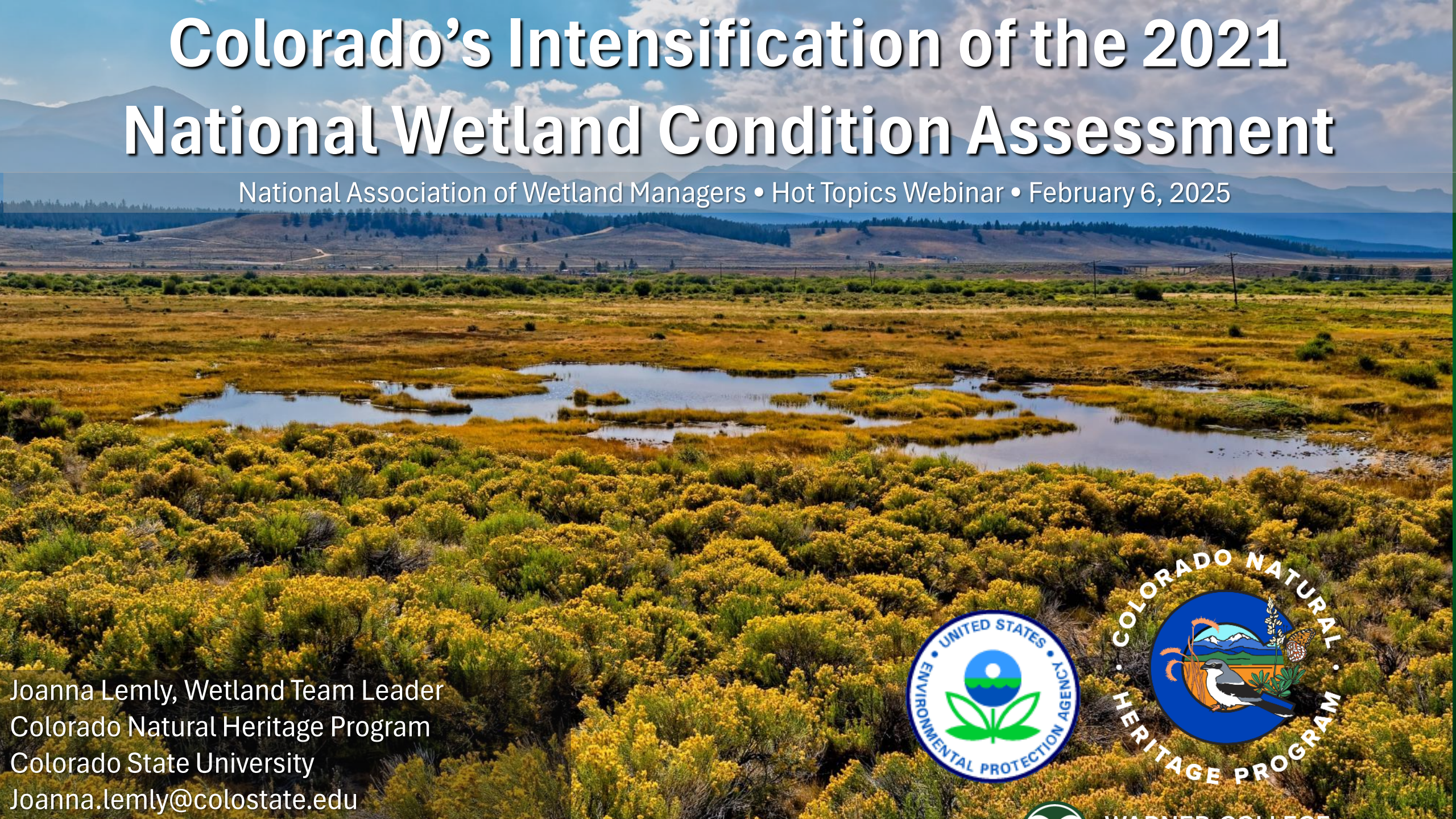
Colorado's Intensification of the 2021 National Wetland Condition Assessment

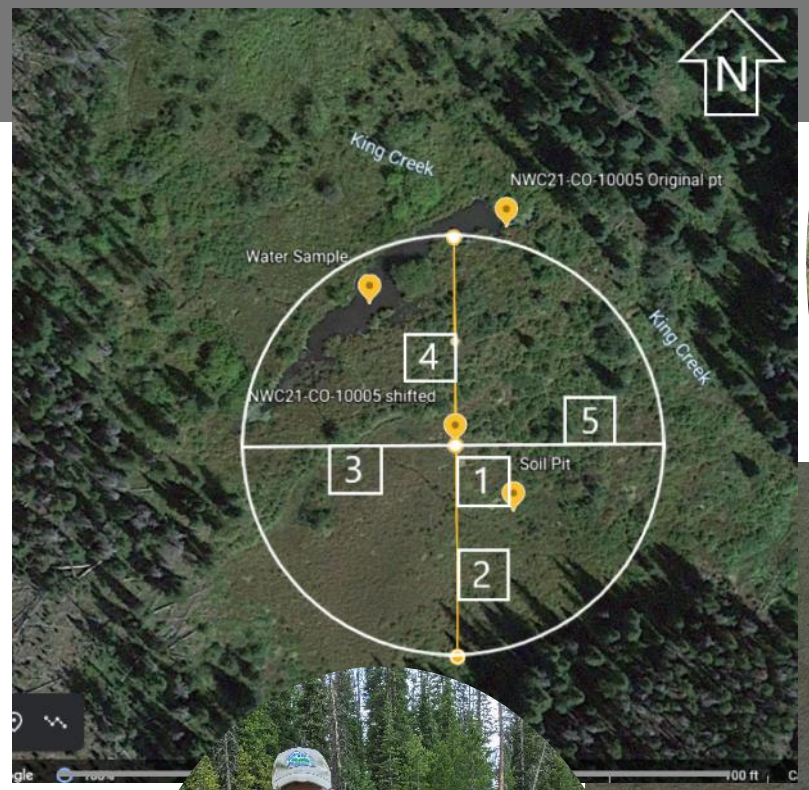
National Association of Wetland Managers • Hot Topics Webinar • February 6, 2025



Joanna Lemly, Wetland Team Leader
Colorado Natural Heritage Program
Colorado State University
Joanna.lemly@colostate.edu

Presentation Roadmap

1. *Background on CNHP and our involvement with NWCA*
2. *Overview of Colorado wetlands*
3. *Sample design for the Colorado intensification of NWCA*
4. *Characteristics of Colorado NWCA sites*
5. *Results: Vegetation condition*
6. *Results: Physical alterations, water quality*
7. *Comparison of NWCA and BLM R&W AIM*
8. *Conclusions on 2021 NWCA sampling*
9. *Benefits and considerations of NWCA*



Colorado Natural Heritage Program: Who We Are

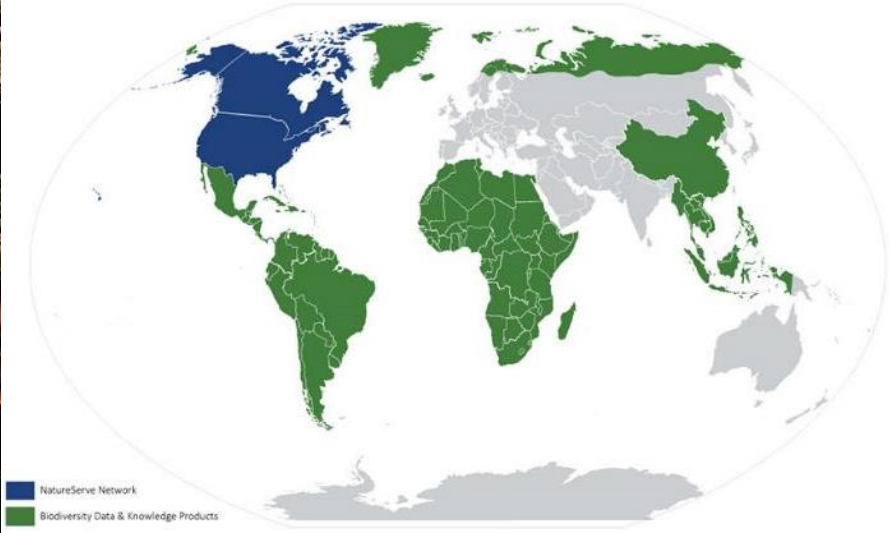
Colorado Natural Heritage Program is both:

1. A research and service department of CSU's Warner College of Natural Resources
2. A constituent member of the NatureServe Network

