

# Colorado Natural Heritage Program

## Wetland Updates and Overview of Work

CNHP Partners Meeting

Fort Collins, CO • March 10, 2020



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[www.cnhp.colostate.edu](http://www.cnhp.colostate.edu)



WARNER COLLEGE  
OF NATURAL RESOURCES  
COLORADO STATE UNIVERSITY



*robust science • tools and resources • partnerships*

## *Guiding questions:*

- 1. How common are wetlands and where are they concentrated?*
- 2. What kinds of wetlands and riparian areas do we have?*
- 3. Which plants and animals depend on them?*
- 4. Which wetlands are most significant for conserving biodiversity?*
- 5. How are our wetlands doing? What condition are they in?*
- 6. Where are the best opportunities for restoration?*

# Colorado Wetland Information Center

Colorado Wetland Information Center

About CWIC | Wetland Types | Wetland Condition | Working in Wetlands | Data & Tools | Library | CNHP Home

CNHP is currently working with eight state agencies to craft a joint strategic plan for managing and protecting wetlands in Colorado.  
[Read More >>](#)

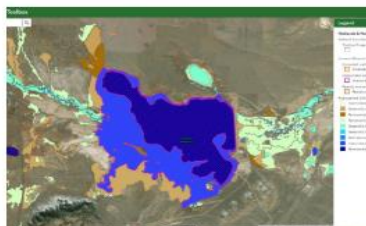
### Collaborations & Partnerships

- U.S. Environmental Protection Agency
- Colorado Parks & Wildlife
- CO Department of Transportation
- NatureServe
- U.S. Forest Service
- Bureau of Land Management
- U.S. Fish & Wildlife Service
- GOCO Great Outdoors Colorado

## Colorado's Source for Comprehensive Wetland Information

The Colorado Wetland Information Center (CWIC) is a resource developed by the **Colorado Natural Heritage Program** through funding from the **U.S. Environmental Protection Agency** and **Colorado Parks and Wildlife**.

### Featured Topics



#### Watershed Toolbox

View over 80 different map layers related to wetland types, habitats, water quality, water quantity, and conservation and



#### Wetland Field Guide

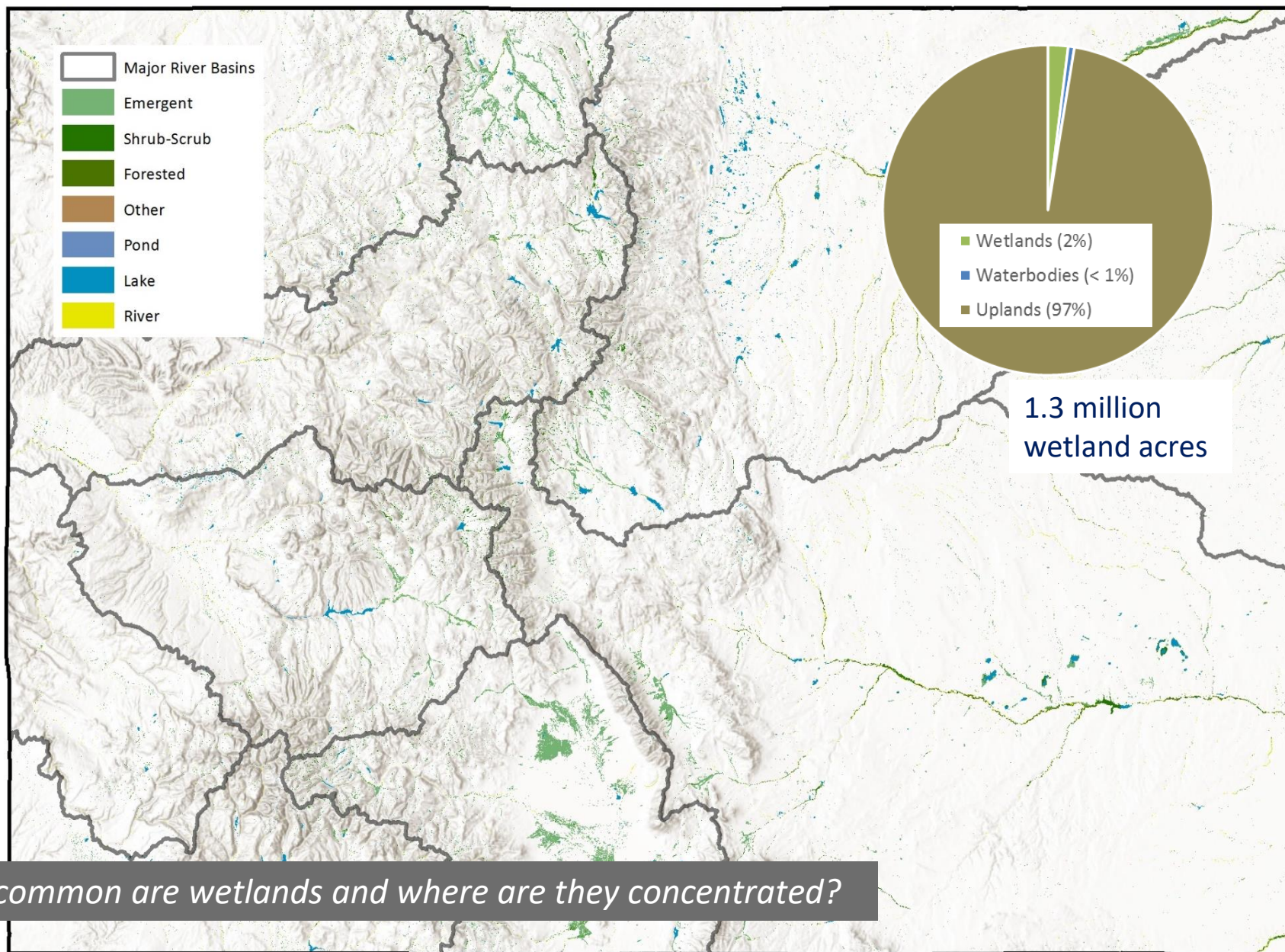
CNHP's field guides and app help wetland professionals and the general public to identify most vascular plant species they



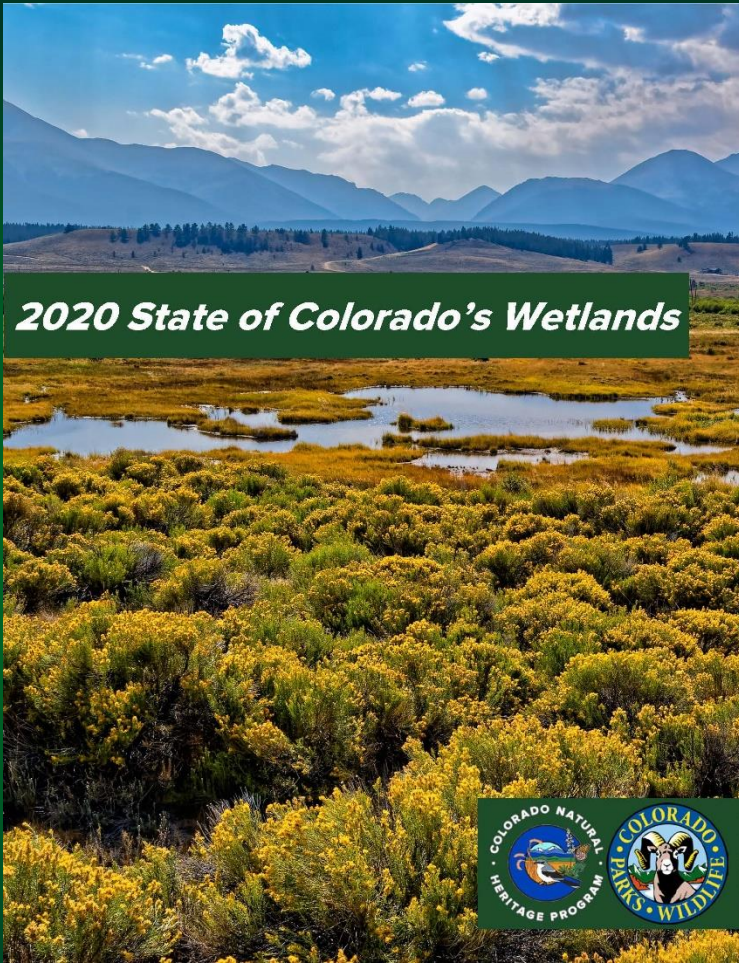
#### Wetland Ecosystems

Colorado contains a range of different wetland types, from fens to playas. See detailed descriptions and photos of our

# Wetlands are rare on the landscape



# State of Colorado's Wetland Report



## 2020 State of Colorado's Wetlands



- Summary and analysis of the statewide National Wetland Inventory dataset



## 2020 State of Colorado's Wetlands

Joanna Lemly, Gabrielle Smith, Sarah Marshall, Karin Decker, and Denise Culver  
Colorado Natural Heritage Program  
Warner College of Natural Resources



### Statewide summary of wetland acres

Colorado covers over 66.6 million acres and ranges in elevation from 3,315 to 14,440 feet. The state's topography is highly diverse, ranging from sandstone canyons, meads, and plateaus on the Western Slope to rugged peaks of the southern Rocky Mountains and open grasslands on the eastern High Plains. Based on statewide NWI mapping, the state contains 2.1 million acres of wetlands, waterbodies, and riparian areas, representing 3.2% of the total land area (Figures 4 & 4, Table 1). Of those, 1,217,282 acres (58%) are wetlands, another 736,442 (35%) are waterbodies, and the remaining 111,815 (5%) are non-wetland riparian areas. Wetlands alone cover only 1.8% of the state, given multiple lines of evidence that indicate Colorado's climate is warmer and drier than when wetlands were mapped; actual wetland acreage today may be lower.

**Wetlands Acres by General Type**  
Of the 1.2 million wetland acres mapped by NWI, herbaceous wetlands are the most abundant type, with 822,717 acres or 68% of wetland acres (Table 1).

### Contents

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- Map of Potential Conservation Areas ..... 30
- Arkansas River Basin..... 33
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- Dolores River Basin..... 57
- Gunnison River Basin..... 68
- North Platte River Basin ..... 81
- Republican River Basin ..... 93
- Rio Grande Headwaters Basin ..... 103
- San Juan River Basin..... 115

## Section for each major river basin

included in the NWI data because they may have held water in wetter years.

Forested wetlands are the second smallest wetland class, accounting for 27,416 acres or 2% of wetland acres. Most forested acres occur along the floodplains of the largest rivers, or in narrow bands along foothill streams. Occasional small forested fens can be found at higher elevations. The acreage of forested wetlands is substantially less than what was mapped originally by NWI. Most forested wetland polygons on the eastern plains were converted to non-wetland riparian areas, based on earlier findings from both spatial analyses and field-based data collection.

Lastly, farmed wetlands are the smallest class of wetlands, with 10,422 acres or 0.9% of wetland acres. Nearly all farmed wetlands are plays on the eastern plains that have been altered through plowing or other soil disturbance. Farmed wetlands within NWI do not include irrigated hayfields.

In addition to wetlands, NWI mapping contains nearly 900,000 acres of waterbodies. The 198,247 acres of lakes and shores includes both large artificial reservoirs and small natural lakes.

The very high acreage of intermittent streams (406,352 acres) is likely inflated. By NWI mapping convention, all intermittent stream polygons were drawn as 3 meters wide, but this is likely wider than many intermittent channels. Small streams are best measured in linear miles rather than acres, but all modern NWI data are polygons rather than line features, resulting in an artificially high area for intermittent systems.

Acreages for perennial streams and sandbars are more accurate than for intermittent streams because these features do have observable width that match the polygon boundaries. Of the perennial rivers and streams, high gradient rivers and streams at higher elevations account for 67,990 acres—far more than the larger, low-gradient rivers they feed into.

