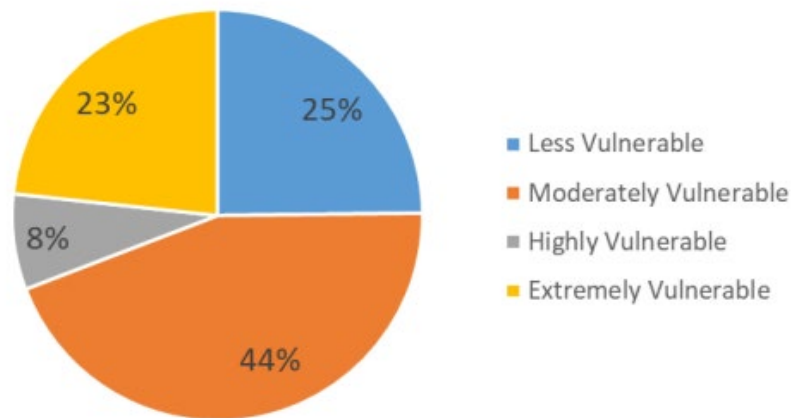
Utilized NatureServe Climate Change Vulnerability Index (CCVI) 4.0



Threats: Results

- Recreation, invasive species, and improper grazing are some of the most ubiquitous (but not necessarily most severe) threats
- Climate vulnerability higher for plants than wildlife

Climate Vulnerability of Tier 1 and 2 SGCN Plants
Under Moderate (RCP 4.5) Emissions Scenario



Elements 4 & 5: Actions & Monitoring



Actions & Monitoring Process

- Feedback requested:
 - Existing conservation plans
 - Existing monitoring
 - Existing actions
 - Potential short-term actions
 - Potential long-term actions
- Responses coded into standard lexicon (CMP Actions Classification 2.0)



Action & Monitoring: Takeaways

- Prioritize broad-scale actions that benefit many species at once
- Conduct basic research and monitoring to understand species needs
- Develop site-specific actions by assessing on-the-ground conditions
- Build strong partnerships across agencies for success



Next Steps

- Develop digital tools to track implementation
- Build SWAP related requirements into funding opportunities and other planning efforts
- Use SWAP to guide monitoring and conservation actions
 - Which species would benefit most from trend monitoring?
 - Which species need seed banking?
 - Which species are most impacted by energy development?



Acknowledgements

- Colorado Parks & Wildlife (CPW) Core: Kacie Miller, Catherine Adams, Angela Boag, Jenn Logan, David Klute, Kacie Miller, Dan Neubaum, Liza Rossi, Hayley Schroeder, Amy Seglund, Ben Wasserstein, Boyd Wright
- Colorado Natural Heritage Program (CNHP): Lee Grunau, Jessica Smith, Jill Handwerk
- Plants- SGCN scoring, threats assessment & action planning
Mark Beardsley (EcoMetrics, LLC), Georgia Boyle (CNHP), Carol Dawson (Bureau of Land Management), Michelle DePrenger-Levin (Denver Botanic Gardens), Jake Gottschalk (U.S. Fish & Wildlife Service), Jill Handwerk (CNHP), David Hirt (Boulder County Parks & Open Space), Mike Kirkpatrick (U.S. Forest Service), Phil Krening (Bureau of Land Management), My-Lan Le (Denver Botanic Gardens), Ross McCauley (Fort Lewis College), Susan Panjabi (CNHP), Lynn Riedel (City of Boulder Open Space and Mountain Parks), Alex Seglias (Denver Botanic Gardens), Jessica Smith (CNHP), Savanna Smith (CNHP/CPW), Crystal Strouse (City of Fort Collins Natural Areas), Raquel Wertsbaugh



Data Hub Walkthrough



Colorado's 2025 State Wildlife Action Plan Species of Greatest Conservation Need (SGCN) & Habitats Data Hub



Welcome to Colorado's 2025 State Wildlife Action Plan (SWAP) Data Hub!

To learn how to effectively navigate and utilize this dashboard, please review our [Data Hub Walk-through Video](#).

As the central part of our “digital SWAP”, the Data Hub contains information about Species of Greatest Conservation Need (SGCN) and their habitats.

You can explore species and habitat profiles, threats affecting these resources, and existing plans and monitoring efforts. You will also find prospective short and long-term conservation actions that may be implemented during the 10-year timeframe of the SWAP.

Please note that invertebrate SGCN species are not yet incorporated into Colorado's 2025 SWAP Data Hub. These species as well as the vertebrate and plant Species of Greatest Information Need (SGIN) subset of SGCN are listed in the “All Species Ranking Dashboard”.

This Hub was created through a collaborative planning process. Visit [EngageCPW](#) to learn more about the process as well as find additional information on broader threats and actions not specific to an individual SGCN or habitat.