COLORADO NATURAL HERITAGE PROGRAM

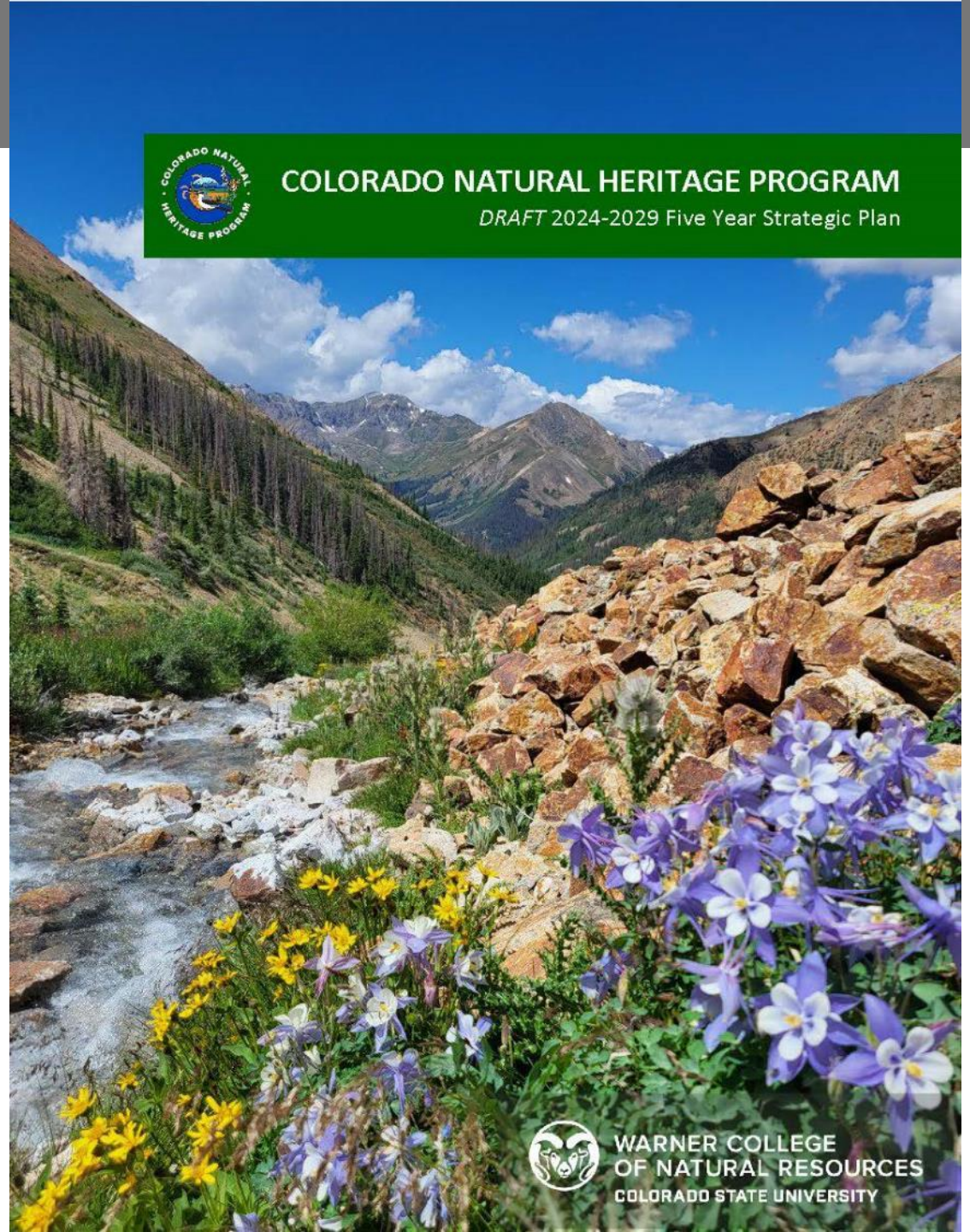
WARNER COLLEGE OF NATURAL RESOURCES
COLORADO STATE UNIVERSITY

NATURESERVE NETWORK



Mission Statement

We advance the conservation of native species and ecosystems through science, planning, and education for the benefit of current and future generations.



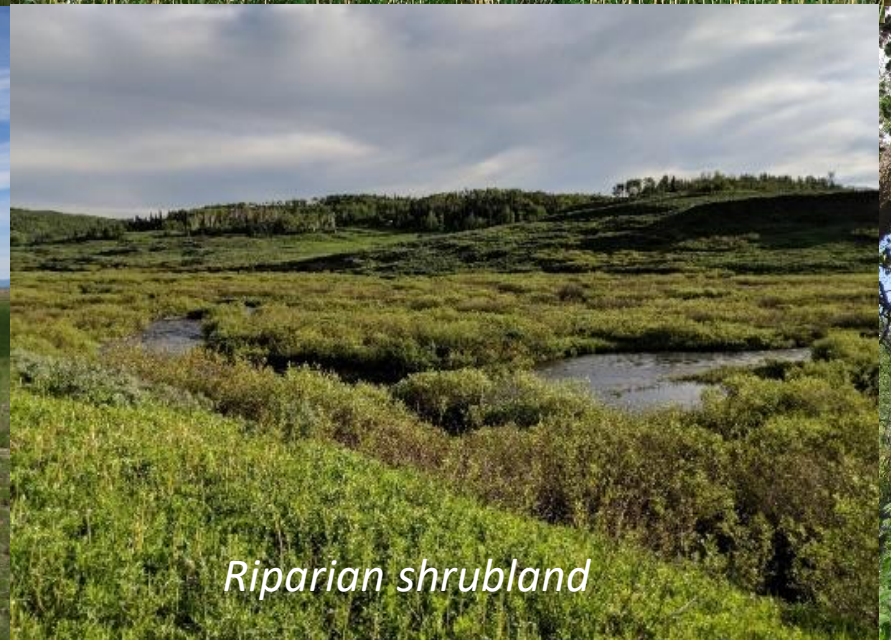
CNHP Wetland Assessment & NWCA

- *Historically, no wetland program within CDPHE, the Colorado water quality agency. CNHP filled the gap.*
- ***2008:** CNHP began assessing the condition of Colorado wetlands through river basin studies*
- ***2009:** CNHP was an early partner in the development and testing of NWCA methods.*
- ***2011:** CNHP carried out probabilistic sampling in CO (12 sites) and WY (9 sites), and reference site sampling in CO, WY and UT (6 sites).*
- ***2016:** CNHP carried out probabilistic sampling in CO (26 sites) through contract with CDPHE.*
- ***2021:** CNHP carried out base probabilistic sampling in CO (22 sites) and WY (19 sites), additional WPDG-funded CO intensification (28 sites).*
- ***2024:** Colorado passed HB 24-1379 for CDPHE to regulate dredge & fill in Colorado State Waters.*

For more information about CNHP's wetland work: https://cnhp.colostate.edu/cwic/

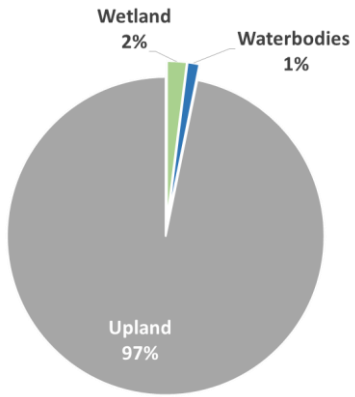
COLORADO
Department of Public Health & Environment