Streams added from the National Hydrography Dataset (NHD) contribute nearly 40,000 acres. These polygons were not classified as either perennial or intermittent streams because they represent small segments of NHD lines and occur throughout the state. It is impossible to accurately attribute each segment without manual examination.

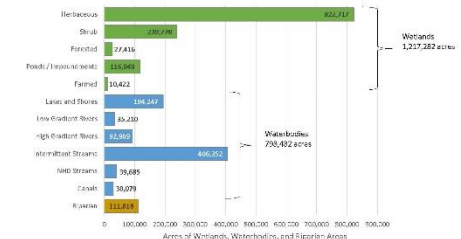
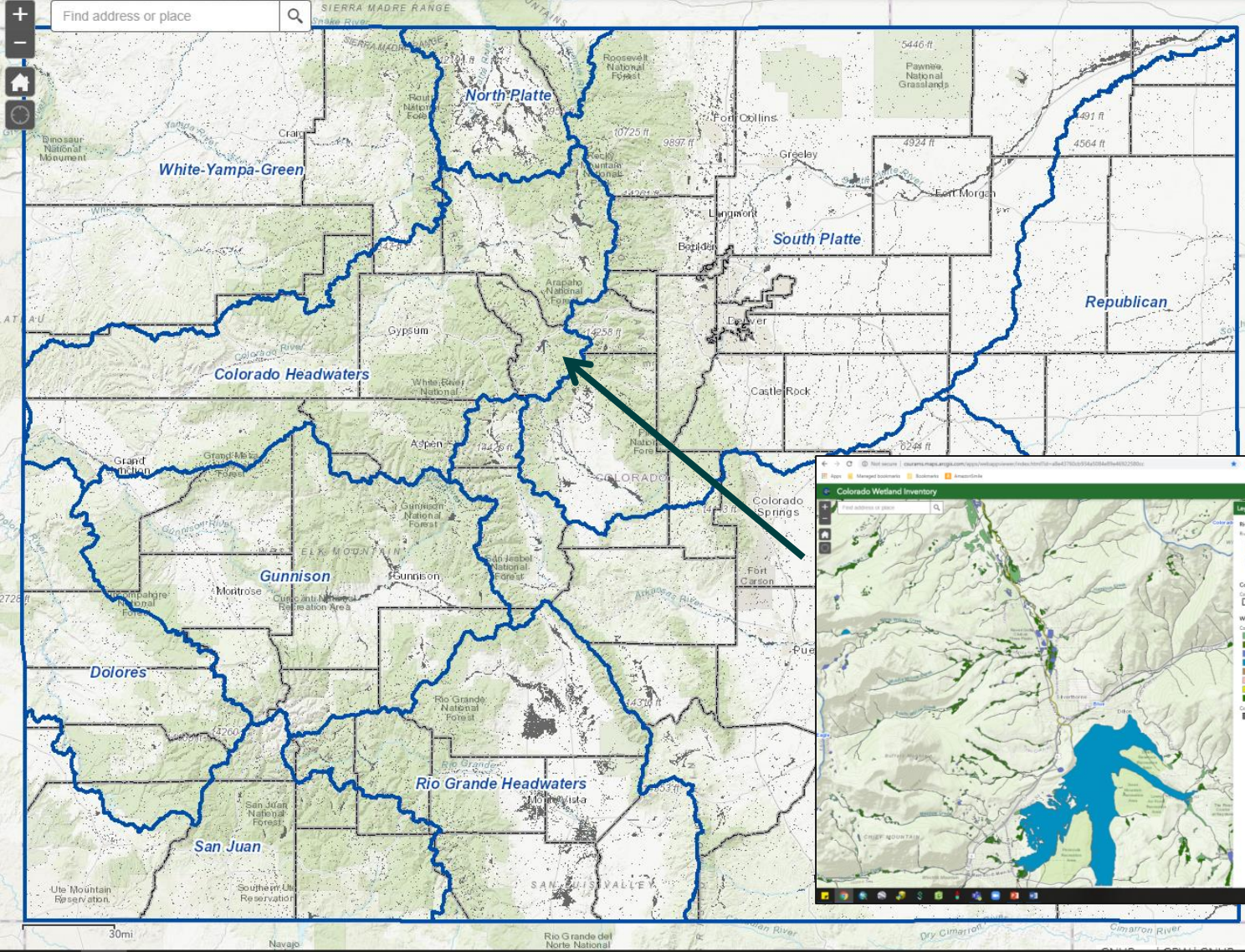


Figure 4. Wetland and waterbody acreage within Colorado by major type. 2020 State of Colorado's Wetlands. Statewide Summary - Page 12

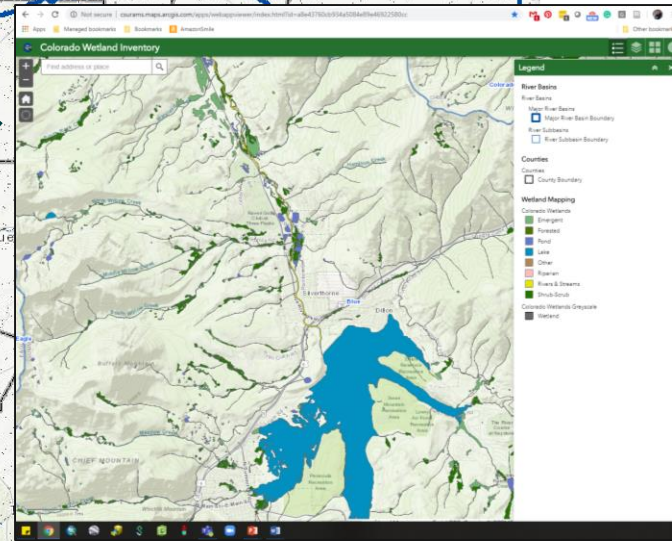
# Colorado Wetland Inventory Mapper



### Layer List

Layers

- River Basins
- Counties
- Vegetation Plots
- Wetland Mapping
- Riparian Mapping
- Fen Mapping
- Playa Mapping
- Warm Water Slough Mapping
- Wetland Data Summaries
- CNHP Potential Wetland Conservation Areas



# USFS and CDOT Fen Mapping

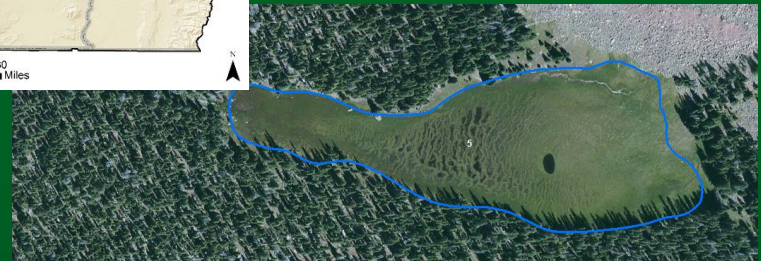
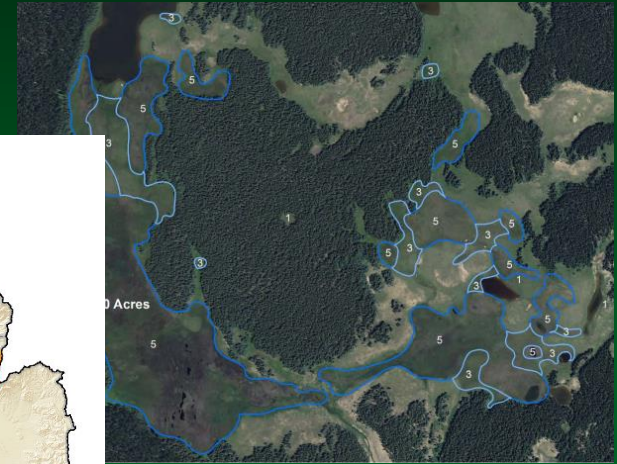
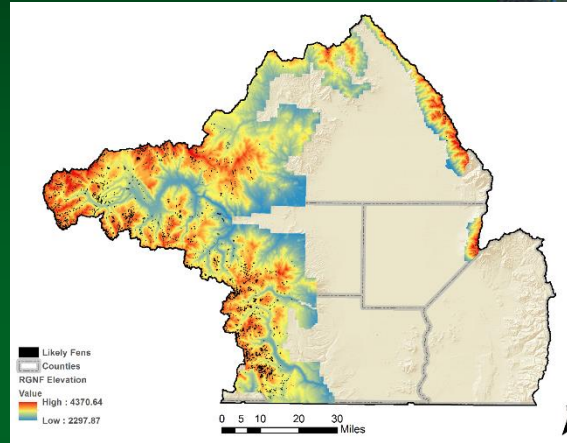
Fens are groundwater wetlands with organic soils.

Old growth wetlands with high conservation value.

Fen mapping projects for:

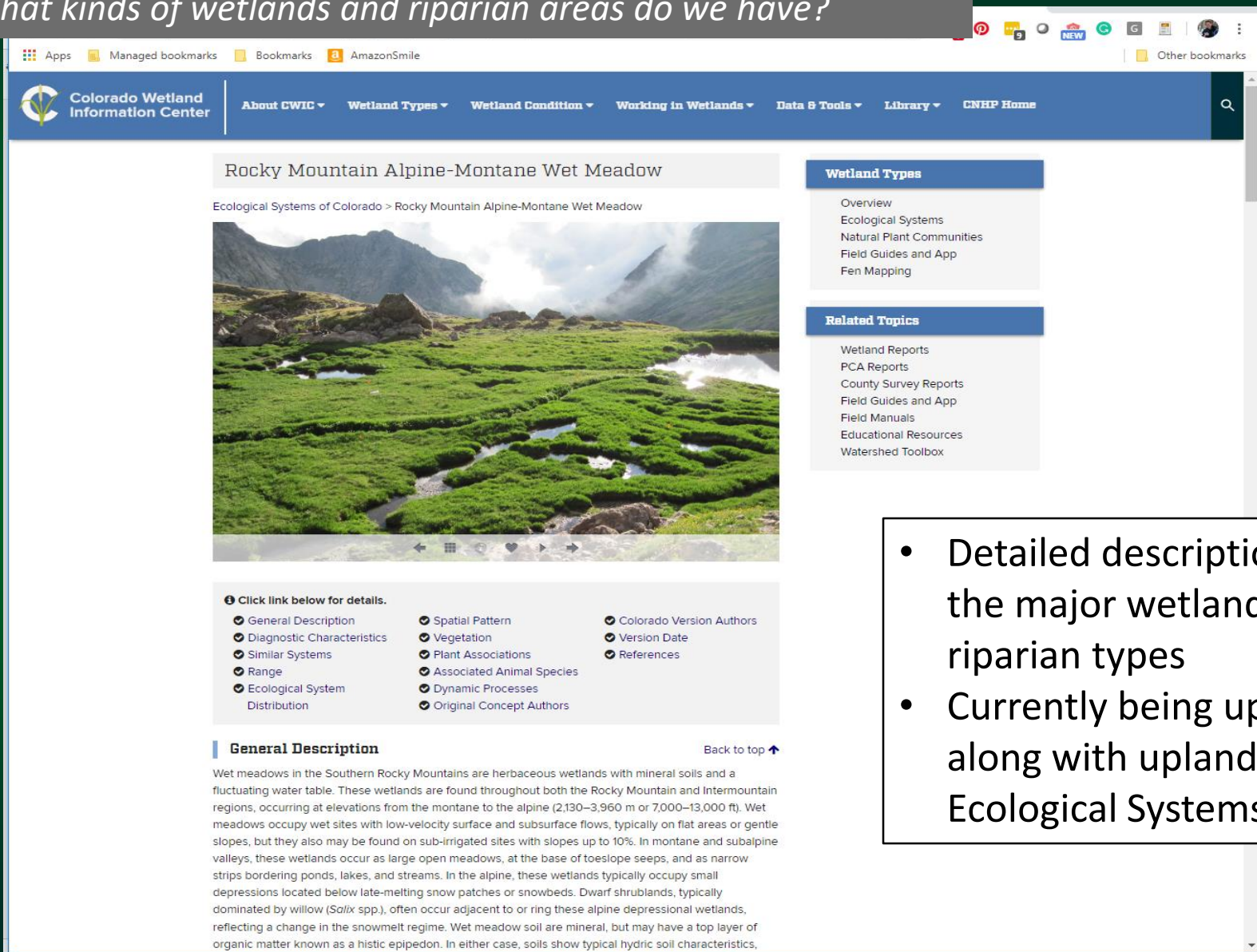
- CO Dept of Transportation
- White River National Forest
- Rio Grande National Forest
- All Forests in USFS Region 4 (ID, NV, UT, WY)

Series of reports on website.