This site is for anyone - biologists, researchers, educators, conservation planners, organizations, individuals - who want to better understand and support the conservation of SGCN and their habitats.

Explore SGCN Species

Explore Habitats

Investigate Threats/Actions

Threats/Actions
Quick Summary

All Species SWAP Rankings



Full screen mode

Last dashboard update: September 12th, 2025

View Photo Credits



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<https://engagecpw.org/state-wildlife-action-plan>



Taxonomic Group

Explore Species

Species



Plants

Fiddleleaf Twinpod (*Physaria vitulifera*)

Fiddleleaf Twinpod

Physaria vitulifera

SGCN Tier 2

Not Listed



Species Summary

Threats

Climate Change Vulnerability

Actions & Monitoring



+ Enlarge photo

Photo credit/org.: Raquel Wertzbaugh / CPW

All Habitat Usage Type(s)

Habitat Usage Type:

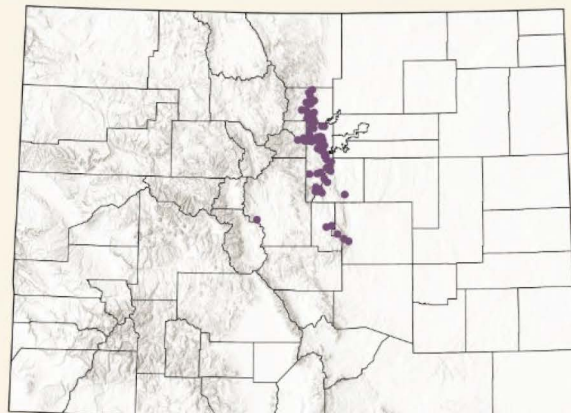
Click a habitat to open its summary page in a new window

Primary	Foothill & Mountain Grasslands
	Lower Montane-Foothill Shrublands
	Ponderosa Pine
Other	Dry-Mesic Mixed Conifer

+ Enlarge Associated Habitats

Maps depict where the species could occur.

Interactive maps with metadata will be available via [CODEX](#) in September 2025.



Physaria vitulifera

Counties

Known Distribution

0 25 50 Miles



Data Sources: U.S. Geological Survey (USGS) and Colorado Parks and Wildlife (CPW), Colorado Natural Heritage Program (CNHP), June 2025

+ Enlarge species range map

[View in the Colorado Rare Plant Guide](#)



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Explore Species

Taxonomic Group: Plants Species: Fiddleleaf Twinpod (*Physaria vitulifera*)

Fiddleleaf Twinpod
Physaria vitulifera
 SGCN Tier 2
 Not Listed



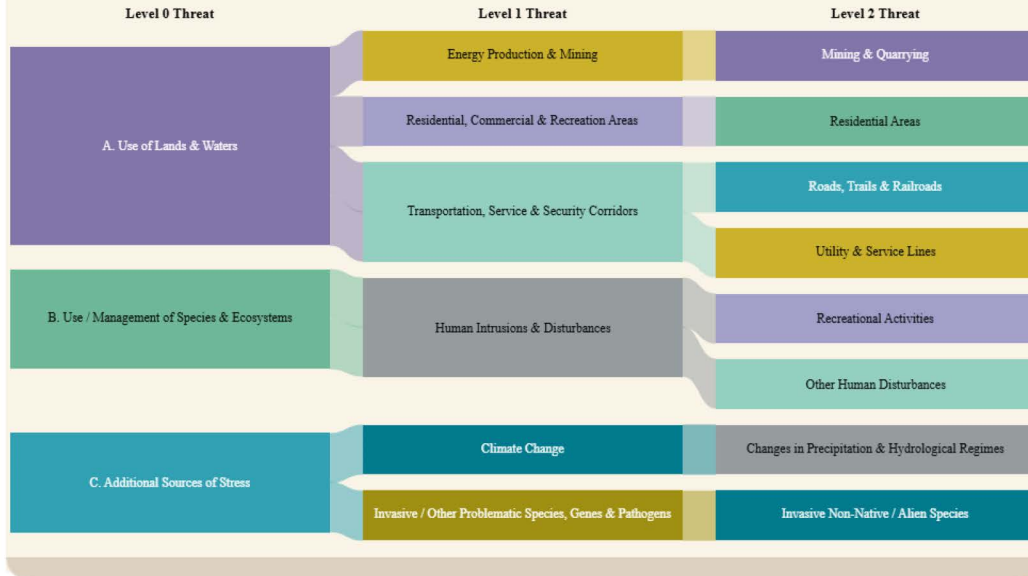
Species Summary | **Threats** | Climate Change Vulnerability | Actions & Monitoring

International Union for Conservation of Nature (IUCN)-Conservation Measures Partnership (CMP) Threats

[View Threats Background Info](#)

View all IUCN-CMP threats for the selected species in the sankey chart below; hover over paths in the chart to view threat details. Alternatively, you may use the button to the right to view threats in tabular format. For detailed methods and results summarized across taxa and habitats, see "Element 3: Threats" on [EngageCPW](#).