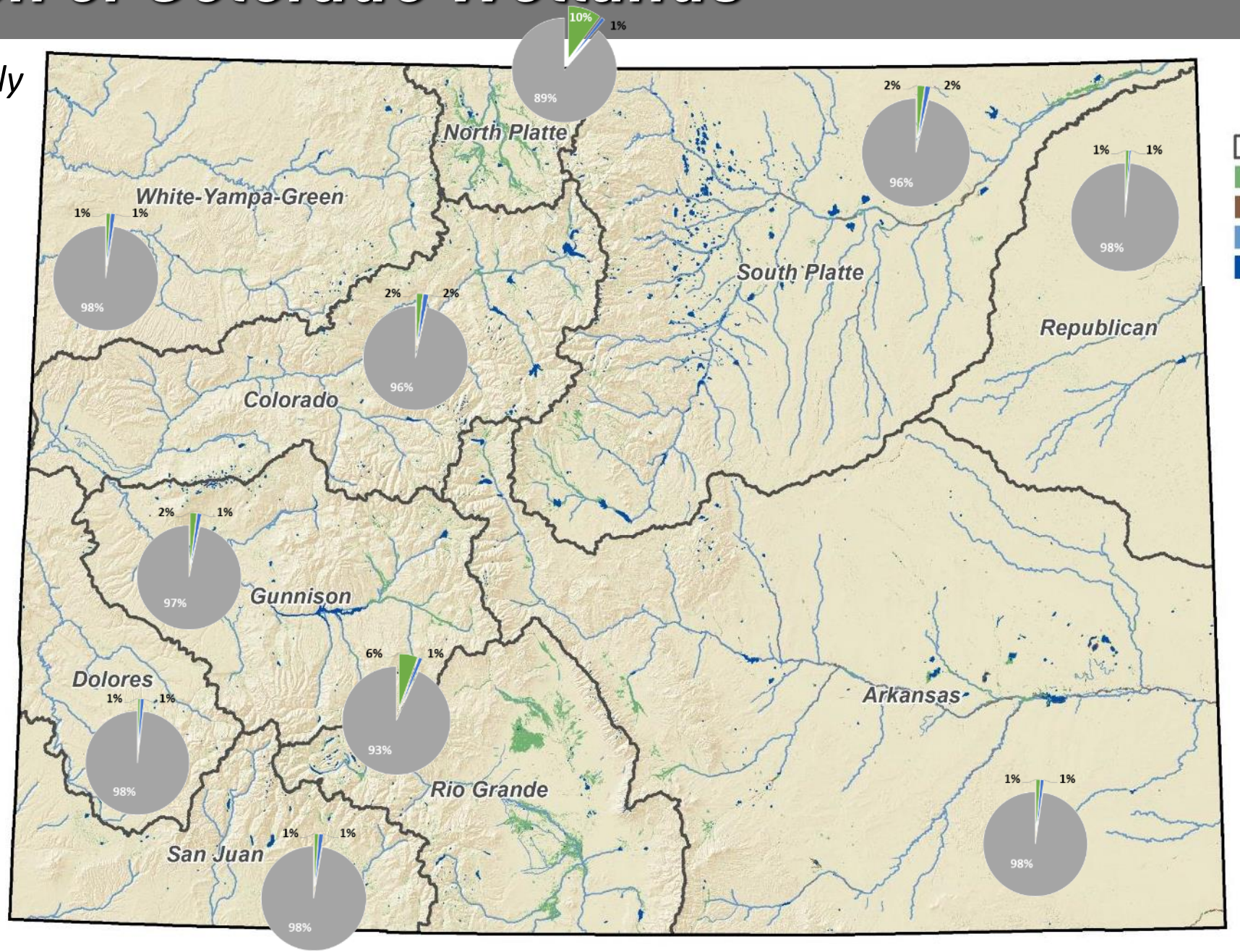
Colorado Wetland Types



Distribution of Colorado Wetlands

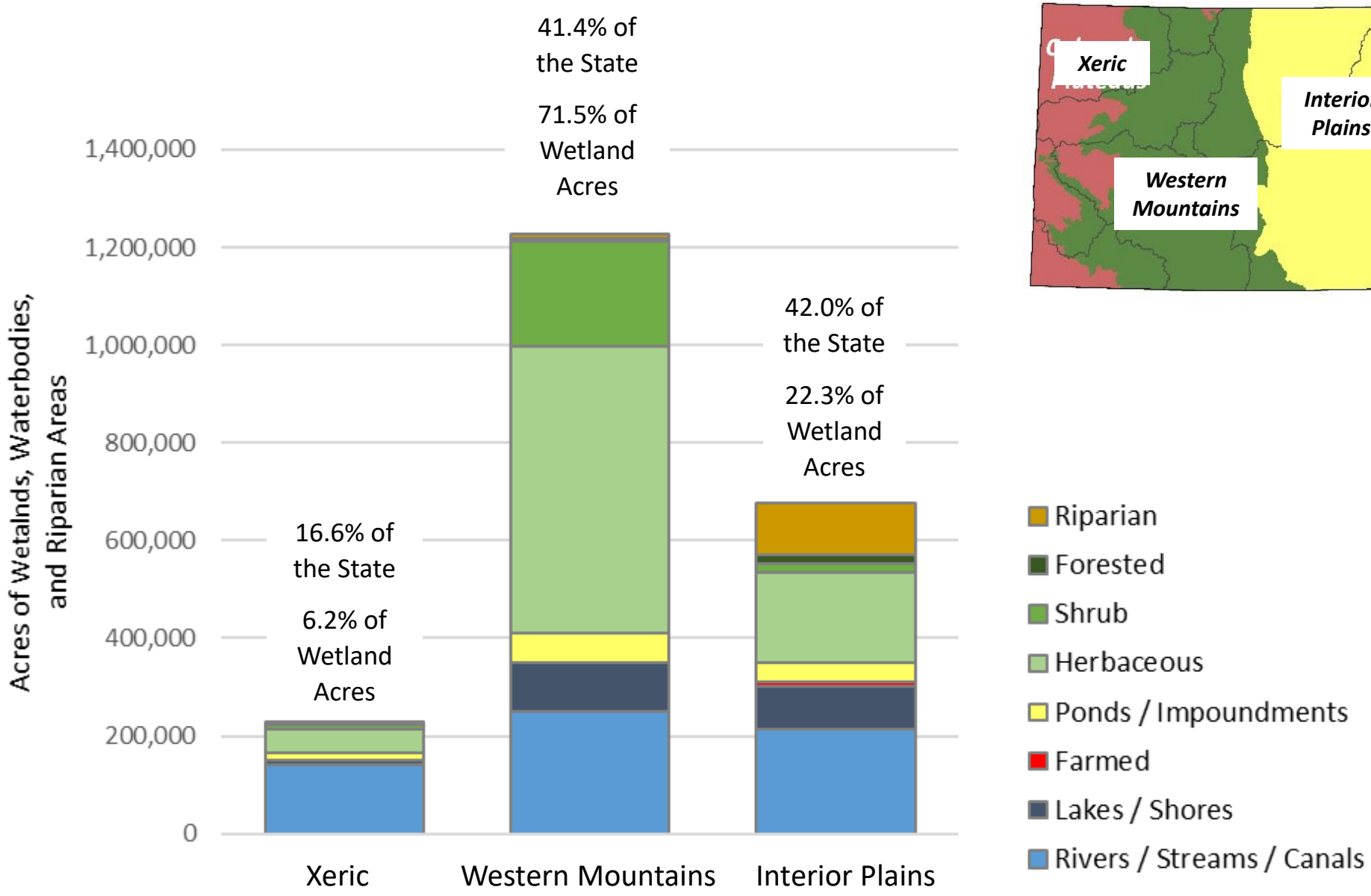
- *Wetlands cover only 2% of Colorado's land area.*
- *Distribution varies by river basin.*
- *Estimated loss: 50% original area.*

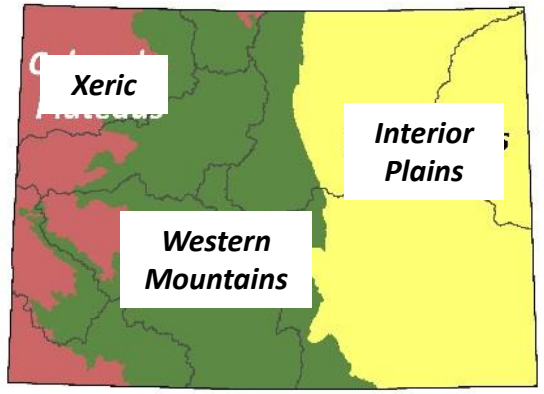




Wetland Types by Ecoregion

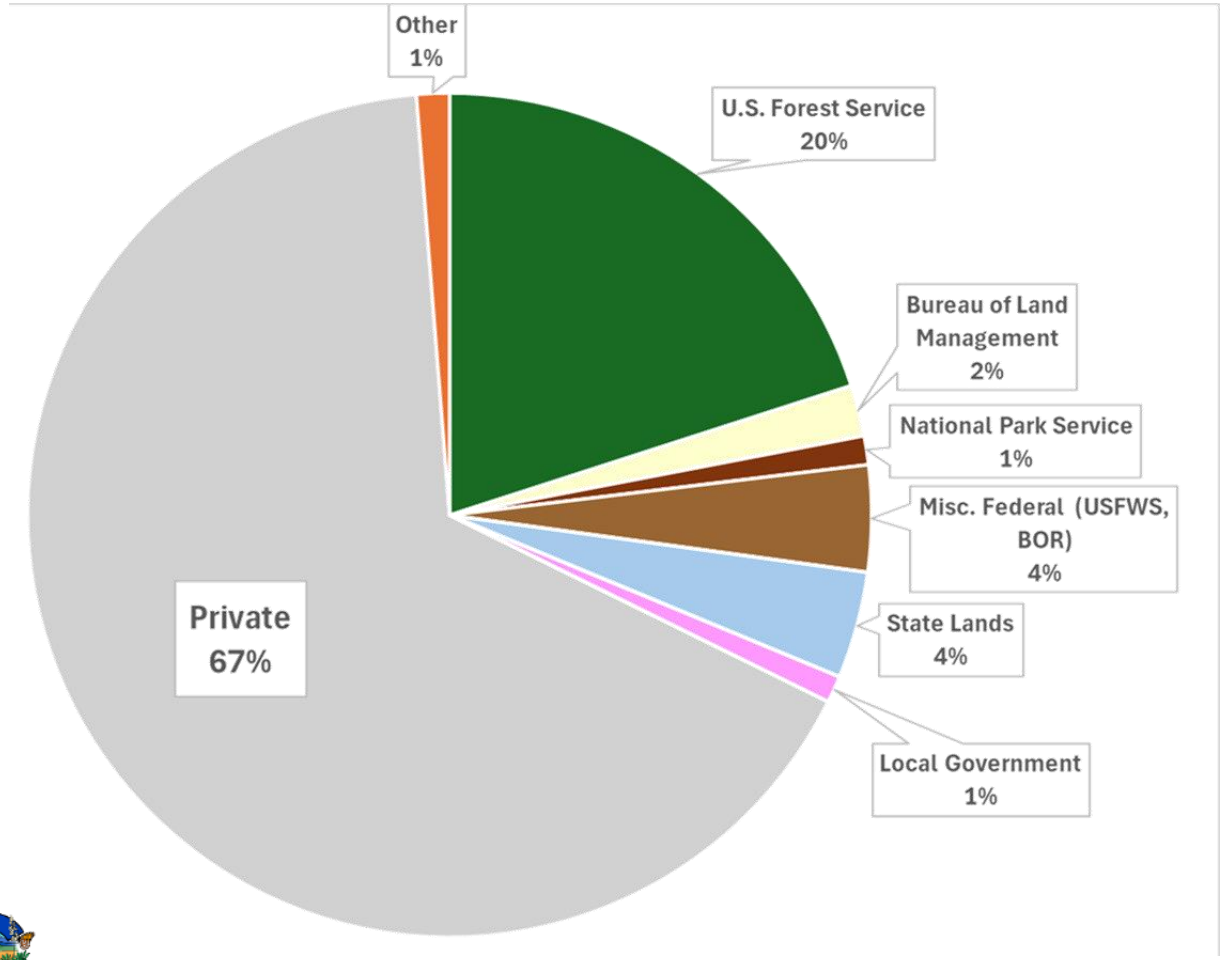
- *Wetlands disproportionally concentrated in the mountains*
- *Largest share of wetland acres are herbaceous*
- *Many acres influenced by flood irrigation along major rivers and valleys*