# Wetland Ecological Systems

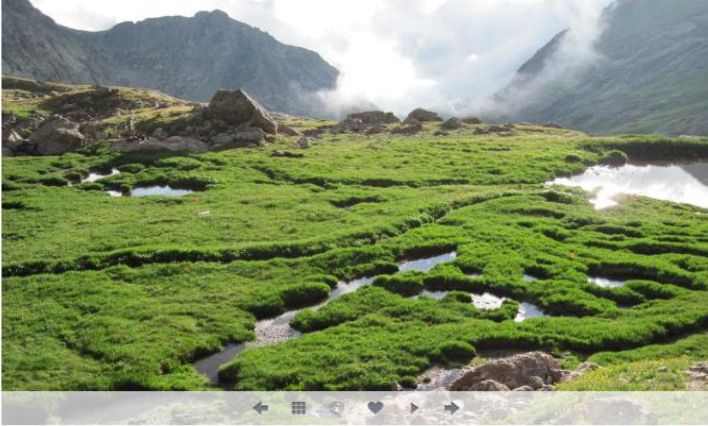
What kinds of wetlands and riparian areas do we have?



The screenshot shows the Colorado Wetland Information Center website. The main heading is "Rocky Mountain Alpine-Montane Wet Meadow". Below the heading is a photograph of a wet meadow in a mountainous landscape. To the right of the main content is a sidebar with "Wetland Types" and "Related Topics" sections. Below the photograph is a list of links for more details, including "General Description", "Diagnostic Characteristics", "Similar Systems", "Range", "Ecological System Distribution", "Spatial Pattern", "Vegetation", "Plant Associations", "Associated Animal Species", "Dynamic Processes", "Original Concept Authors", "Colorado Version Authors", "Version Date", and "References". Below the list is a "General Description" section with a "Back to top" link.

**Rocky Mountain Alpine-Montane Wet Meadow**

Ecological Systems of Colorado > Rocky Mountain Alpine-Montane Wet Meadow



**Wetland Types**

- Overview
- Ecological Systems
- Natural Plant Communities
- Field Guides and App
- Fen Mapping

**Related Topics**

- Wetland Reports
- PCA Reports
- County Survey Reports
- Field Guides and App
- Field Manuals
- Educational Resources
- Watershed Toolbox

**Click link below for details.**

- General Description
- Diagnostic Characteristics
- Similar Systems
- Range
- Ecological System Distribution
- Spatial Pattern
- Vegetation
- Plant Associations
- Associated Animal Species
- Dynamic Processes
- Original Concept Authors
- Colorado Version Authors
- Version Date
- References

**General Description** [Back to top](#)

Wet meadows in the Southern Rocky Mountains are herbaceous wetlands with mineral soils and a fluctuating water table. These wetlands are found throughout both the Rocky Mountain and Intermountain regions, occurring at elevations from the montane to the alpine (2,130–3,960 m or 7,000–13,000 ft). Wet meadows occupy wet sites with low-velocity surface and subsurface flows, typically on flat areas or gentle slopes, but they also may be found on sub-irrigated sites with slopes up to 10%. In montane and subalpine valleys, these wetlands occur as large open meadows, at the base of toeslope seeps, and as narrow strips bordering ponds, lakes, and streams. In the alpine, these wetlands typically occupy small depressions located below late-melting snow patches or snowbeds. Dwarf shrublands, typically dominated by willow (*Salix* spp.), often occur adjacent to or ring these alpine depressional wetlands, reflecting a change in the snowmelt regime. Wet meadow soil are mineral, but may have a top layer of organic matter known as a histic epipedon. In either case, soils show typical hydric soil characteristics.

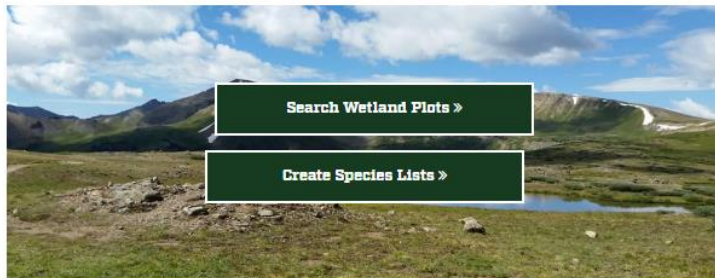
- Detailed descriptions of the major wetland and riparian types
- Currently being updated along with upland Ecological Systems



# NEW: Wetland Plots Database

## Wetland Plots Database

Welcome to the **Wetland Plots Database**. This database contains field-collected data from nearly 3,000 plots in wetlands and riparian areas across Colorado. The data were collected through multiple projects over 30 years, starting in the 1990s. Data types include detailed vegetation data, soil profiles, water chemistry measurements, and condition and stressor metrics. Not all data are available for every plot, but all plots contain at least a species list. Plots collected on public land can also be viewed through the **Colorado Wetland Inventory Mapper**, but plots collected on private land are not shown on the mapper.



By clicking on **Search Wetland Plots**, the plots can be filtered and searched by wetland type, county, watershed, and many other characteristics. From the search results, users can click to view details of a particular plot and can download a PDF of all collected data.

By clicking on **Create Species Lists**, users can set filter criteria and generate a species list that averages the cover and frequency of plant species observed within the filtered plots. For example, by setting the filter criteria to include the Rocky Mountain Alpine-Montane Wet Meadow Ecological System and Boulder County, a user could see a list of plant species that most commonly occur in wet meadows in Boulder County. To explore further, the list could be constrained to Excellent or Good condition wet meadows or by a certain elevation range, providing a target species list for wet meadow restoration in Boulder County.

A subset of the plots in this database has been designated as the **Colorado Wetland Reference Network**. These sites have been selected as reference sites because they possess relatively intact hydrology, soils, and vegetation and can serve as a reference for high-quality conditions. All reference sites are located on public land.

**Database Version Date:** October 2018

✉ For information, contact Joanna Lemly.

(Edit)

Search Wetland and Riparian Plots

Plot Database > Site Visit List

**Select filters.**

**Filters:**

**Wetland Type:**  
Ecological System: --All-- HGM Class: --All-- Cowardin Class: --All--  
Overall Condition: --All--  
 Reference Network Site

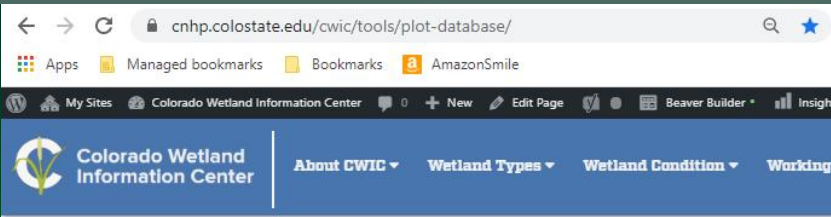
**Geographical Location:**  
County: --All-- HUC 6: --All-- HUC 12: --All--  
EPA Ecoregion: --All-- Wetland Indicator Region: --All--  
Elevation Range: [ ] to [ ] Meter  
Land Status (Ownership and Management): --All--

You are viewing **2894** of **2894** Site Visits.

Show 10 entries

Site ID	County	HUC12 Name	Ecological System	Cowardin	HGM Class	Overall Condition	Survey Date	Option
21-0304	JACKSON	Deer Creek-Illinois River	Rocky Mountain Alpine-Montane Wet Meadow	PEMAb	Riverine	A: Excellent	2018/08/14	<a href="#">View Details</a>
21-0254	JACKSON	Potter Creek	Rocky Mountain Alpine-Montane Wet Meadow	PEMC	Lacustrine Fringe	A: Excellent	2018/08/13	<a href="#">View Details</a>
21-0080	JACKSON	Soap Creek	Rocky Mountain Alpine-Montane Wet Meadow	PEMA	Novel	B: Good	2018/08/13	<a href="#">View Details</a>
21-0026	JACKSON	Owl Ridge-Illinois River	Rocky Mountain Alpine-Montane Wet Meadow	PEMA	Riverine	A: Excellent	2018/08/12	<a href="#">View Details</a>
21-0429	JACKSON	Owl Ridge-Illinois River	Rocky Mountain Alpine-Montane Wet Meadow	PEMA	Riverine	A: Excellent	2018/08/12	<a href="#">View Details</a>
21-0843	JACKSON	Lake Creek	North American Arid West Emergent Marsh	PEMF	Lacustrine Fringe	A: Excellent	2018/08/11	<a href="#">View Details</a>

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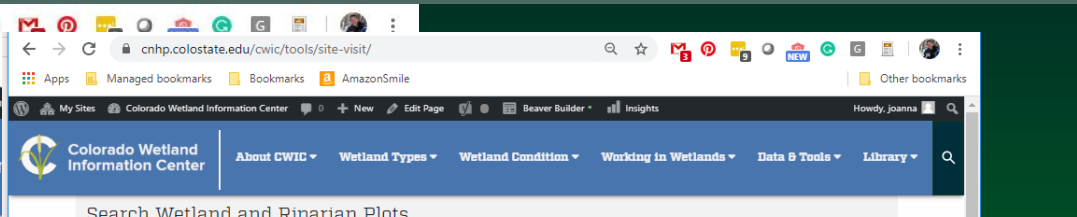
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**Database Version Date:** October 2018

✉ For information, contact Joanna Lemly.

(Edit)



## Vegetation Summary Data

Plot Database > Vegetation Summary Data

Select filters.

Filters:

**Wetland Type:**

Ecological System: Rocky Mountain Subalpine-Montane Riparian Shrubland HGM Class: --All-- Cowardin Class: --All--  
Overall Condition: --All--  
 Reference Network Site

**Geographical Location:**

County: Jackson HUC 6: --All-- HUC 12: --All--  
EPA Ecoregion: --All-- Wetland Indicator Region: --All--  
Elevation Range: to Meter  
Land Status (Ownership and Management): --All--

