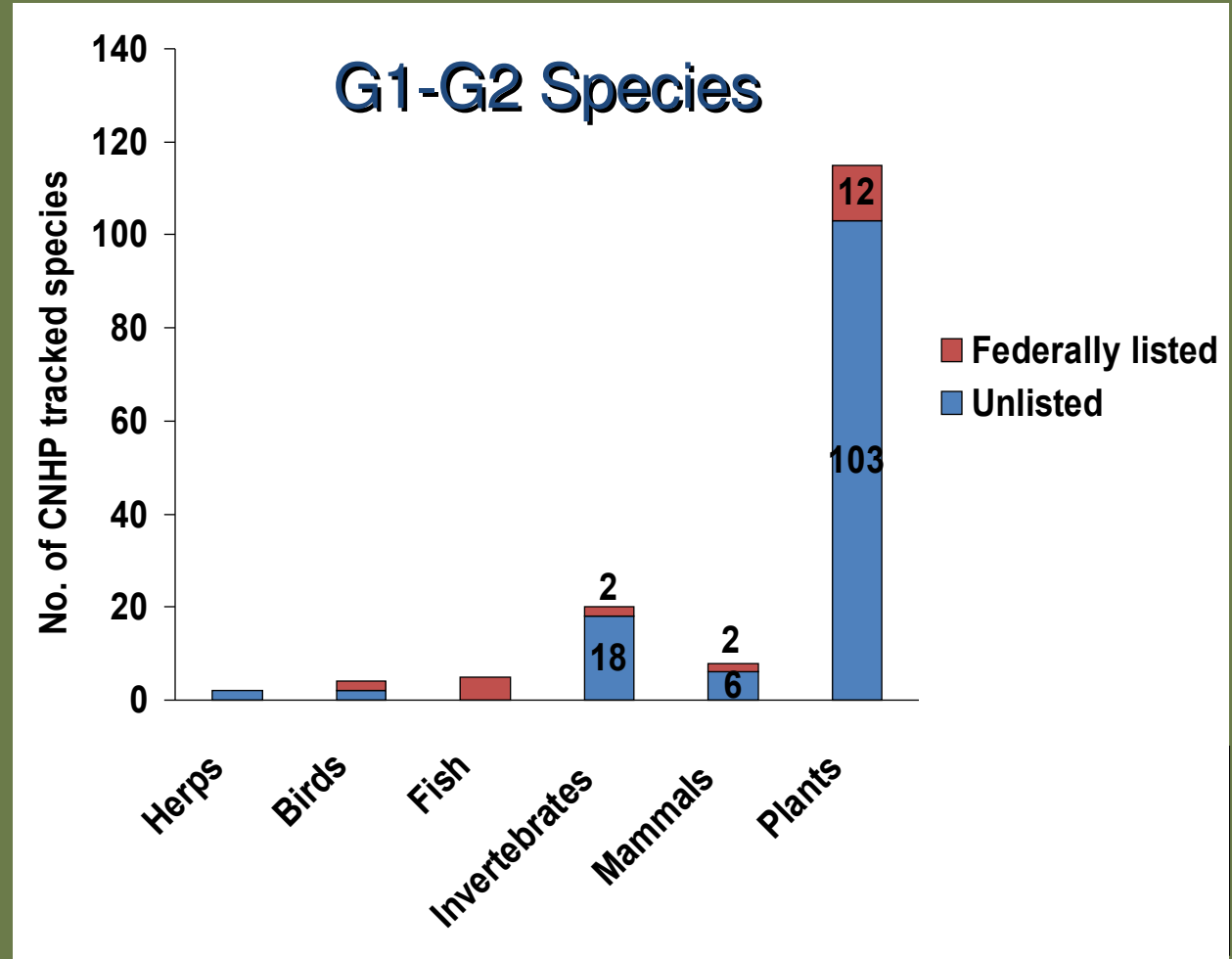
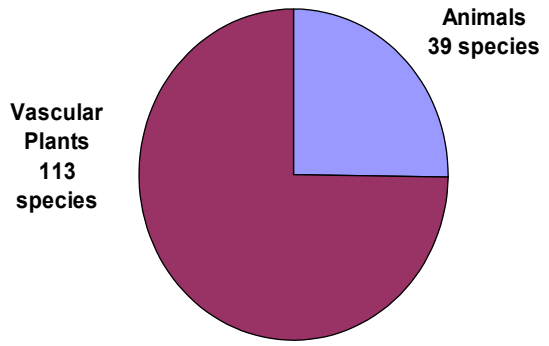