Wetland Acres by Land Ownership

- *Two-thirds of Colorado wetland acres are on private lands.*
- *USFS is second largest manager of wetlands*



Grouped Owner	Total Land Area within the State		Wetland Acres	
	Acres	% of State	Acres	% of Wet Acres
Federal Lands	**24,210,807**	**36.3%**	**330,642**	**27.2%**
U.S. Forest Service	14,478,649	21.7%	243,877	20.0%
Bureau of Land Management	8,318,857	12.5%	23,764	2.0%
National Park Service	709,144	1.1%	13,398	1.1%
Misc. Federal (USFWS, BOR)	704,157	1.1%	49,602	4.1%
State Lands	**3,235,285**	**4.9%**	**49,850**	**4.1%**
State Land Board	2,798,788	4.2%	30,167	2.5%
Colorado Parks and Wildlife	423,121	0.6%	19,416	1.6%
Misc. State	13,376	< 0.1%	267	< 0.1%
Local Government	**429,382**	**0.6%**	**12,529**	**1.0%**
Cities	248,738	0.4%	8,197	0.7%
Counties	180,644	0.3%	4,332	0.4%
Other	**37,968,791**	**57.0%**	**821,887**	**67.5%**
Private	37,686,888	56.6%	808,924	66.5%
NGO	84,631	0.1%	5,288	0.4%
Land Trust	187,219	0.3%	7,426	0.6%
Special District	10,053	< 0.1%	249	< 0.1%
Tribal	767,995	1.2%	2,360	0.2%
Total	**66,612,260**	**100.0%**	**1,217,267**	**100.0%**

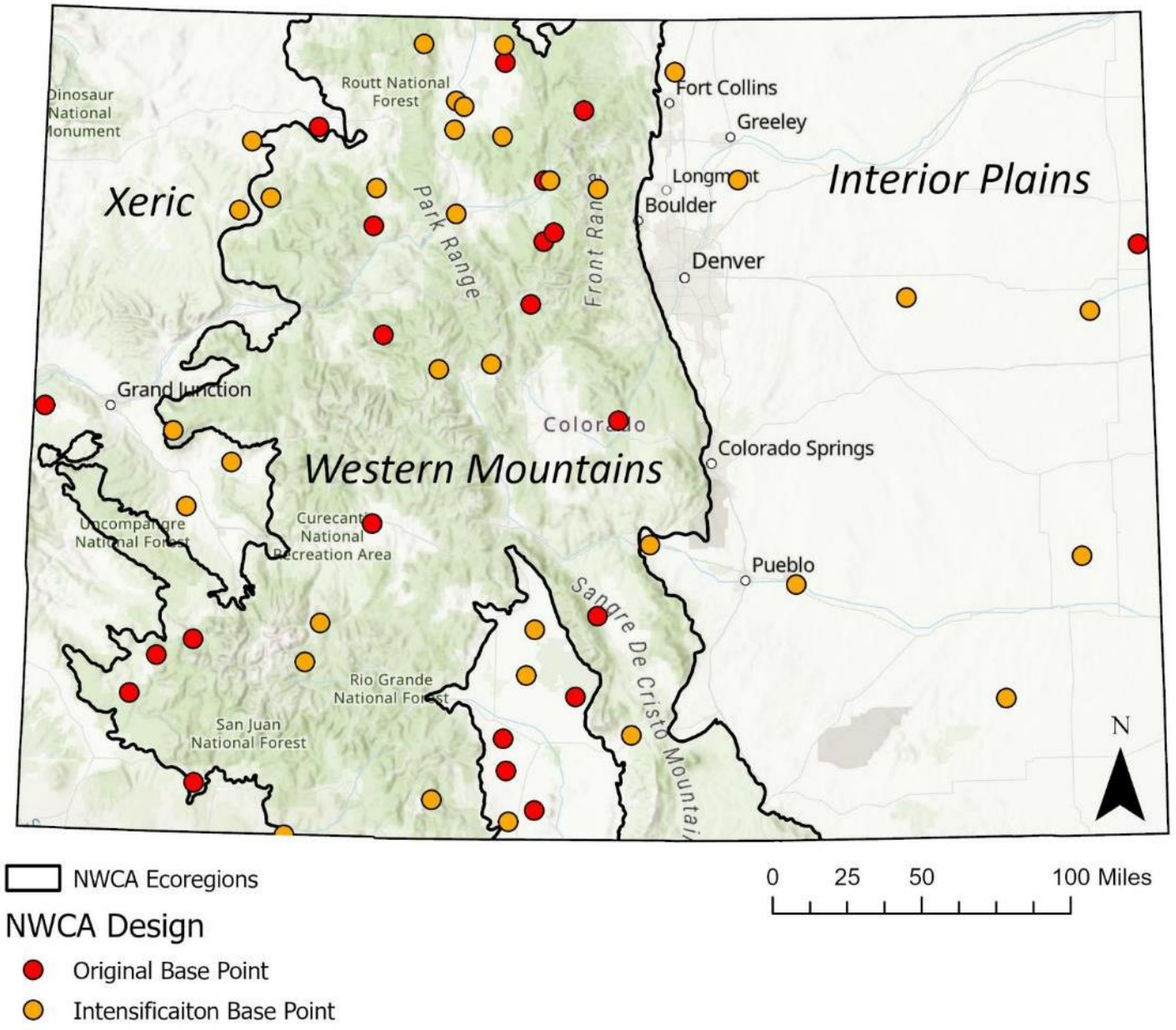
Colorado Intensification of NWCA

Sample design base points:

- *22 original points*
- *28 intensification points funded through a Reg 8 WPDG*

Evaluation Status	NWCA Ecoregion			Total
	Xeric	W Mtns	Int Plains	
Base Points	11	32	7	50