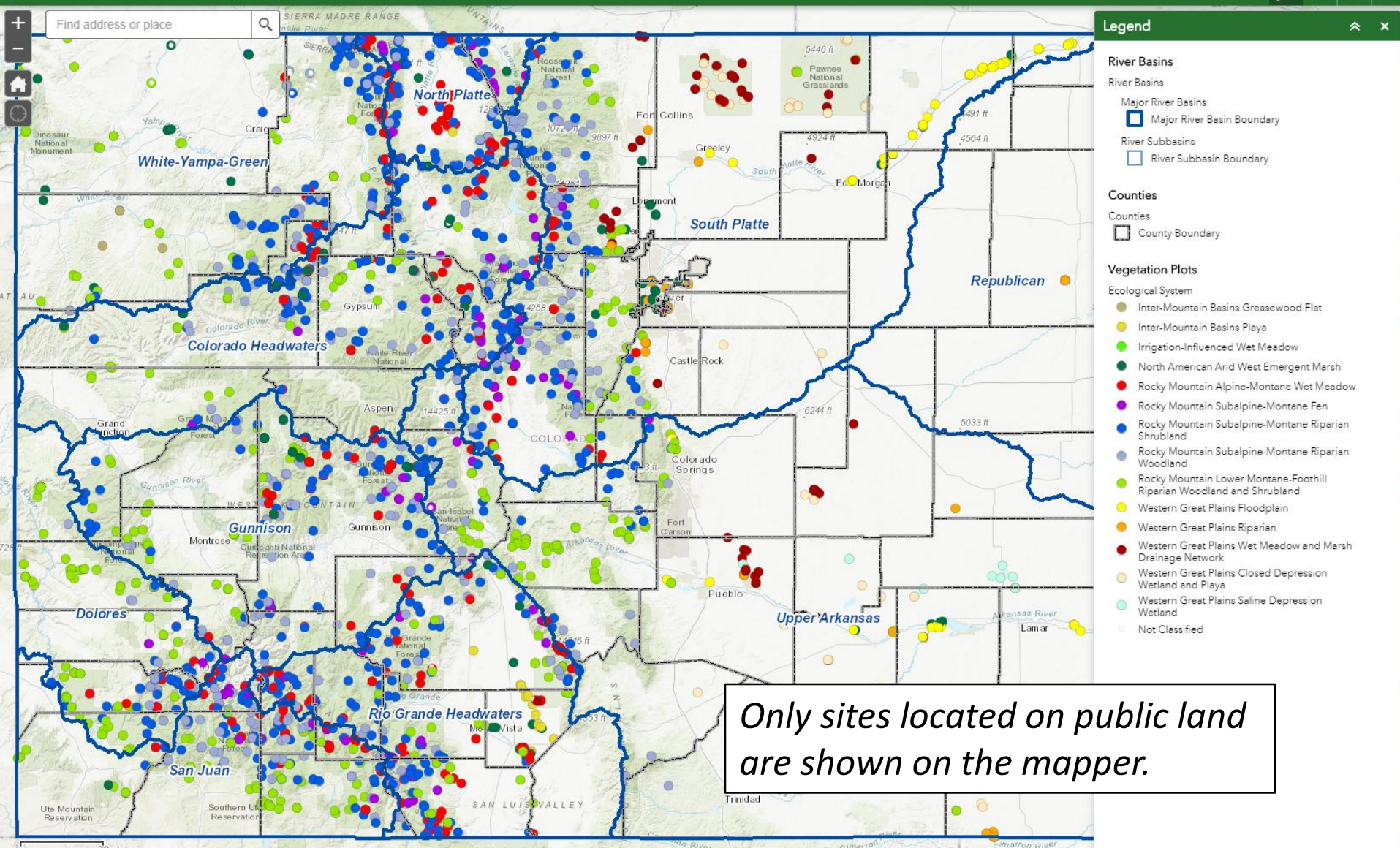
Filter Vegetation Summary Data Clear Filter Download

You are viewing 463 vegetation summary data of 2738 species records (from 74 site visits).

Show 25 entries

Species	Common Name	Native Status	C Value	Average Cover	Count of Plots
<i>Carex utriculata</i>	Northwest Territory sedge	Native	5	13.63	50 / 74
<i>Carex aquatilis</i>	water sedge	Native	6	11.29	48 / 74
<i>Taraxacum officinale</i>	common dandelion	Non-native	0	2.56	48 / 74
<i>Fragaria virginiana</i> spp. <i>glauca</i>	Virginia strawberry	Native	5	1.85	46 / 74
<i>Mertensia ciliata</i>	tall fringed bluebells	Native	7	2.65	44 / 74
<i>Calamagrostis canadensis</i>	bluejoint	Native	6	12.28	42 / 74
<i>Geum macrophyllum</i> var. <i>perincisum</i>	largeleaf avens	Native	6	1.08	41 / 74
<i>Salix planifolia</i>	diamondleaf willow	Native	7	24.64	40 / 74
<i>Achillea millefolium</i> var. <i>occidentalis</i>	western yarrow	Native	4	1.00	37 / 74

# NEW: Wetland Plots Database



Only sites located on public land are shown on the mapper.

# NEW: Wetland Plots Database

Not secure | csurams.maps.arcgis.com/apps/webappviewer/index.html?id=a8e43760cb934a5084e89e46922580cc

Apps Managed bookmarks Bookmarks AmazonSmile Other bookmarks

## Colorado Wetland Inventory

Find address or place

SIERRA MADRE RANGE  
White-Yampa-Green  
North Platte  
South Platte  
Colorado Headwaters  
Gunnison  
Dolores  
Rio Grande Headwaters  
Upper Arkansas

Roose National Forest  
Fort Collins  
Greeley  
Lafayette  
CastlesRock  
Colorado Springs  
Fort Carson  
Montrose  
Gunnison  
San Juan  
Trinidad

Ecological System: Inter-Mountain Basins Plays  
Survey Date: 6/14/2018  
Plot Data Link: [More info](#)  
[Zoom to](#)

### Colorado Wetland Information Center

Site Visit Details: Site Data, Site Visit, Vegetation, Soil Pits, Hydrology, Ecological Condition, Stressors

Site Visit Details (ID:RL-010\_20180615)  
Plot Database - Site Visit List - Site Visit Details (ID:RL-010\_20180615)  
Site Visits: 18 of 2894

Project Code: 2018\_REFNET  
Project Name: Wetland Reference Network  
Site Code: RL\_010  
Reference Network Site: No

Vegetation: Plot Species Richness: 10, Percent Non-Native: 0.0%

Ecological Condition: Overall Ecological Integrity Score and Rank, Rank Factor: Landscape Context (0.33)

Overall Ecological Integrity Score and Rank	Weight	Field Rating	Field Points
LAN1. Contiguous Natural Land Cover		B	300
LAN2. Land Use Index		A	400

Land Cover Comments: Land Use Index of 9.62. Entire SWSA closed from 2/15 within the closed refuge area for waterfowl season, so use is highly limited. Very visitation.

Buffer Metrics	Weight	Field Rating	Field Points
BUF1. Perimeter with Natural Buffer		A	400
BUF2. Width of Natural Buffer		B	300
BUF3. Condition of Natural Buffer - Veg		A	400
BUF4. Condition of Natural Buffer - Soils		A	400

Buffer Comments:

Rank Factor: Condition 0.7

Vegetation Metrics	Weight	Field Rating	Field Points
VEG1. Native Plant Species Cover		A	400
VEG2. Invasive Non-native Plant Species Cover		A	400
VEG3. Native Plant Species Composition		A	400
VEG4. Vegetation Structure		A	400
VEG5. Regen. of Native Woody Species (opt.)		A	400
VEG6. Coarse and Fine Woody Debris (opt.)		A	400

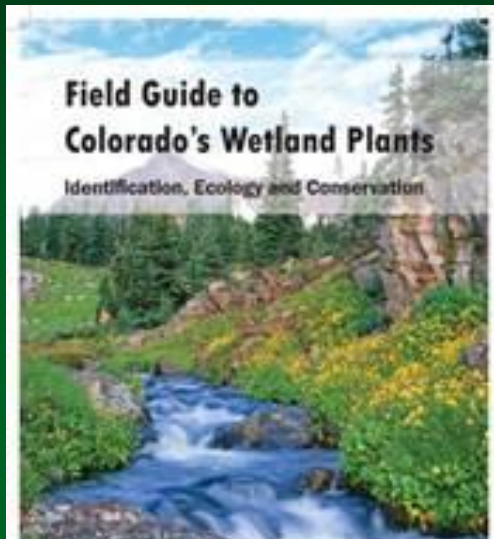
Vegetation Composition Comments: Very typical saline plays native species classes (species are not especially weedy). No non-native species observed.

Vegetation Structure Comments: Small clusters of Sarcobatus vermiculatus, w classes.

Hydrology Metrics	Weight	Field Rating	Field Points
HYD1. Water Source		A	400
HYD2. Hydroperiod		A	400
HYD3. Hydrologic Connectivity		A	400

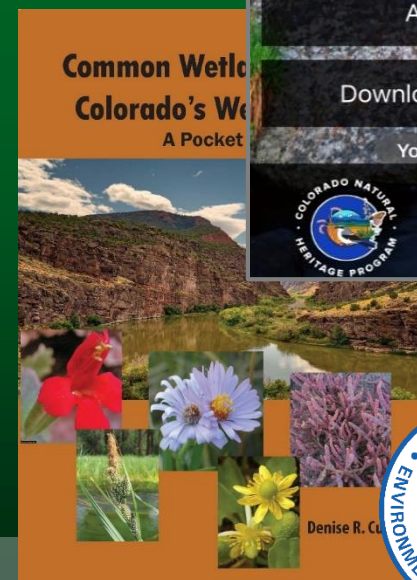
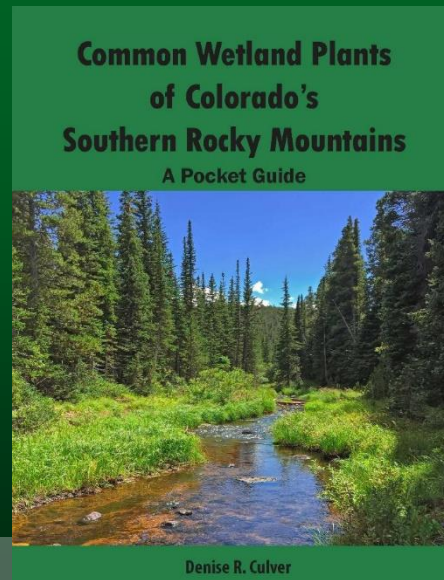
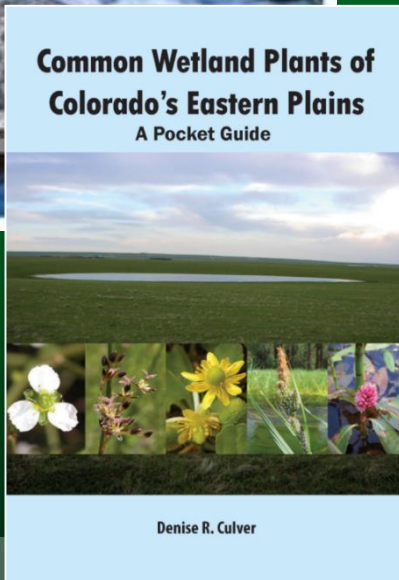
# Wetland Plant Identification

*What plants and animals depend on wetlands?*



## App Update Summer 2020! Exportable List of Favorites:

- Name with Synonyms
- USDA Plants Symbol
- Conservation Status
- Coefficient of Conservation Value
- Wetland Indicator Status





# Priority Wetland Wildlife Species

COLORADO PARKS & WILDLIFE

## Dabbling Ducks

ASSESSING HABITAT QUALITY FOR PRIORITY WILDLIFE SPECIES IN COLORADO WETLANDS



Several species are included in the Dabbling Duck guild. Top row from left: American widgeon (*Anas americana*), blue-winged teal (*A. discors*), cinnamon teal (*A. cyanoptera*). Second row from left: gadwall (*A. strepera*), green-winged teal (*A. crecca*), mallard (*A. platyrynchos*). Bottom (bottom) pintail (*A. cauta*).

### Species Description

**Preferred Habitats**  
The most important wetland habitats for dabbling ducks during spring and fall migration include beaver ponds, emergent marshes, warm water sloughs, moist sedge and herbaceous sedge wetlands.  
During winter, in freeze and ducks and water slough deep grassed sedge wetlands during the breeding season.

### Diet

Most dabbling ducks consume far more invertebrates during the breeding season compared with other times of year. During non-breeding seasons, the diet varies according to

### Species Distribution



### Preferred Habitat Conditions

Dominant vegetation	sedges, rushes, grasses, forbs, and aquatic vegetation
Diversity of plants desirable to ducks	abundant (desirable plants are often seed bearing species such as pondweeds, duck, sedges, and some grasses)
Emergent vegetation within open water	21- 50% for diurnal use 61- 80% for nocturnal use
Interspersion	complex patterns that maximize interface between water and vegetation
Landscape context	proximity to other wetlands on the landscape
Size of habitat	>20 acres for wet meadows >2 acres for other wetlands excluding reservoirs
Submergent vegetation	31-40%
Water depth (predominant)	6- 12 inches

### Management Recommendations

This fact sheet contains easy-to-use guidelines for understanding habitat needs of Colorado Parks and Wildlife priority wetland-dependent wildlife. A number of practical steps can be taken to improve habitat for dabbling ducks.