[View Threats Details in a Table](#)





Species Summary

Threats

Climate Change Vulnerability

Actions & Monitoring

NatureServe Climate Change Vulnerability Index (CCVI) ?

CCVI is a tool for evaluating the relative climate change vulnerability of a species by assessing climate exposure and adaptive capacity.

Overall Climate Vulnerability
(Moderate Emissions*)

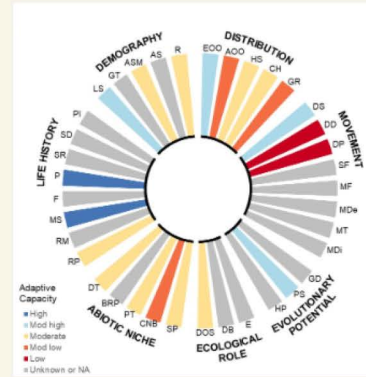


Overall Climate Vulnerability
(High Emissions*)



Adaptive Capacity Wheel ?

Adaptive Capacity: Moderately Low



CCVI Assessment Notes:

Physaria vitulifera is expected to experience moderate to high exposure to climate change under moderate and high emissions scenarios, respectively; it has moderately low adaptive capacity and is Moderately Vulnerable under both scenarios. Limited dispersal ability reduces adaptive capacity. Anthropogenic and topographic barriers to movement may influence vulnerability. Reproduction through cross pollination and multiple reproductive cycles per lifetime provide opportunities for adaptation.

Climate Exposure ?

Moderate Emissions*:

Moderate

High Emissions*:

High

To view detailed input and output data related to the Climate Change Vulnerability Index (CCVI) assessment for this and other species, see [CCVI Results T1 and T2 SGCN](#). For detailed CCVI methods and results summarized across taxa, see "Element 3: Threats" on [EngageCPW](#).

Explore Species

Taxonomic Group: Plants Species: Fiddleleaf Twinpod (*Physaria vitulifera*)

Fiddleleaf Twinpod
Physaria vitulifera
 SGCN Tier 2
 Not Listed



Species Summary Threats Climate Change Vulnerability **Actions & Monitoring**

Actions and Monitoring

The planning teams collected a wealth of information regarding monitoring and actions through meetings; and targeted questions to elicit salient responses from experts about their knowledge of current efforts and vision for future actions.

The [CMP Actions Classification 2.0](#) lexicon was used to code responses about prospective actions, as summarized along with any meaningful details in the tables below.

If codes 6.4, 8.1, and 10.3 are selected with no details provided assume this is an indication of support for continuing to implement the plans, monitoring and other actions identified under "Existing Actions".

For detailed methods and results summarized across taxa and habitats, additional proposed actions not specific to a species or habitats, and more on SWAP implementation and monitoring, see "Elements 4 & 5" on EngageCPW.

Prospective Short and Long Term Actions

Time Frame: Short Term



Actions



Action Details

6. Conservation Designation & Planning

6.4. Conservation Planning

Evaluate the adequacy of existing conservation measures within local government management plans.

10. Institutional Development

10.3. Alliance & Partnership Development

Conduct field surveys to confirm species presence, assess current conditions and threats, and identify management concerns, especially at historical locations.

Ensure existing Best Management Practices for invasive plant species management in natural areas are up to date and utilized by land managers

Existing Actions



Recovery and Management Plans

None



Monitoring and Actions

The species receives periodic updates to statewide element occurrence data from CNHP or other partners. Opportunistic sightings are recorded in iNaturalist and herbarium databases. No consistent trend monitoring occurs.





You've navigated to this dashboard through a habitat-specific link.



[Click here to explore other habitats](#)

Lower Montane-Foothill Shrublands

Shrubland Habitats



Habitat Summary

Threats

Actions & Monitoring



Photo credit/org.: Raquel Wertzbaugh / CPIW

[+ Enlarge photo](#)

Supported SGCN Species (as primary habitat)

[Click a species to open its summary page in a new window](#)

Habitat Usage Type:

Primary

Species count:

12

Bell's Twinpod (*Physaria bellii*) SGCN Tier 1

Big Brown Bat (*Eptesicus fuscus*) SGCN Tier 2

Fiddleleaf Twinpod (*Physaria vitalifera*) SGCN Tier 2

Gray Wolf (*Canis lupus*) SGCN Tier 1

Gunnison's Prairie Dog (*Cynomys gunnisoni*) SGCN Tier 1

[+ Enlarge SGCN Supported Species](#)

Interactive maps with metadata will be available via [CODEX](#) in September 2025.