The Forgotten Majority: 75% of CO's Imperiled Species are Plants

Number of Imperiled Species in Colorado





**RECOMMENDED BEST MANAGEMENT
PRACTICES
FOR PLANTS OF CONCERN**

Practices Developed to Reduce the Impacts
of
Oil and Gas Development Activities
to Plants of Concern

Prepared by the
Colorado Rare Plant Conservation Initiative

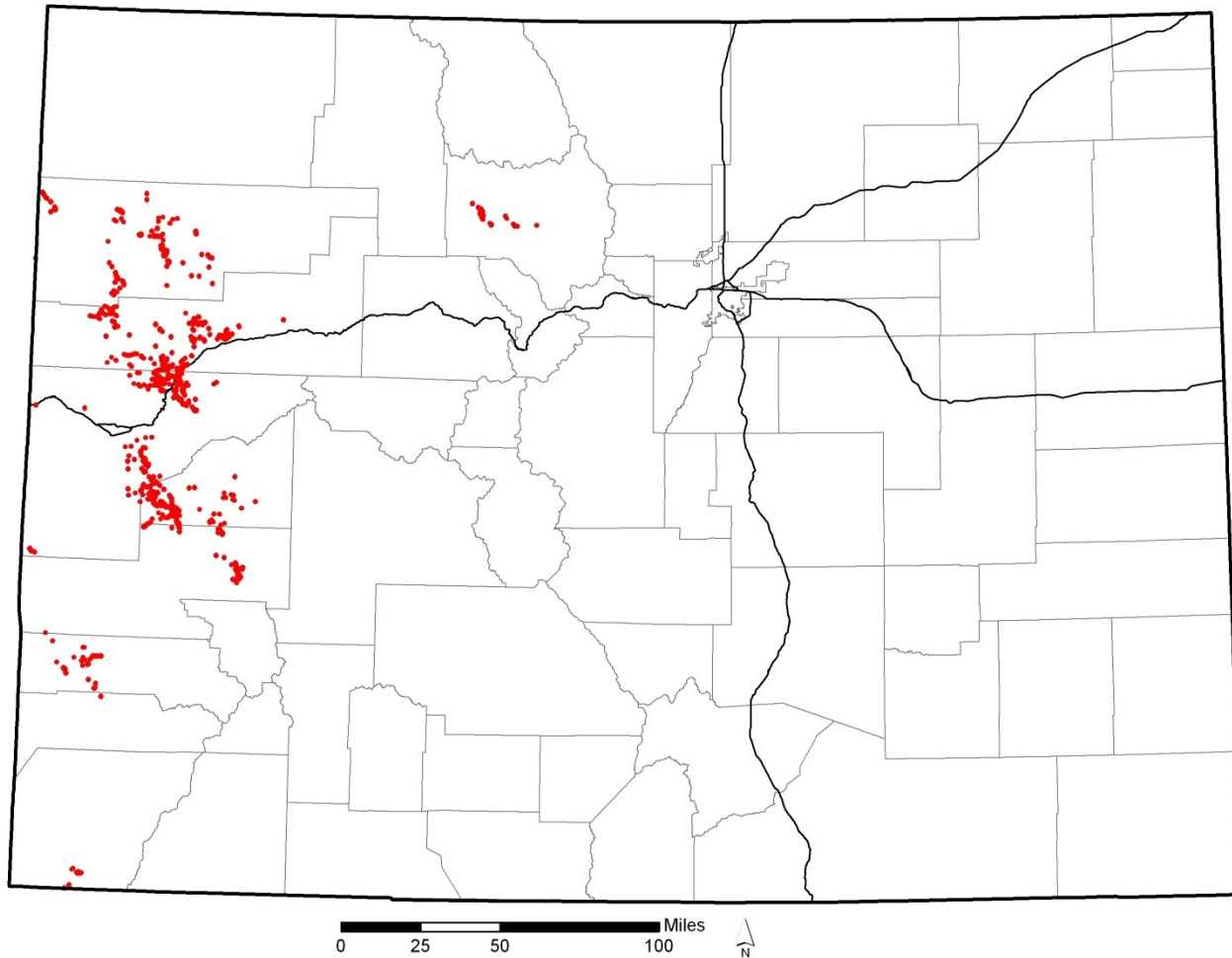
Brian Kurzel, Colorado Natural Areas Program