#### Hydrology

- Maintain water depths 4- 12 inches.
- Time drawdowns in summer to coincide with desired vegetation.
- Drawdown gradually for the greatest diversity of vegetation.
- Re-flood in late summer or early fall for wild migrants.

#### Vegetation

- Consider establishing submerged aquatic vegetation.
- Consider revegetating with native plants during drawdown if devoid of vegetation for long periods.
- Use disturbance techniques to set back succession.
- Control undesirable vegetation, especially noxious plants, exotics, and woody vegetation.
- Control woody vegetation at young age.
- Create 50:50 interspersion or huminal/marginal conditions (1:1 open water to emergent vegetation).
- Manage for diversity of native plants.
- Use drawdowns to accelerate decomposition.



Acknowledgments: Elizabeth A. Giesler, J. Emery, and W. L. S. reviews an earlier version of this production. For wetland photo credit: W. L. S. Giesler.

#### Suggested Reading and Citations

- Ashton, J. L., and R. L. R. 1995. Northern Pintail (*Anas platyrhynchos*) in Florida: North America's New 200. Great Lakes Science and Management Series No. 64. Center for Wetland Studies.
- Grassowley, J. L. 1999. Distribution of plant communities. The Birds of North America, No. 224. Cornell University Press.
- Johnson, K. 1995. Great winged teal (*Anas platyrhynchos*). The Birds of North America, No. 223. Cornell University Press.
- Johnson, K. R., J. M. K. and H. J. 1997. 1997. Wetland-dependent wildlife. The Birds of North America, No. 224. Cornell University Press.
- Johnson, K. R., J. M. K. and H. J. 1997. 1997. Wetland-dependent wildlife. The Birds of North America, No. 224. Cornell University Press.

### Habitat Scorecard for Dabbling Ducks (v. Jan 2016)

Assessment of habitat before and after restoration or management actions

Project Name: \_\_\_\_\_ Date(s) of Assessment: \_\_\_\_\_

Instructions: Select appropriate checklist: (1) Emergent Wetlands, Playas, and Impoundments, (2) Wet Meadows, or (3) Sandbars. Enter one value that best describes migratory (spring/fall) conditions of each habitat variable, using the numbers in the value column. Habitat variables are in shaded boxes; ranges of condition are directly below each variable. If condition is outside range or is not described, enter a zero.

#### Emergent Wetlands, Playas, and Impoundments

Key habitat variable and conditions	Value	Before	After
<b>Dominant vegetation</b>			
Sedges, rushes, grasses, forbs, and aquatic vegetation		18.7	
Resistant wetland herbs (cattail, bulrush, meadows, etc.)		12.5	
Open willows/shrubs. Closed canopy trees (>50% cover)		6.2	
<b>Percent of emergent vegetation within water</b>			
21 - 50%		18.7	
5 - 20%		12.5	
50 - 100%		6.2	
<b>Drawdown depth of water</b>			
4 - 12 inches		18.7	
>12 - 25 inches		12.5	
>25 - 40 inches		6.2	
<b>Percent submergent vegetation</b>			
>30 - 50%		17.8	
>10 - 30%		11.6	
0 - 10%		5.5	
<b>Interspersion</b>			
C or D		15.0	
B		10.0	
A or E		5.0	
Interspersion patterns refer to the above diagram (shaded = water, solid = vegetation)			
<b>Size of habitat</b>			
>2 acres		11.1	
>0.5 - 2 acres		7.5	
0.25 - 0.5 acres		3.7	

COLORADO PARKS & WILDLIFE

## Sandhill Crane

ASSESSING HABITAT QUALITY FOR PRIORITY WILDLIFE SPECIES IN COLORADO WETLANDS



Sandhill cranes (*Grus canadensis*, Family Gruidae) are impressive birds with a wide wingspan, red eye patch, and loud trumpet-like call.

### Species Description

**Identification**  
With a length of 36-40 feet and wingspan of 7-7.5m, sandhill cranes are hard to miss, but they are sometimes mistaken for great blue herons. Their general dancing, bobbing, and wading posture, white neck, and their wading or trumpeting calls are helpful for identification.

### Preferred Habitats

Sandhill cranes occupy various wetland habitats, including marshes, sloughs, and springs. They are most abundant in playas and meadows. They rely heavily on sedge wetlands and meadows.

**Diet**  
During migration, sandhill cranes depend on a wide range of forage, such as wheat, barley, and corn. Other food

items include snails, crayfish, insects, roots, and small vertebrates and waterfowl eggs.

**Conservation Status**  
There are several subspecies of sandhill crane. The greater sandhill crane (*G. c. sinuata*), listed as a "Species of Greatest Conservation Need in Colorado" (CPW 2015), winters primarily in New Mexico, with spring and fall stopovers in the San Luis Valley of Colorado. Greater sandhill cranes migrate through the eastern plains of Colorado.

### Species Distribution

**Range**  
Sandhill cranes breed in the northern and northwestern Colorado mountains, with a direct population in the



COLORADO PARKS & WILDLIFE

## Leopard Frogs

ASSESSING HABITAT QUALITY FOR PRIORITY WILDLIFE SPECIES IN COLORADO WETLANDS



Two species of leopard frogs occur in Colorado. Northern leopard frogs (*Rana pipiens*) primarily inhabit green wetlands, while western leopard frogs (*R. sierrae*) inhabit riparian

### Species Description

**Identification**  
The leopard frog is included in the green leopard frog (*R. pipiens*) and plains leopard frog (*R. sierrae*). They are similar in appearance, but the western leopard frog has a more mottled pattern on its back.

### Preferred Habitats

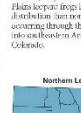
Due to their complex life history, leopard frogs occupy many habitats during different seasons and stages of develop-

**Diet**  
Adult leopard frogs primarily eat insects and other invertebrates, including crickets, beetles, and worms, as well as small vertebrates, such as other amphibians, snakes, lizards, and birds. They are also known to eat small fish and tadpoles of other frogs.

**Conservation Status**  
Northern leopard frog populations have declined throughout their range. They are listed as a "Species of Greatest Conservation Need" in Colorado.

### Species Distribution

**Range**  
Northern leopard frogs are found in the northern and northwestern Colorado mountains, with a direct population in the



COLORADO PARKS & WILDLIFE

## Preble's Meadow Jumping Mouse

ASSESSING HABITAT QUALITY FOR PRIORITY WILDLIFE SPECIES IN COLORADO WETLANDS



Preble's meadow jumping mouse (*Zapus leucurus* family Dipodidae) are a small mammal that lives in dense riparian vegetation along the Front Range.

### Species Description

**Identification**  
Preble's meadow jumping mice grow to approximately 100 mm in length, including the ears and a half-inch tail. They are mostly nocturnal and are known to be active at night.

### Preferred Habitats

During warmer months, the most important wetland types occurred

### Species Distribution

**Range**  
Preble's meadow jumping mouse is found in the Front Range of Colorado, primarily along the Front Range from the Wyoming-Front Range County.



### Species Description

**Diet**  
The diet of Preble's meadow jumping mouse includes grass seeds, invertebrates, fungi, and insect larvae.

**Conservation Status**  
The Preble's meadow jumping mouse is listed as a "Species of Greatest Conservation Need" in Colorado. They are listed as a "Species of Greatest Conservation Need" in Colorado (CPW 2015). The Colorado Native Heritage Program

COLORADO PARKS & WILDLIFE

## Arkansas Darter

ASSESSING HABITAT QUALITY FOR PRIORITY WILDLIFE SPECIES IN COLORADO WETLANDS



Arkansas Darters (*Etheostoma caeruleum*) are a small native fish of the Colorado plains. They have spots and stripes on their sides.

### Species Description

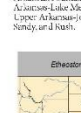
**Identification**  
Arkansas darters are 75- to 85-mm fish belonging to the perch family. During April to May, the belly of breeding males changes from white to bright orange.

### Preferred Habitats

Arkansas darters inhabit spring-fed streams, stream channels, and pools with vegetation, often with undercut

### Species Distribution

**Range**  
Arkansas darters occur only in parts of Arkansas, Colorado, Kansas, Missouri, and Oklahoma. In Colorado, they are known from eight drainages within the Arkansas River Basin Upper Arkansas Program, Upper Arkansas-Arkansas-Lake Meredith, Lower Arkansas-Arkansas-Martin, the Ninety, and Kaw.



### Species Description

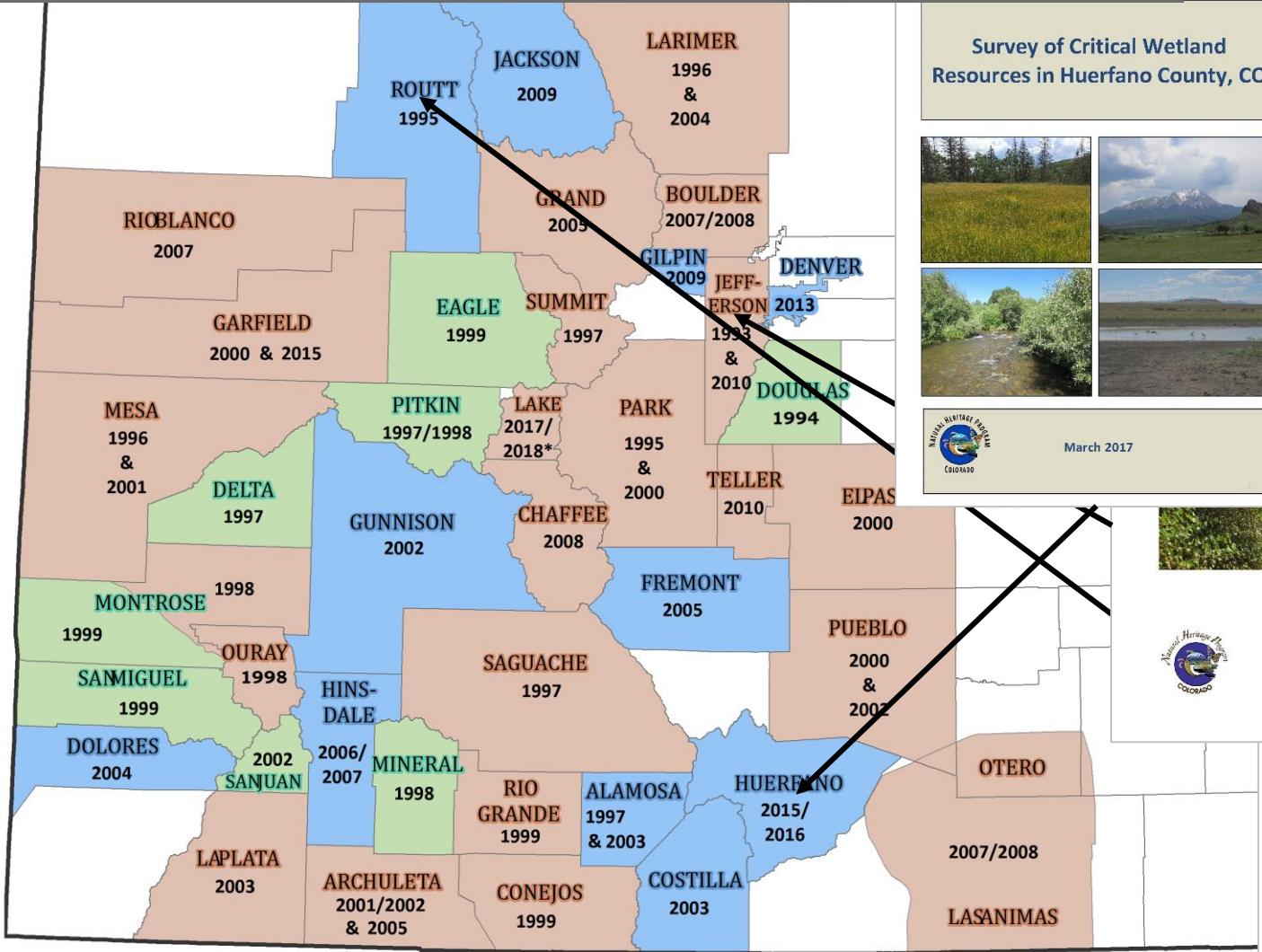
**Conservation Status**  
Arkansas darters appear on several lists of concern. Recent candidate species (C-28) and Wildlife Species of Greatest Conservation Need (CPW 2015), and are listed on the International Union for Conservation of Nature's (IUCN) Red List of Threatened Species. Plans on a landscape-level assessment are needed for the species to move between or among wetlands.