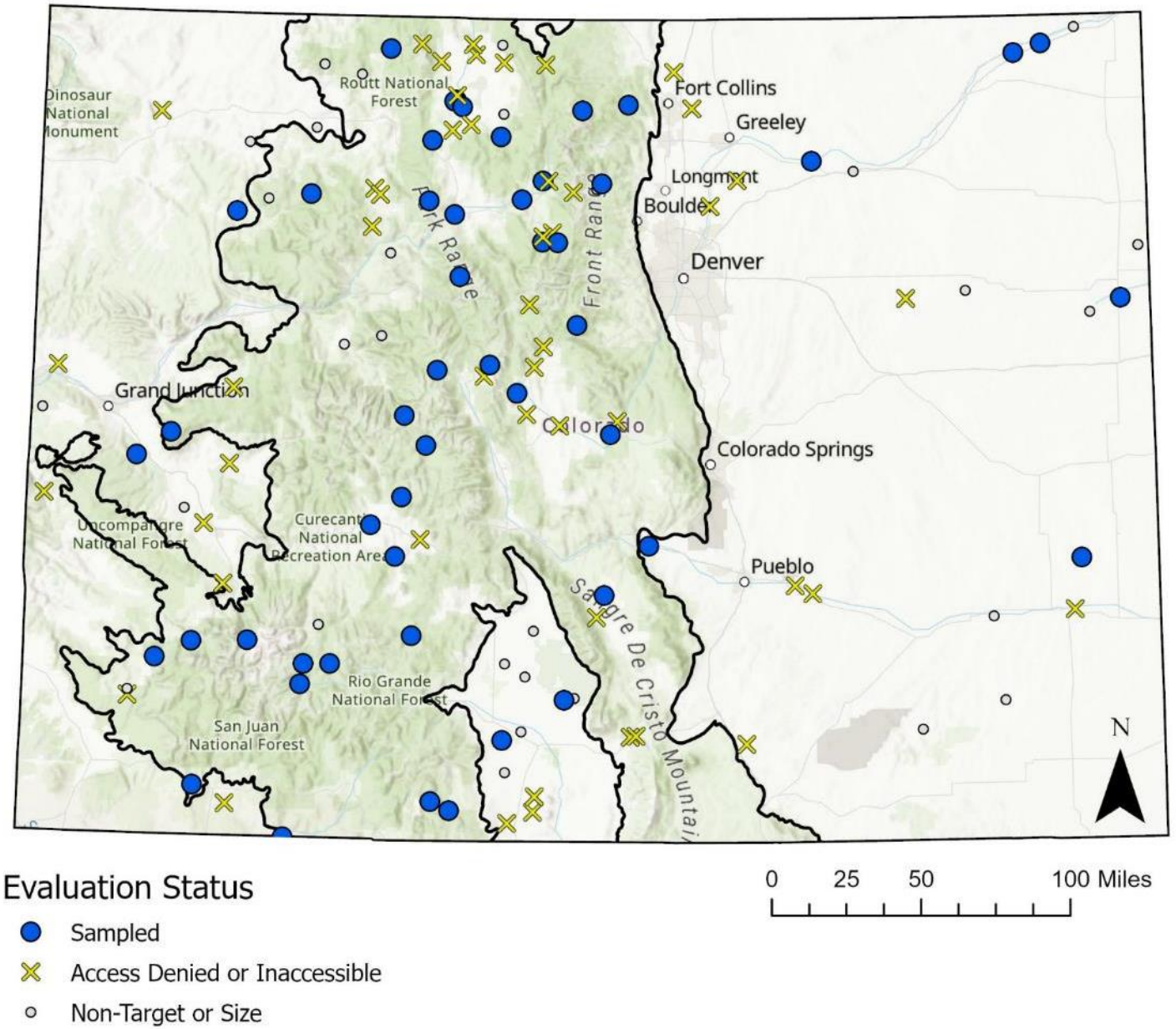
Evaluation Status	Land Ownership		Total
	Federal	Non-Federal	
Base Points	18	32	50



Sample Design Success and Implications

Evaluation Status	NWCA Ecoregion			Total
	Xeric	W Mtns	Int Plains	
Base Points	11	32	7	50
Non-Target or Size	10	11	8	29
Access Denied or Inaccessible	10	29	9	48
Sampled	4	40	6	50
Rejection Rate	83%	50%	74%	61%
Total Evaluated	**24**	**80**	**23**	**127**

Evaluation Status	Land Ownership		Total
	Federal	Non-Federal	
Base Points	18	32	50
Non-Target or Size	11	18	29
Access Denied or Inaccessible	3	45	48
Sampled	28	22	50
Rejection Rate	33%	74%	61%
Total Evaluated	**42**	**85**	**127**



Characteristics of Colorado NWCA Sites

HGM / Veg Class	NWCA Ecoregion			Total
	Xeric	W Mtns	Int Plains	
Riverine	**2**	**23**	**6**	**31**
Herbaceous	1	9	3	13
Woody	1	14	3	18
Slope	**1**	**16**		**17**
Herbaceous	1	9		10
Woody		7		7
Depression / Herb	**1**	**1**		**2**
Total Sampled	**4**	**40**	**6**	**50**

Low stature riparian shrubland in the Western Mountains fed by a small stream.

Open cottonwood gallery forest in the Interior Plains on the floodplain of the South Platte River.

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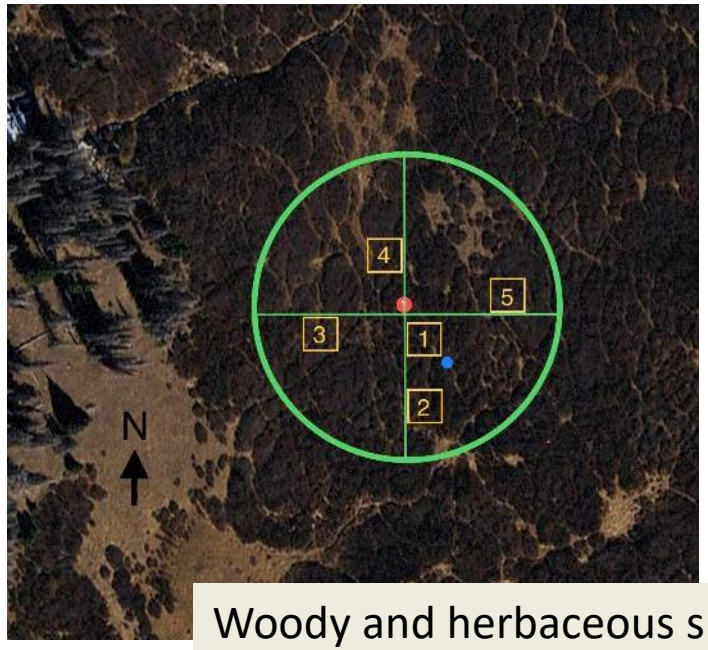
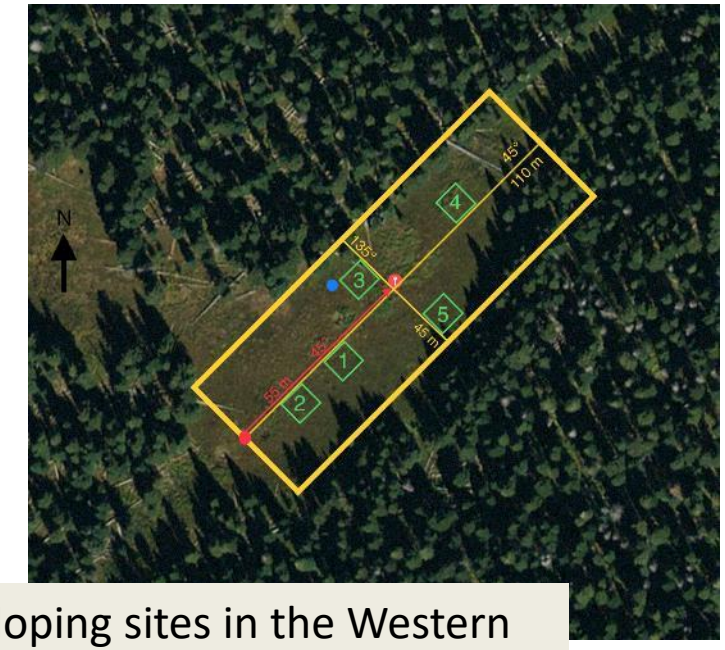




Woody and herbaceous sloping sites in the Western Mountains fed by groundwater and springs.

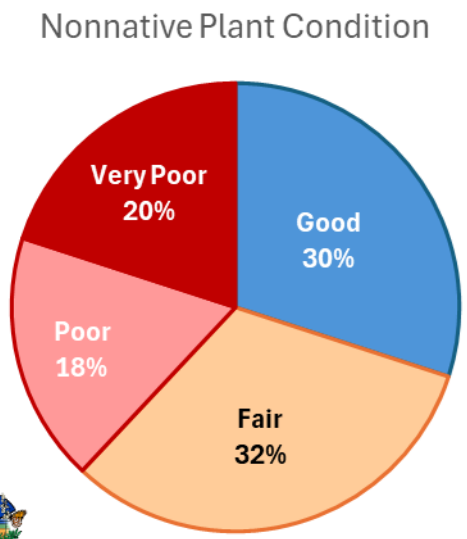
Depressional sites uncommon, associated with small water bodies or natural depressions.