Scientific name	Rank (CNHP 2008)	Federal Status	Endemic to Colorado	Occupied acres in Colorado	Habitat
	G1/S1	LE	No	1,433	Cliff and canyon
	G2/S2	BLM	Yes	106	Pinyon-juniper
	G1/S1	LE	Yes	793	Shrubland
	G1G2/S1S2	BLM (proposed)	Yes	525	Pinyon-juniper
	G2/S1	none	No	4	Shrubland
	G2/S2	LE	Yes	1,178	Shrubland
	G1/S1	LT	Yes	740	Barrens
	G2/S2	BLM	Yes	3,272	Barrens
	G2/S2	BLM	Yes	4,547	Barrens
	G1/S1	C	Yes	60	Barrens
			Yes	3,416	Shrubland
<i>glabrescens</i>	G3T2/S2	none			
<i>Penstemon grahamii</i>	G2/S1	BLM	No	639	Barrens
<i>Penstemon scariosus</i> var. <i>albifluvis</i>	G4T1/S1	C	Yes	124	Barrens
<i>Phacelia submutica</i>	G2T2/S2	C, FS	Yes	586	Barrens
<i>Physaria obcordata</i>	G1G2/S1S2	LT	Yes	473	Barrens
<i>Sclerocactus glaucus</i>	G3/S3	LT	Yes	10,203	Barrens
		BLM	Yes	457	Barrens
<i>Thalictrum heliophilum</i>	G2/S2	(proposed)			
Total Acres				28,556	

Most Imperiled Plants in Oil and Gas Development Areas



Occupied habitat for the seventeen plants of concern. Total occupied acreage is less than 30,000 acres (Colorado Natural Heritage Program 2008). Red dots increased in size for visibility

Recommended BMPs for Plants of Concern



Goals

- Conserve/protect imperiled plants and their habitat
- ***Increase awareness*** and prevent unintended harm to imperiled plant species
- Decrease need for listing under ESA; recover listed species

Recommended BMPs for Plants of Concern

Sources



- Formal compilation of the best recommended practices for protection of rare plants from:
 - BLM, USFWS, USFS, Consulting firms, non-profits such as the CA Native Plant Society
- Other sources also exist:
 - BLM's Record of Decision for the National Vegetation Treatments Final Programmatic

Recommended BMPs for Plants of Concern

Organized By:

- Project Planning
- Pre-Ground Disturbance
- Project Implementation
- Management of Weeds and Revegetation
- Post-Project Monitoring