<http://cpw.state.co.us/aboutus/Pages/WetlandsPrioritySpecies.aspx>



# County Surveys for Critical Wetlands

Which wetlands are most significant for conserving biodiversity?



## Survey of Critical Wetland Resources in Huerfano County, CO



March 2017

## Biological Resources County, Colorado 2010-2011



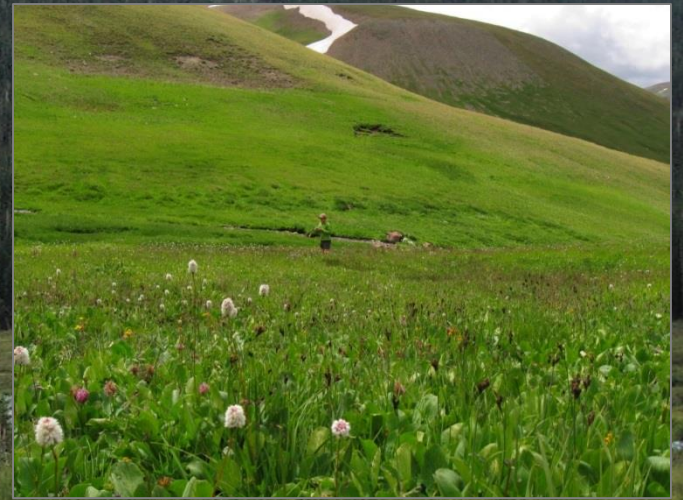
Report Submitted to:  
the Colorado Department of Natural Resources  
December 1996

Prepared by:  
Dennis Culver, Assistant Wetland Ecologist  
John Sanderson, Wetland Ecologist

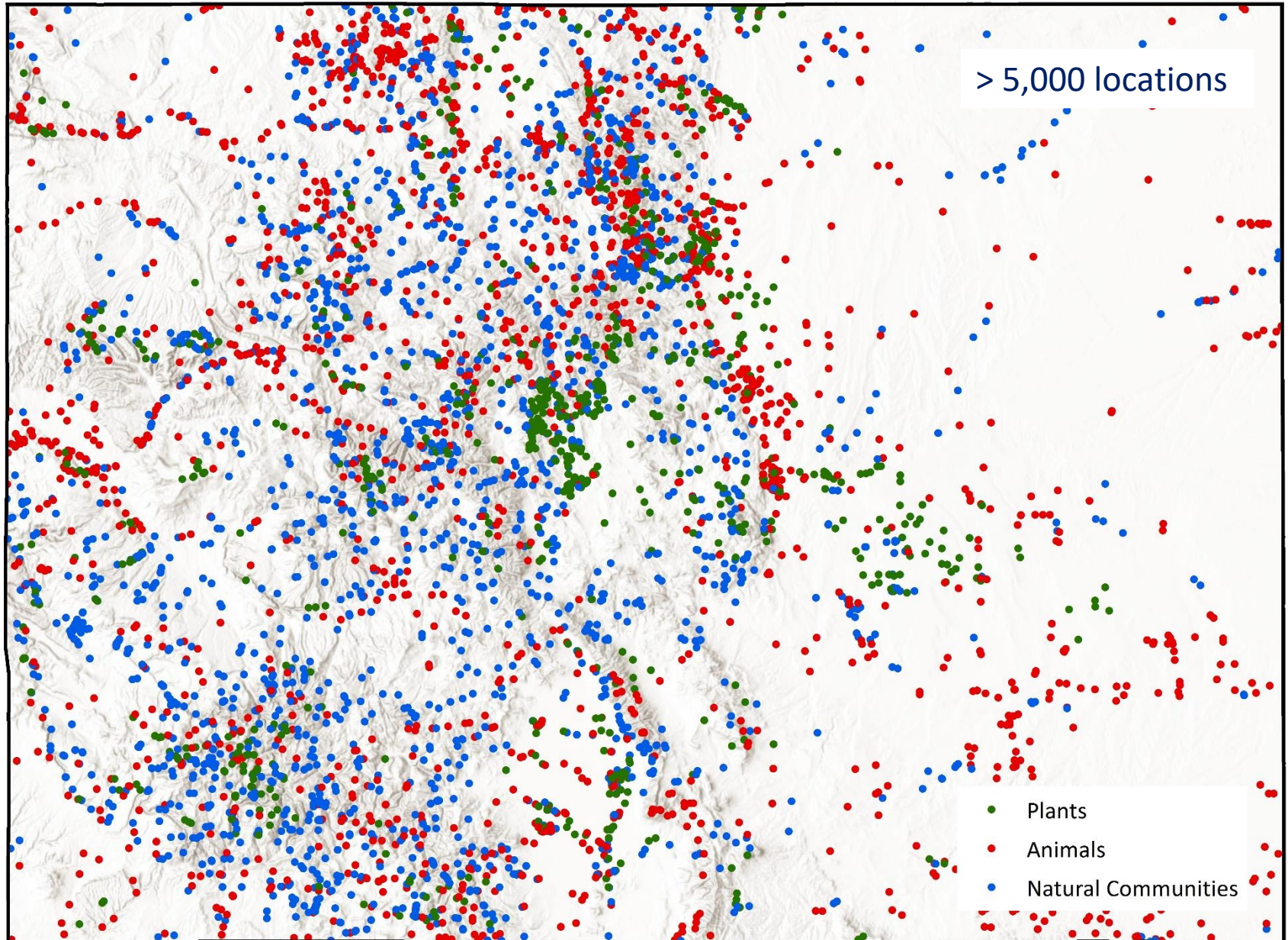
The Colorado Natural Heritage Program  
General Services Building Room 254  
Colorado State University  
Fort Collins, CO 80523