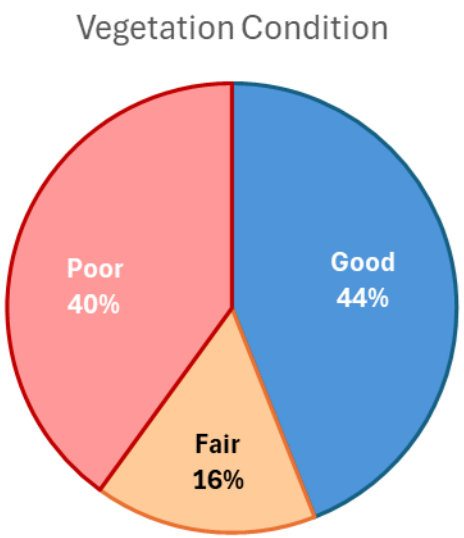
Results: Vegetation Condition

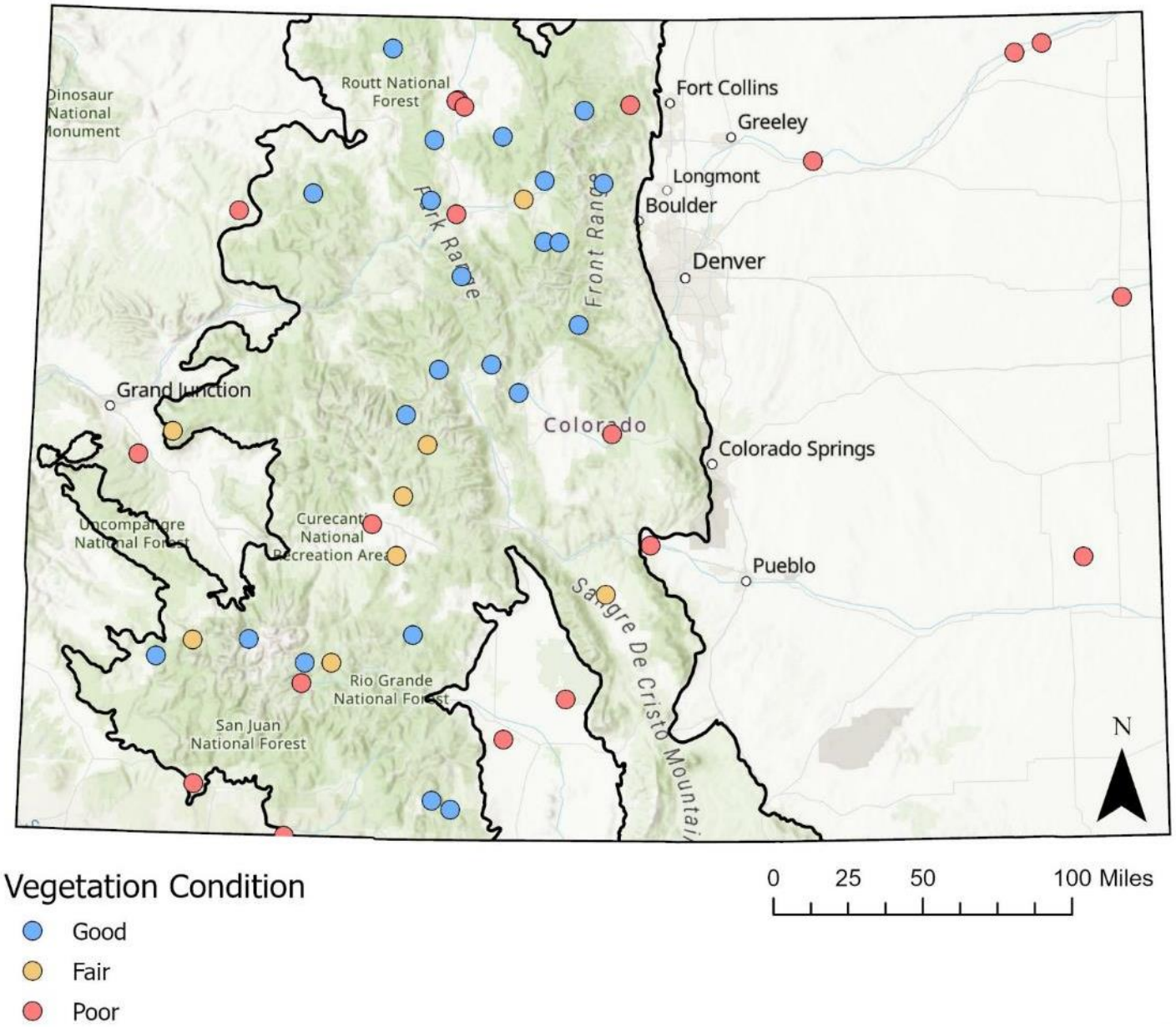
Preliminary results – not population estimates

Vegetation condition highly dependent on elevation and surrounding land use.

- *All sites in Xeric and Interior Plains regions were in poor condition.*
- *Lower elevation sites in W Mtns were in poor condition. High elevation sites in good condition.*
- *20% of sampled sites in very poor condition for nonnative plant condition.*







Results: Common Species by Ecoregion

Scientific Name	Count	Common Name	Growth Habit	Duration	Native Status	C-Value	Wetland Status
Carex utriculata	45	Northwest territory sedge	Graminoid	Perennial	NAT	5	OBL
Carex aquatilis	43	Water sedge	Graminoid	Perennial	NAT	6	OBL
Taraxacum officinale	42	Common dandelion	Forb/herb	Perennial	INTR	0	FACU
Achillea millefolium	38	Common yarrow	Forb/herb	Perennial	NAT	1	FACU
Deschampsia cespitosa	37	Tufted hairgrass	Graminoid	Perennial	NAT	4	FACW
Poa pratensis	35	Kentucky bluegrass	Graminoid	Perennial	CRYP	0	FAC
Calamagrostis canadensis	33	Bluejoint	Graminoid	Perennial	NAT	6	FACW
Salix planifolia	33	Diamondleaf willow	Shrub	Perennial	NAT	7	OBL
Epilobium ciliatum	28	Fringed willowherb	Forb/herb	Perennial	NAT	3	FACW
Pedicularis groenlandica	28	Elephanthead lousewort	Forb/herb	Perennial	NAT	8	OBL

Western Mountains

- *All Perennial*
- *Mostly native*
- *Low to high C-Values*
- *Mostly FACW & OBL, no UPL*

Scientific Name	Count	Common Name	Growth Habit	Duration	Native Status	C-Value	Wetland Status
Cirsium arvense	3	Canada thistle	Forb/herb	Perennial	INTR	0	FACU
Phalaris arundinacea	3	Reed canarygrass	Graminoid	Perennial	CRYP	0	FACW
Asteraceae	2	Aster family	Und	Und	UND		UND
Bromus inermis	2	Smooth brome	Graminoid	Perennial	INTR	0	FACU
Chenopodium	2	Goosefoot	Forb/herb	Annual	UND	2	UND
Convolvulus arvensis	2	Field bindweed	Vine	Perennial	INTR	0	UPL
Conyza canadensis	2	Canadian horseweed	Forb/herb	Annual	NAT	1	FACU
Hordeum jubatum	2	Foxtail barley	Graminoid	Perennial	NAT	2	FAC
Medicago sativa	2	Alfalfa	Forb/herb	Annual	INTR	0	UPL

Xeric

- *Some annuals*
- *Mostly introduced*
- *Low C-Values*
- *Several FACU, UPL*

Scientific Name	Count	Common Name	Growth Habit	Duration	Native Status	C-Value	Wetland Status
Cirsium arvense	4	Canada thistle	Forb/herb	Perennial	INTR	0	FACU
Asclepias speciosa	3	Showy milkweed	Forb/herb	Perennial	NAT	3	FAC
Asteraceae	3	Aster family	Und	Und	UND		UND
Bromus tectorum	3	Cheatgrass	Graminoid	Annual	INTR	0	UPL
Euphorbia esula	3	Leafy spurge	Forb/herb	Perennial	INTR	0	UPL
Lactuca serriola	3	Prickly lettuce	Forb/herb	Annual	INTR	0	FAC
Poaceae	3	Grass family	Graminoid	Und	UND		UND
Populus deltoides	3	Eastern cottonwood	Tree	Perennial	NAT	4	FAC
Salix amygdaloides	3	Peachleaf willow	Shrub	Perennial	NAT	5	FACW
Toxicodendron rydbergii	3	Western poison ivy	Shrub	Perennial	NAT	3	FACU