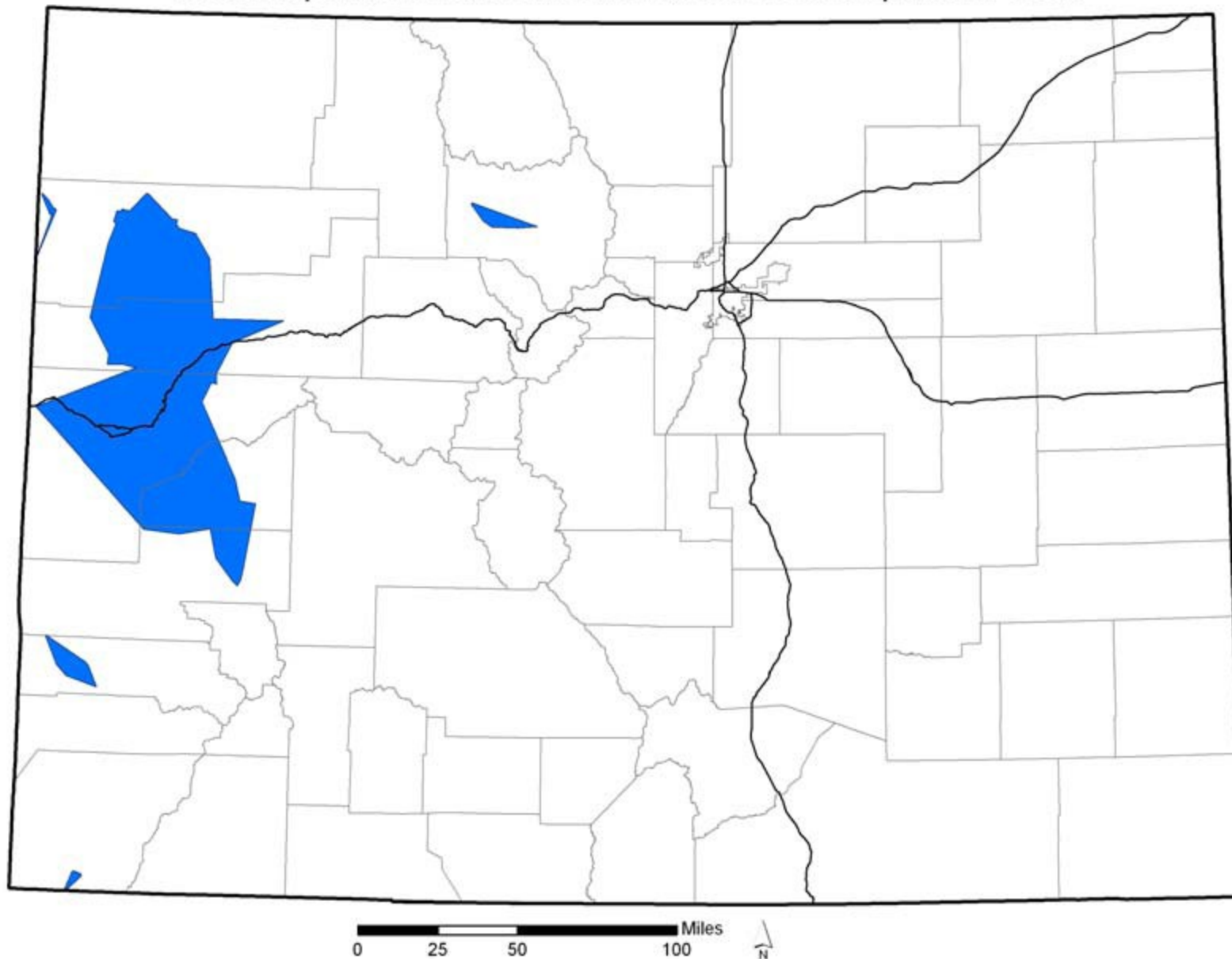


Recommended BMPs for Plants of Concern

Project Planning:

- Gather mapped rare plant locations
- Consult with USFWS regarding any listed species, and to discuss candidates or proposed species
- Implement avoidance buffer of 200 meters
- Begin planning for:
 - rare plant survey, reveg, weed mgmt and monitoring