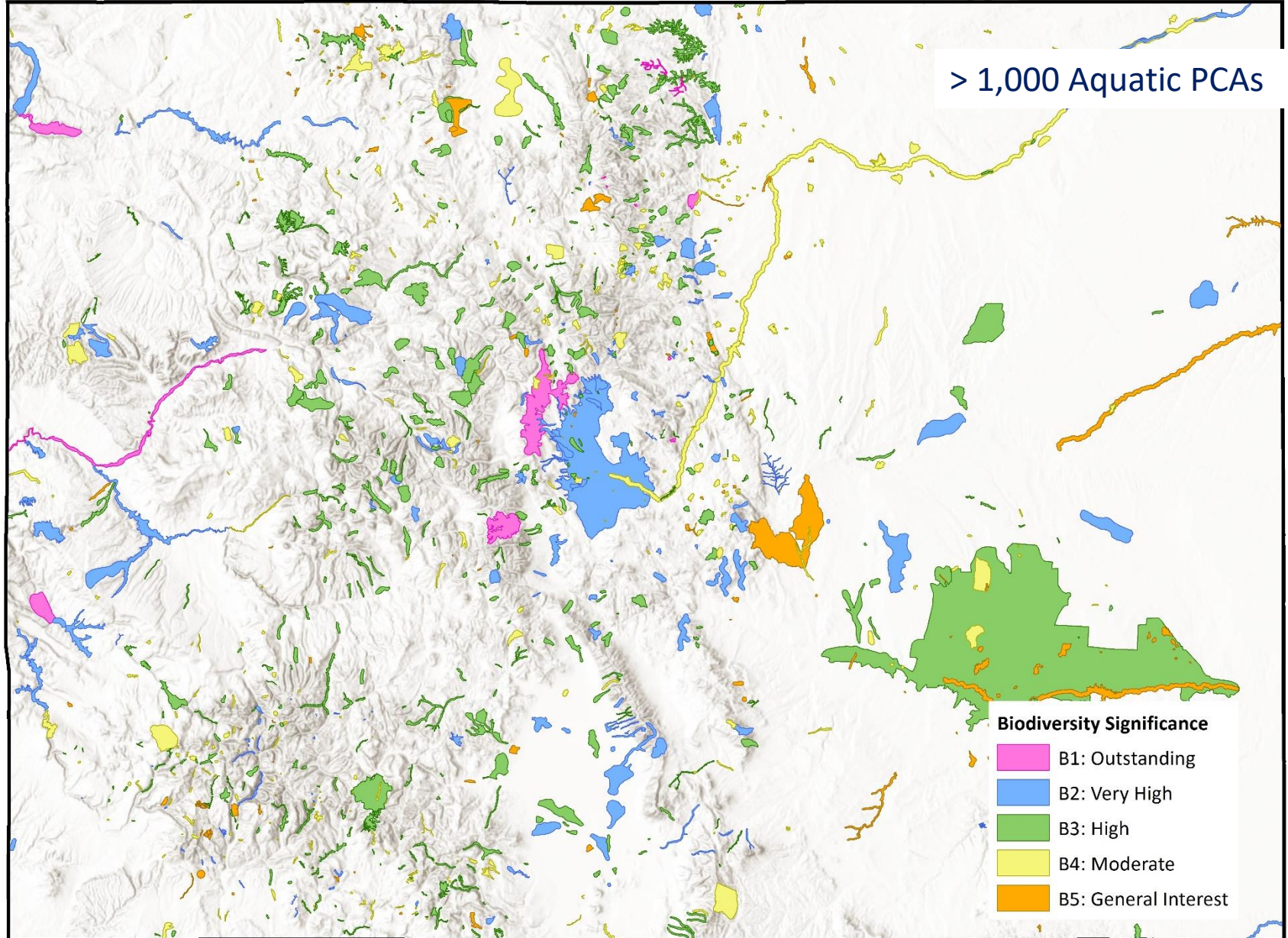




# Wetlands Element Occurrences



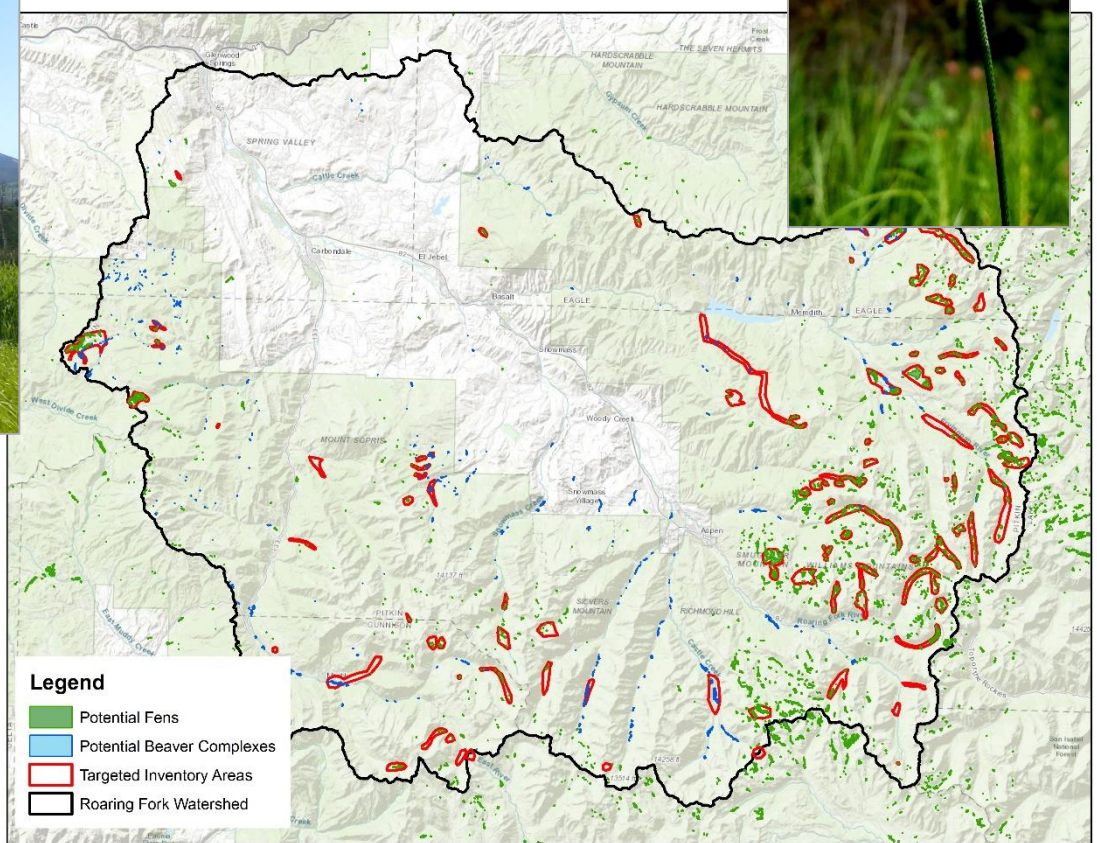
# Wetland Potential Conservation Areas



# Wetlands of the Roaring Fork Watershed

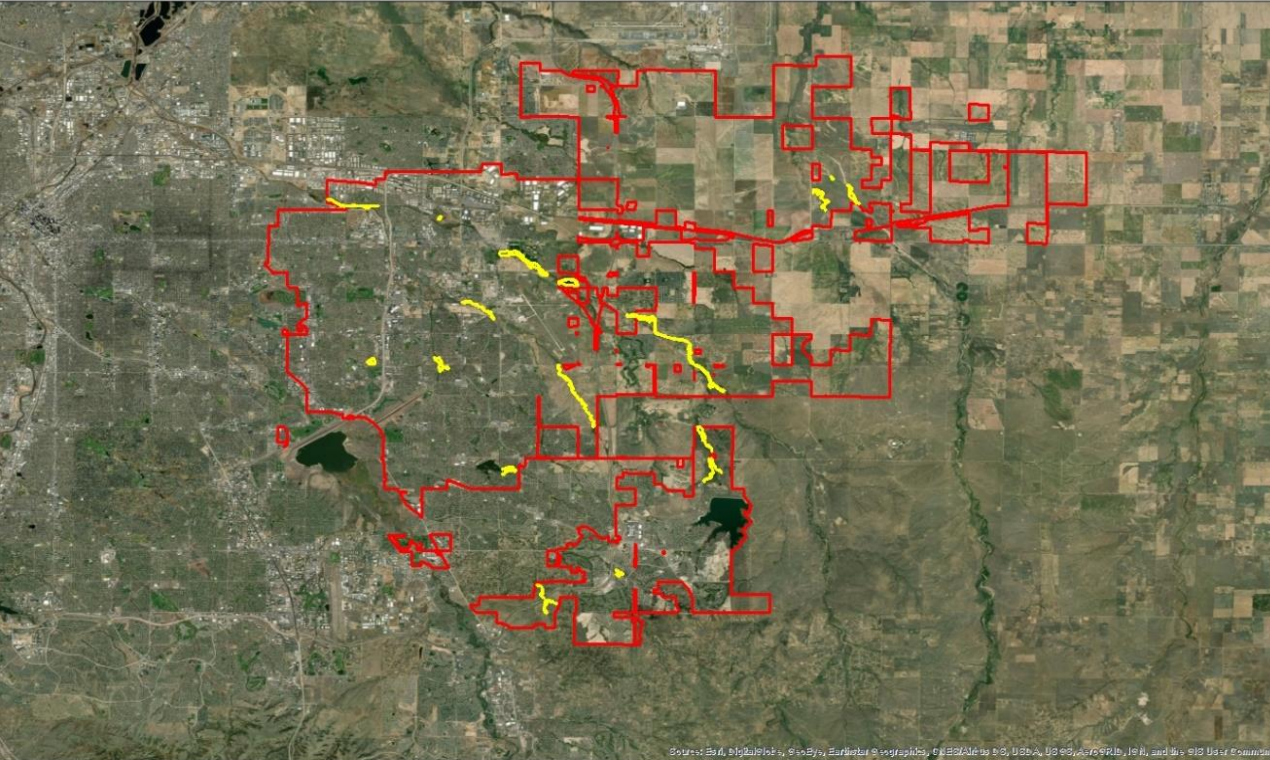
Watershed-scale survey and assessment of wetlands

- Access granted by numerous large landowners has allowed for an assessment of wetlands from Snowmass to Glenwood Springs
- Reviewing and updating EORs for both wetlands and uplands
- Will identify watershed scale conservation and restoration priorities



# Critical Wetlands Survey for Aurora

City of Aurora - Critical Wetlands Survey



Urban wetland surveys provide data on public wetland resources to inform management priorities and conservation and restoration planning, such as:

- rare and conservation-priority wetland species
- areas of degradation
- the condition and functional status of a city's public wetlands



# CNHP's EIA Manual and User Resources



How are our wetlands doing? What condition are they in?

## Ecological Integrity Assessment for Colorado Wetlands Field Manual, Version 2.1



March 2016

Colorado

Site ID / Name: \_\_\_\_\_ Date: \_\_\_\_\_

**2015 COLORADO WETLAND ECOLOGICAL INTEGRITY ASSESSMENT (EIA) – METRICS**

LANDSCAPE METRICS		
<b>L1. CONTIGUOUS NATURAL LAND COVER</b>	<b>L2. LAND USE INDEX</b>	
Select the statement that best describes the <b>contiguous natural land cover</b> within the 500 m envelope surrounding the AA. See list of natural land covers in the field manual.	Select the statement that best describes the intensity of surrounding land use. Use the Land Use Index Worksheet (last page) to calculate the Land Use Index score.	
intact: AA embedded in 90–100% contiguous natural land cover.	A Land Use Index = 9.0–10.0	A
Variegated: AA embedded in 60–90% contiguous natural land cover.	B Land Use Index = 8.0–9.4	B
Fragmented: AA embedded in 20–60% contiguous natural land cover.	C Land Use Index = 4.0–7.9	C
Relictual: AA embedded within <20% contiguous natural land cover.	D Land Use Index = <4.0	D

Landscape comments:

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**BUFFER**

<b>B1. PERIMETER WITH NATURAL BUFFER</b>	
Select the statement that best describes the <b>perimeter of the AA with natural buffer</b> . Buffer land covers must be 5 m wide and extend along ± 10 m of the AA perimeter. See list of buffer land covers in the field manual.	
Natural buffer surrounds 100% of the AA perimeter.	A
Natural buffer surrounds 75–99% of the AA perimeter.	B
Natural buffer surrounds 25–74% of the AA perimeter.	C
Natural buffer surrounds <25% of the AA perimeter.	D

<b>B3. CONDITION OF NATURAL BUFFER</b>	
Select the statement that best describes the <b>natural buffer condition</b> . See metrics above. Remember to look for <b>non-native hog grasses</b> .	
Abundant (≥95%) relative cover of native vegetation and little or no (<5%) cover of non-native plants.	A
Substantial (75–95%) relative cover of native vegetation and low (5–25%) cover of non-native plants.	B
Low (25–75%) relative cover of native vegetation and moderate to substantial (25–75%) cover of non-native plants.	C
Very low (<25%) relative cover of native vegetation and dominant (>75% cover) of non-native plants OR no buffer exists.	D

Buffer comments:

2015 Colorado Wetland EIA Field Form – September 4, 2015

Site ID / Name: \_\_\_\_\_ Date: \_\_\_\_\_

**VEGETATION COMPOSITION METRICS**

<b>V1. NATIVE PLANT SPECIES COVER (RELATIVE)</b>	<b>V2. INVASIVE NONNATIVE PLANT SPECIES COVER (ABSOLUTE)</b>	
Select the statement that best describes the <b>relative cover of native plant species</b> within the AA.	Select the statement that best describes the <b>absolute cover of invasive nonnative plant species</b> within the AA. Use list provided in the manual.	
AA contains ≥99% relative cover of native plant species.	A Invasive nonnative species are absent from all strata.	A
AA contains 95–99% relative cover of native plant species.	B Invasive species present, but sporadic (<1% absolute cover).	B
AA contains 85–95% relative cover of native plant species.	C Noxious weeds somewhat abundant (4–10% cover).	C
AA contains 60–85% relative cover of native plant species.	D Noxious weeds abundant (10–30% cover).	D
AA contains <60% relative cover of native plant species.	D Noxious weed very abundant (>30% cover).	D

Select the statement that best describes the **native plant species composition** (species abundance and diversity) within the AA. Look for native species diagnostic of the system vs. native increasers that may thrive in human disturbance.

Native plant species composition with expected natural conditions: i) Typical range of native diagnostic species present, AND ii) Native species sensitive to anthropogenic degradation are present, AND iii) Native species indicative of anthropogenic disturbance (i.e., increasers, weeds or ruderal species) absent to minor.	A
Native plant species composition with minor disturbed conditions: i) Some native diagnostic species absent or substantially reduced in abundance, OR ii) Native species indicative of anthropogenic disturbance are present with low cover.	B
Native plant species composition with moderately disturbed conditions: i) Many native diagnostic species absent or substantially reduced in abundance, OR ii) Native species indicative of anthropogenic disturbance are present with moderate cover.	C
Native plant species composition with severely disturbed conditions: i) Most or all native diagnostic species absent, a few remain in low cover, OR ii) Native species indicative of anthropogenic disturbance are present with high cover.	D

Vegetation composition comments:

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**VEGETATION STRUCTURE METRICS**

<b>V4. VEGETATION STRUCTURE (VERTICAL AND HORIZONTAL)</b>		
Select the statement below that best describes the overall vertical and horizontal structure within the AA. Vertical structure relates to the number of vertical vegetation strata. Horizontal structure relates to the number and complexity of biotic and abiotic patches within the wetland/riparian area. See reference card for potential structural patches. Assess each site based on the expected condition within its Ecological System type. For woody systems, trace regeneration and woody debris individually on next page, then consider those ratings in the overall assessment of structure.		
<b>Herbaceous systems: Marsh, Meadow, Playa</b>	<b>Woody systems: Riparian and Floodplain</b>	
<b>General:</b> Vegetation structure is at or near minimally disturbed natural conditions. Little to no structural indicators of degradation evident.		
Structural patches/zones are appropriate in number and type for the system (e.g., few in playas, ferns, meadows). There is diversity in vertical strata within the herbaceous vegetation (some tall and some short layers and/or low cover of shrubs or trees, where appropriate). Litter and other organic inputs are typical of the system (i.e., playas should have low litter while meadows and marshes should have moderate amounts of litter).	AA is characterized by a complex array of nested or interspersed patches. Canopy (if present) contains a mosaic of different ages or sizes, including large old trees and obvious regeneration. Number of live stems is well within expected range. Shrub and herbaceous layers are complex, providing a diversity of vertical strata. Woody species are of sufficient size and density to provide future woody debris to stream or floodplain. Litter layer is neither lacking nor extensive.	A

2015 Colorado Wetland EIA Field Form – September 4, 2015

EIA Metrics – Page 2

<http://www.cnhp.colostate.edu/cwic/assessment/methods.asp#Level2>

# BLM Stream and Wetland Monitoring

## BLM's Assessment Inventory and Monitoring (AIM) Program



*The goal of the Assessment, Inventory, and Monitoring Strategy (AIM) is to reach across programs, jurisdictions, stakeholders, and agencies to provide standardized information to inform management decisions.*

Standardized methods and structured implementation for three resources:

- *Terrestrial AIM for uplands*
- *Lotic AIM for rivers and streams*
- *Lentic AIM for wetlands and riparian areas*

CNHP coordinates BLM stream sampling in Utah and parts of Colorado and Wyoming



# BLM Stream and Wetland Monitoring

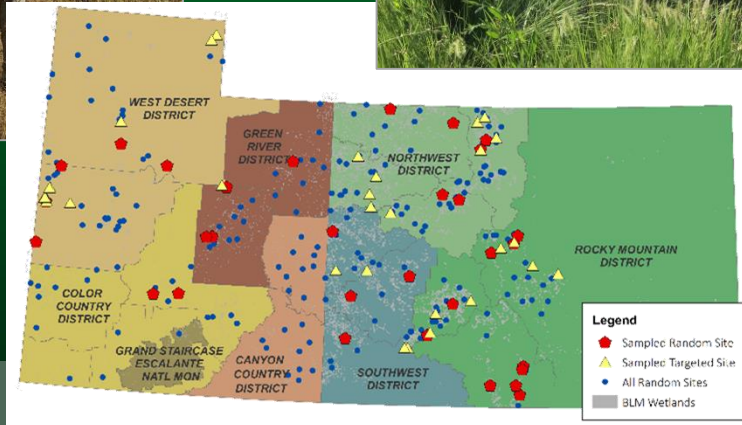
## BLM's Assessment Inventory and Monitoring (AIM) Program

CNHP is a major contributor to new Lentic AIM for wetlands and riparian areas.