Interior Plains

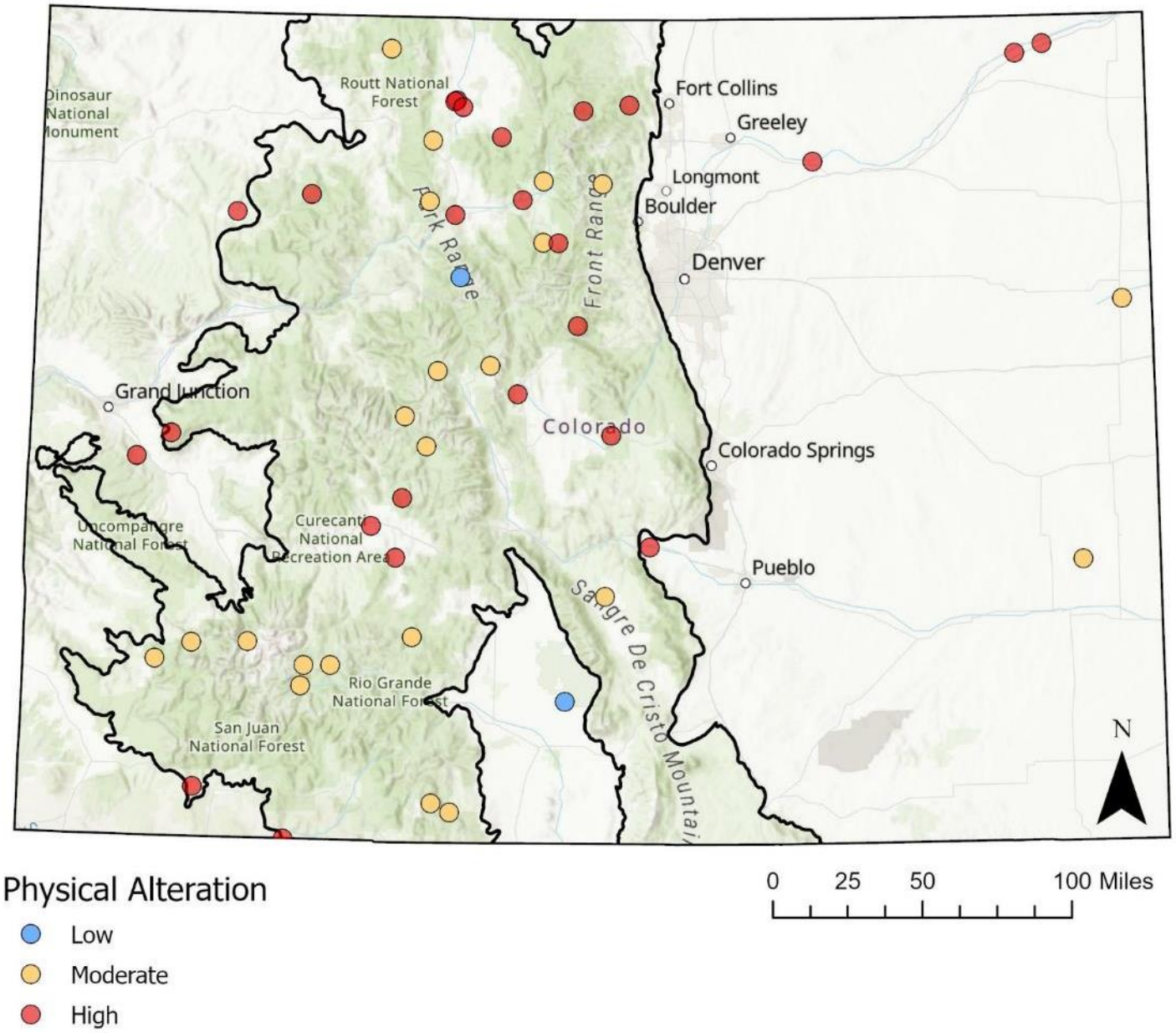
- *Some annuals*
- *Half introduced*
- *Low C-Values*
- *Several FACU, UPL*

Results: Physical Alterations

Physical alterations were present in nearly every site across all three Ecoregions.

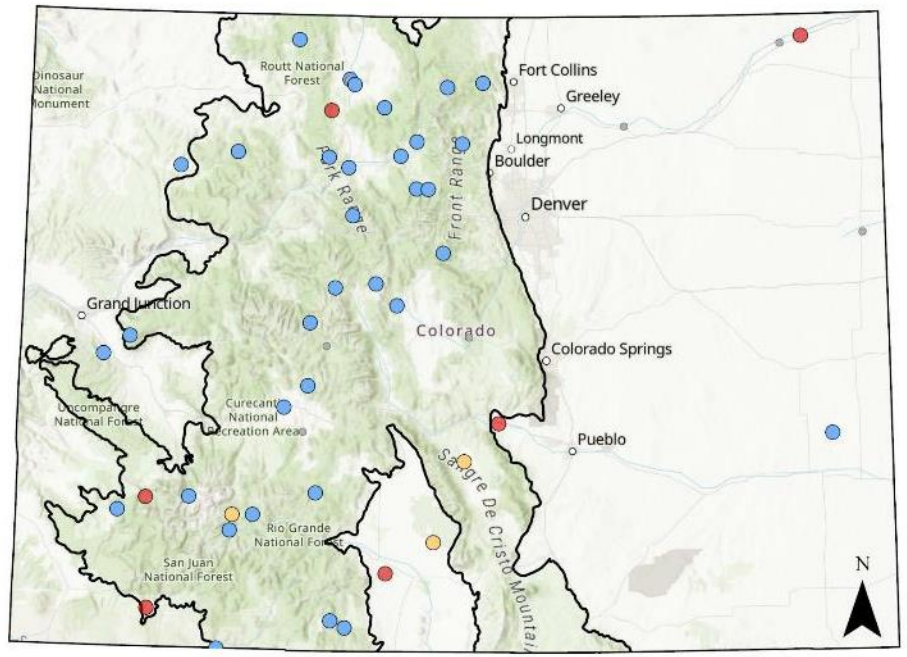
- *Only two sites were rated low for all alteration.*
- *Vegetation removal and replacement were observed most frequently with high stress.*
- *Grazing, rangeland, introduced plants, and browsing were the most common alterations.*
- *Hydrologic alterations were observed in few sites but may have been missed by the buffer protocol.*

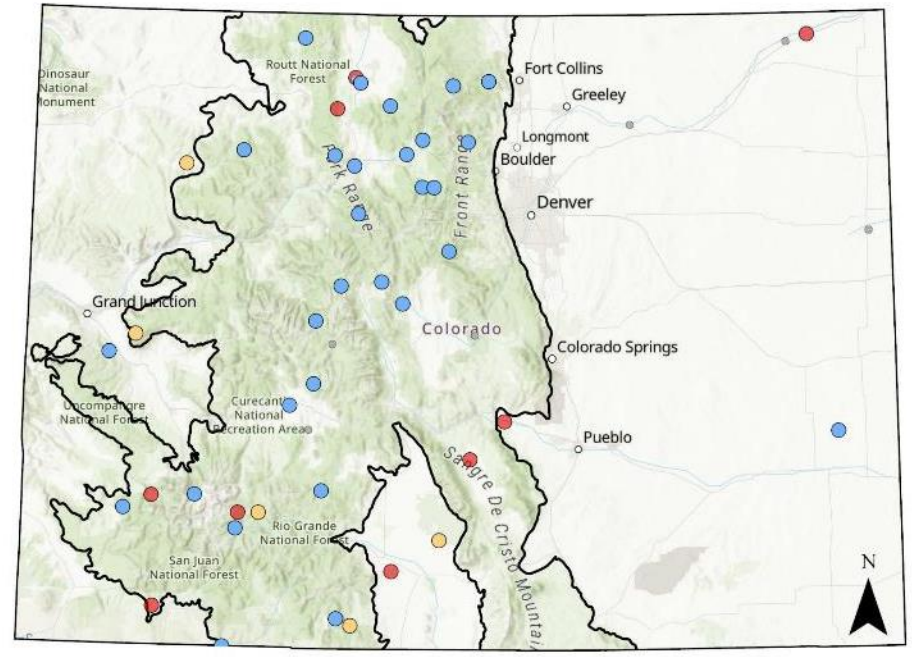
Alteration Type	Degree of Stress		
	Low	Mod	High
Soil Modification	28	15	6
Soil Hardening	16	24	9
Vegetation Removal	22	10	17
Vegetation Replacement	17	15	17
Water Subtractions and Additions	41	5	3
Water Flow Obstructions	43	3	3
All Physical Alteration	**2**	**22**	**25**



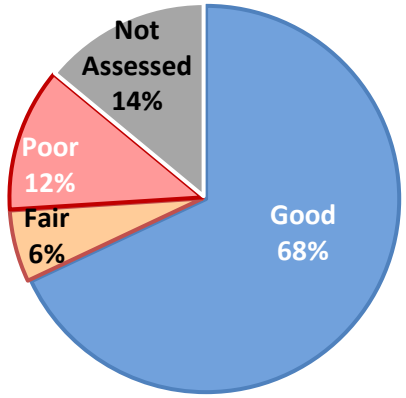
Results: Water Chemistry and Human Health

- *Water quality concerns were generally low.*
- *Only a few sites showed elevated levels of nitrogen and phosphorus.*
- *All at lower elevations.*
- *Toxic microcystins were not detected in any sites sampled.*