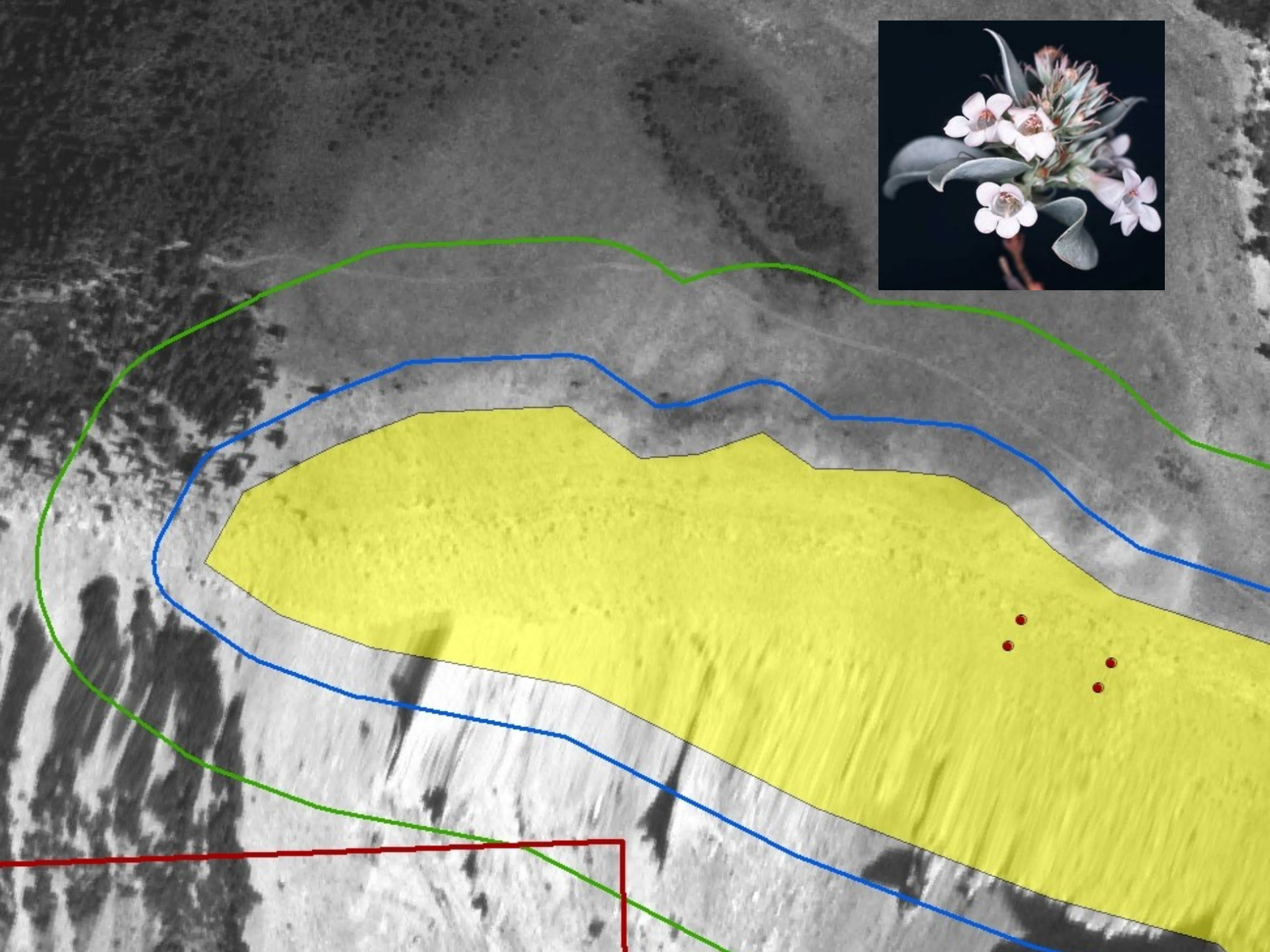
Recommend Survey Areas for the Most Imperiled Plants in Oil and Gas Development Areas



Recommended BMPs for Plants of Concern

Project Planning:

- Gather mapped rare plant locations
- Consult with USFWS regarding any listed species, and to discuss candidates or proposed species
- Implement avoidance buffer of 200 meters
- Begin planning for:
 - rare plant survey, reveg, weed mgmt and monitoring
- Plan to reduce the footprint of the project as



Recommended BMPs for Plants of Concern

Pre-Ground Disturbance:

- Conduct rare plant surveys in project area
 - Including a 200 meter buffer





Recommended BMPs for Plants of Concern

Pre-Ground Disturbance:

- Conduct rare plant surveys in project area
 - Including a 200 meter buffer
- Map and treat noxious weed species
- Erect fencing/signage around project footprint
- Communicate rare plant protections to field staff





Recommended BMPs for Plants of Concern

Project Implementation:

- Implement all planning to reduce footprint
- Control erosion/runoff
- Stockpile topsoil for use in final reclamation





Recommended BMPs for Plants of Concern

Project Implementation:

- Implement all planning to reduce footprint
- Control erosion/runoff
- Stockpile topsoil for use in final reclamation
- Reduce fugitive dust
 - Recommend gravel roads or water
- Minimize spread of noxious weeds



Recommended BMPs for Plants of Concern

Management of Invasives and Revegetation:



- Treat noxious weeds in project area
 - Keep herbicide >200m from rare plant occurrences unless weeds are threatening plants
 - Hand-spraying
- Reclaim disturbed areas to the smallest area possible
 - Decompacting, recontouring and erosion control
 - Use local, native species
 - Certified weed-free mulch

Recommended BMPs for Plants of Concern

Post-Project Monitoring:

- Noxious weeds
- Revegetation
- Monitor *rare plants* to detect potential changes resulting from development



Resources



- www.oilandgasbmps.org/viewpub.php?id=17
(Rare Plant BMP Text)
- www.oilandgasbmps.org/resources/vegetation.php
(general vegetation information)
- parks.state.co.us/NaturalResources/CNAP/Publications/
(state partner to provide BMP info)
- www.cnhp.colostate.edu
(rare plant mapping/surveys)

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**Prepared by the Colorado Rare Plant
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