- Helped develop the field manual
- Lead a pilot effort in 2019
- Expanding to six states in 2020



Monitoring Framework:  
Monitoring Methods



Technical Reference 1735-x  
April 2018





# Watershed Planning Toolbox

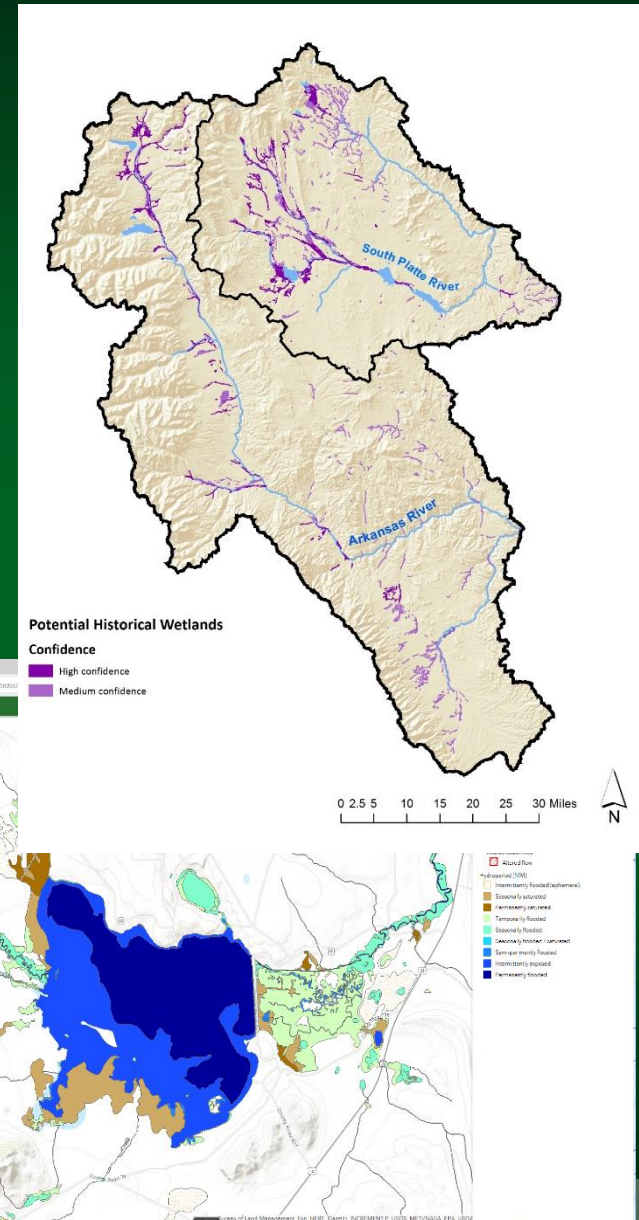
*Where are the best opportunities for restoration?*

## Online mapper focused on the Arkansas and South Platte Headwaters watersheds

- Arkansas and South Platte Headwaters watersheds
- More than 80 data layers
- Wetland types and attributes
- Wetland functions
- Stressors
- Prioritized restoration and conservation areas

## Working in Wetlands web pages:

- gateway to data and resources
- funding opportunities to technical guidance
- Best Management Practices (BMPs) for wetlands



# Beaver Models and Restoration Database

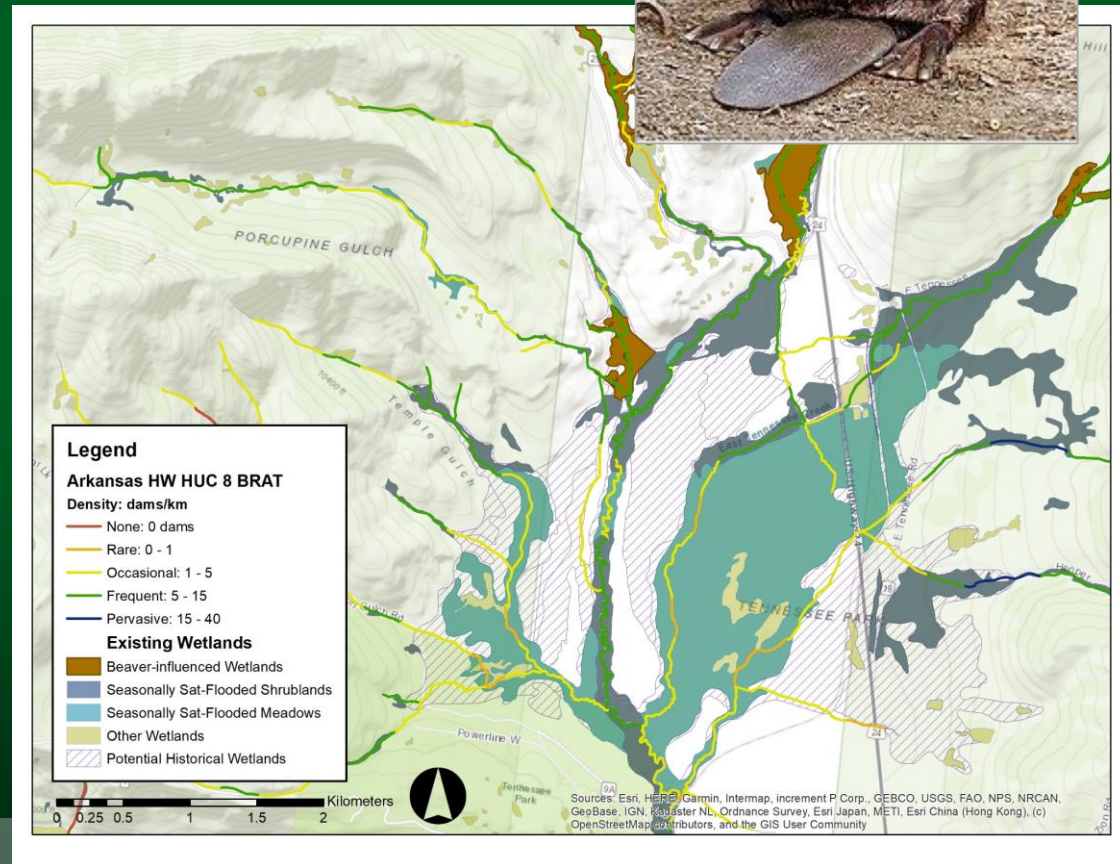
## Park County Beaver Restoration Study

- Exploring opportunities for process-based floodplain reconnection using the Beaver Restoration Analysis Tool, updated wetland mapping, and on-the-ground field data
- Priority areas will be shared in the Watershed Planning Toolbox mapper



## Wetland and Riparian Restoration Database

- Allow practitioners to share and view restoration project goals, lessons learned, and other project information in a database and in the Watershed Planning Toolbox mapper



# Multi-Agency Wetland Program Plan



# Wetland Team Members



**Sarah Marshall, Ecohydrologist**

- Wetland restoration
- Wetland functions and services
- Landscape analysis of watershed priorities
- Wetland botany, hydrology, and soils



**Laurie Gilligan, Wetland Ecologist**

- Wetland condition/function assessment
- Front Range and Eastern Plains wetlands
- Watershed and wetland research
- Wetland botany

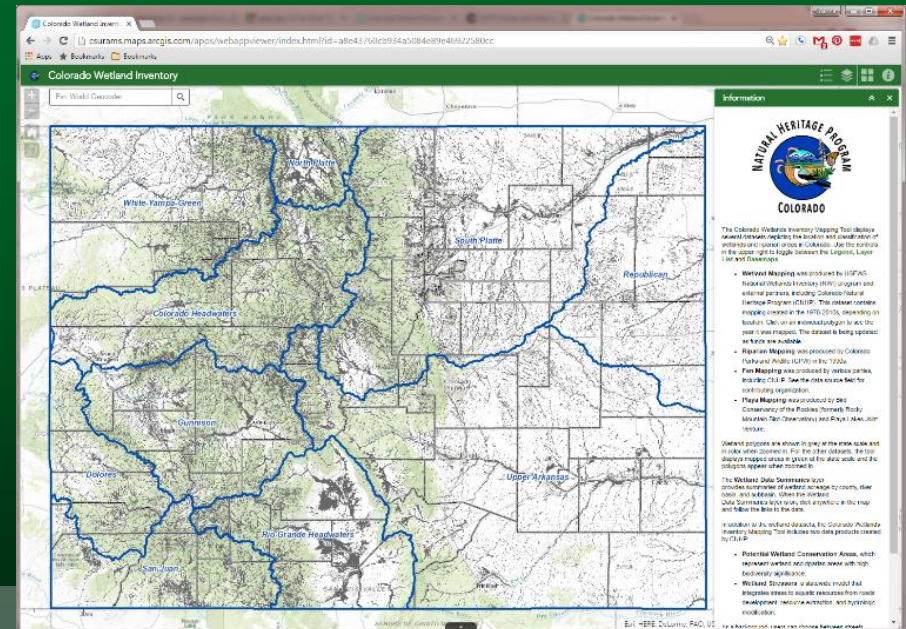


# Wetland Team Members



## Gabrielle Smith, GIS Analyst and Wetland Mapping Specialist

- Fen mapping for U.S. Forest Service
- National Wetland Inventory (NWI) mapping
- GIS Analysis and Support for CNHP projects
- Web services for the Colorado Wetland Inventory Tool and the Watershed Restoration Toolbox



# Wetland Team Members



**Tess Webb, Aquatic Ecologist**

Based in Salt Lake City, UT

- BLM stream monitoring
- BLM wetland monitoring
- GIS mapping and data development
- Data collection app development



**Janet Miller, Aquatic Ecologist**

- BLM stream monitoring
- Aquatic macro-invertebrates
- Ecotoxicology and water quality
- Data analysis and modeling



# Wetland Team Members



## **Ruth Whittington, Wetland Ecology RA**

Based in Boise, ID for 2020

- Wetland and riparian monitoring
- BLM wetland monitoring
- Wetland soils
- Wetland data analysis and sample designs



## **Katrina Castro, Aquatic Ecology RA**

Based in Salt Lake City, UT

- Wetland and riparian monitoring
- BLM wetland monitoring
- BLM stream monitoring
- Fen mapping in the Ashley National Forest



# Questions?

Joanna Lemly, Wetland Ecologist  
Colorado Natural Heritage Program  
Colorado State University  
(970) 491-2127

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