[LANDFIRE](#) was used to categorize and map terrestrial habitats.

This [crosswalk](#) depicts which LANDFIRE vegetation cover categories were rolled up into SWAP Habitats and other sources of mapping data.

Vegetation cover types are [described](#) by NatureServe.



Lower Montane-Foothill Shrublands

Legend: Mapped Distribution (green), Counties (black outline)

Scale: 0, 20, 40 Miles

Data Sources: Esri, LANDFIRE, 2023, Existing Vegetation Type, LANDFIRE 2.0.0, U.S. Department of the Interior, Geological Survey, and U.S. Department of Agriculture, Colorado Natural Heritage Program (CNHP), June 2021

[+ Enlarge range map](#)



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Investigate Threats & Actions Dashboard



View IUCN-CMP Threats or Actions:

Level 0 Action

Level 1 Action

Level 2 Action

A. Target Restoration/Stress ...

(All)

(All)

Affected Species

Open/Close Associated Habitats

- Black Canyon Gillia (*Aliciella penstemonoides*)
- Brandege Wild Buckwheat (*Eriogonum brandegeei*)
- Canyonlands Aletes (*Lomatium latilobum*)
- Cathedral Bluff Dwarf Gentian (*Gentianella tortuosa*)
- Chapin Mesa Milkvetch (*Astragalus schmollii*)
- Clay-loving Wild Buckwheat (*Eriogonum ...*)

Affected Habitats

Open/Close Associated Species

Level 0 Action

Level 1 Action

Level 2 Action



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Threats/Actions Quick Summary

Unique Species: 133

Taxonomic Group or Major Habitat

Unique Species or Habitat



- Threats
- Actions



Click threats/action names or bar chart elements to view counts of affected species and/or habitats (or use CTRL+Click to select multiples).
 Hover your mouse over bar chart elements to view specific affected species and habitats for a particular threat or action.

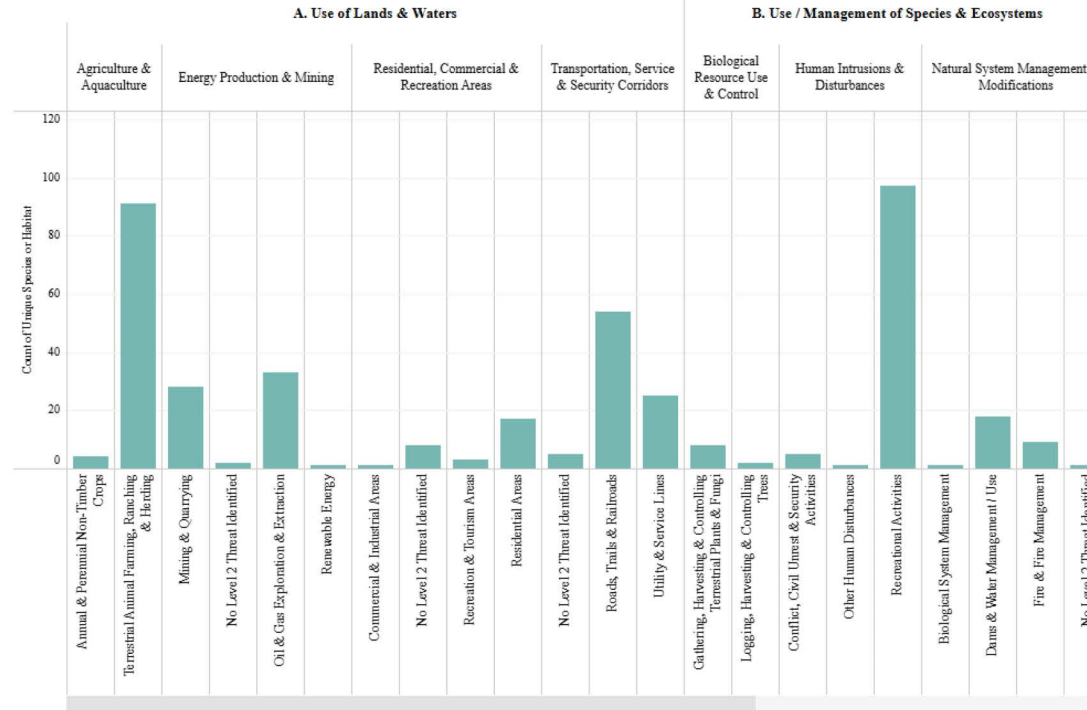
Unique Habitats: 0

Plants

(All)

Species

Level 0 Threat / Level 1 Threat / Level 2 Threat



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Thank you!

Learn more at:

<https://engagecpw.org/state-wildlife-action-plan>

Contact me at:

[**savanna.smith@state.co.us**](mailto:savanna.smith@state.co.us)