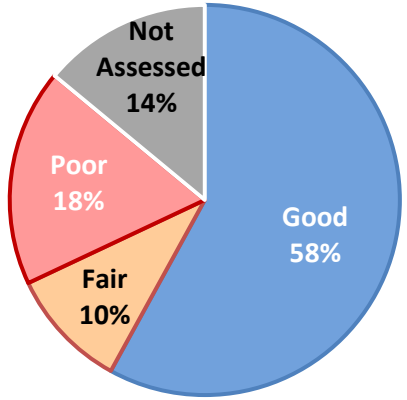




Total Nitrogen



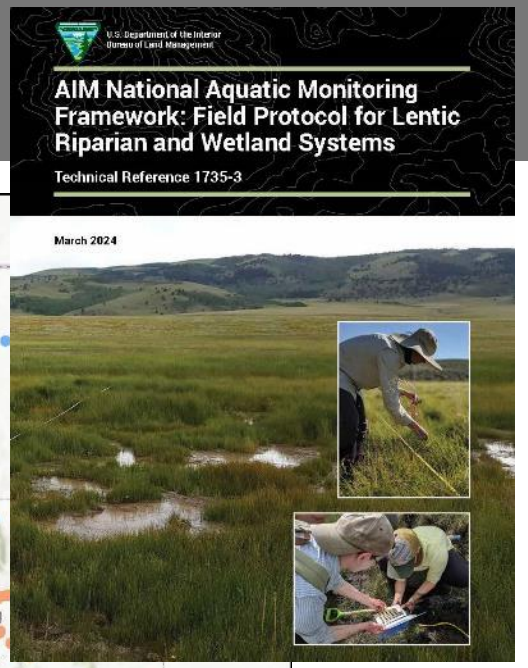
Total Phosphorus

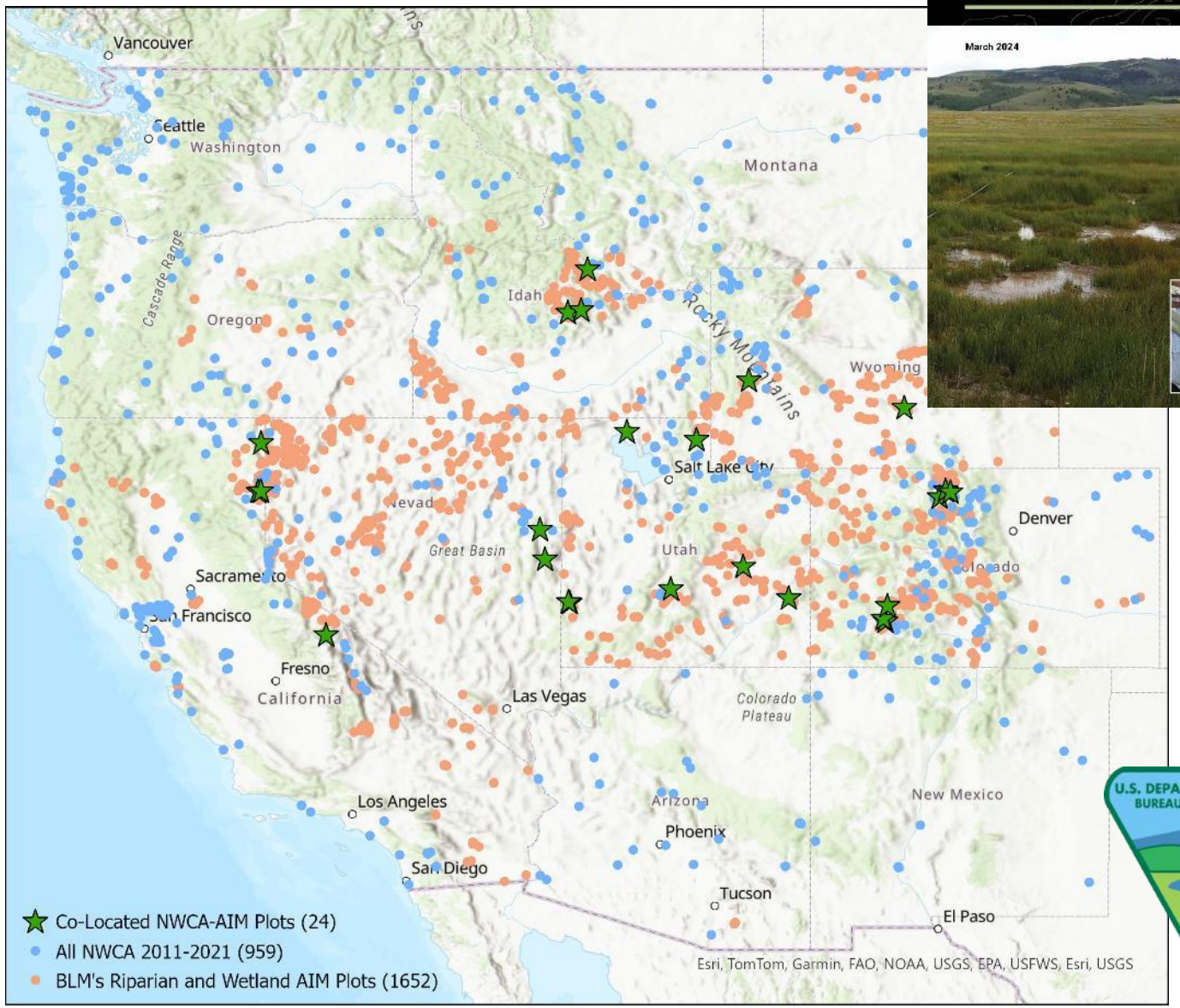


NWCA – BLM R&W AIM Data Comparison

BLM's Assessment Inventory and Monitoring (AIM) Program

- *Three resources: Terrestrial, Lotic (streams), Riparian & Wetland (R&W)*
- *CNHP is the science partner for R&W AIM, helped develop protocol, support program*
- *Line-point intercept (LPI) vegetation method*
- *In 2021, co-located 24 NWCA and BLM AIM sites to compare protocols*



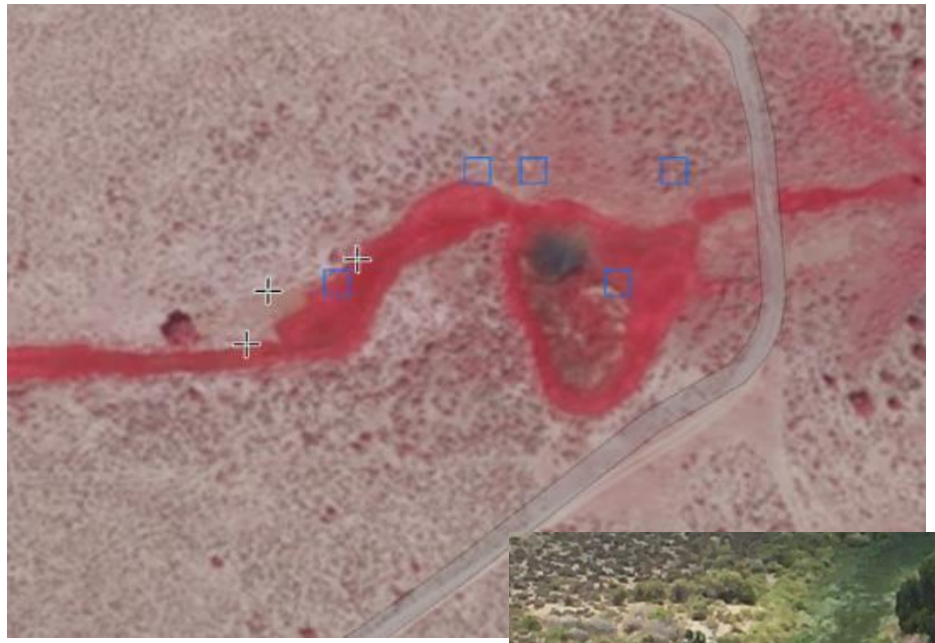


For more information about AIM: https://www.blm.gov/aim

NWCA – BLM AIM Data Comparison

Preliminary results

- *Plot and transect placement made a big difference in data.*
- *Differences in species identification impact analysis.*
- *Cover metrics calculated from NWCA were based on more species than those calculated from AIM LPI data.*



- *Cover estimates for individual species at the same site varied, greatest in graminoids.*
- *Differences in relative cover metrics varied. Grass cover was higher in AIM and shrub cover was higher in NWCA.*
- *Mean C-value was robust across the two survey methods and showed less variation compared to most metrics.*

Conclusions

- *Colorado's wetlands range in condition across the state.*
- *Wetlands at higher elevations in the Western Mountains at in good condition but still experience alterations from grazing and browse.*
  - *Continued conservation and management of these sites is critical to protect their functions and services.*
- *Wetlands at lower elevations are in poor condition and face numerous alterations.*
  - *Lower elevation wetlands are opportunities to partner with landowners on restoration and best management practices.*
- *Difficulty obtaining access to private lands reduced the number of sites sampled in Xeric and Interior Plains regions.*
- *Data from other monitoring programs is important to understand the rang of condition in these regions.*

Benefits and Considerations for Participating in NWCA

Participating in the NWCA has been critical for building Colorado's wetland assessment and monitoring program.

Benefits

- *Technical knowledge, training, equipment.*
- *Experience with large-scale monitoring.*
- *Connections with national EPA and other state wetland programs.*

Considerations:

- *Sampling is very intense, requires botanical and soil expertise.*
- *Obtaining permission to sample on both public and private land requires significant time. Access to private land is very difficult.*
- *In large states, travel can take hours or days to reach each site.*
- *Shipping requirements can be difficult to meet in rural areas.*
- *Costs have risen substantially since the 2011 survey.*

Questions?

Joanna Lemly, Wetland Ecologist
Colorado Natural Heritage Program
Colorado State University
(970) 491-2127
joanna.lemly@colostate.edu
www.cnhp.colostate.edu