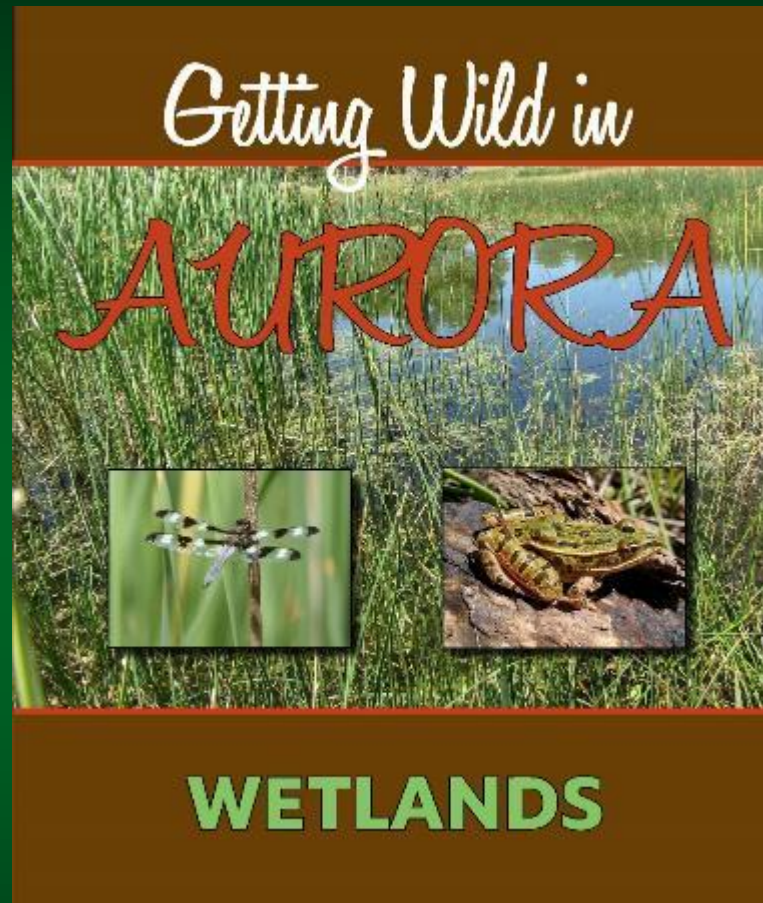


CNHP Urban Wetland Assessments: City of Aurora Case Study



Laurie Gilligan, Georgia Doyle,
Brad Lambert, Gabrielle Smith,
Lee Grunau, and Jill Handwerk.

www.cnhp.colostate.edu



WARNER COLLEGE OF
Natural Resources

Colorado State University

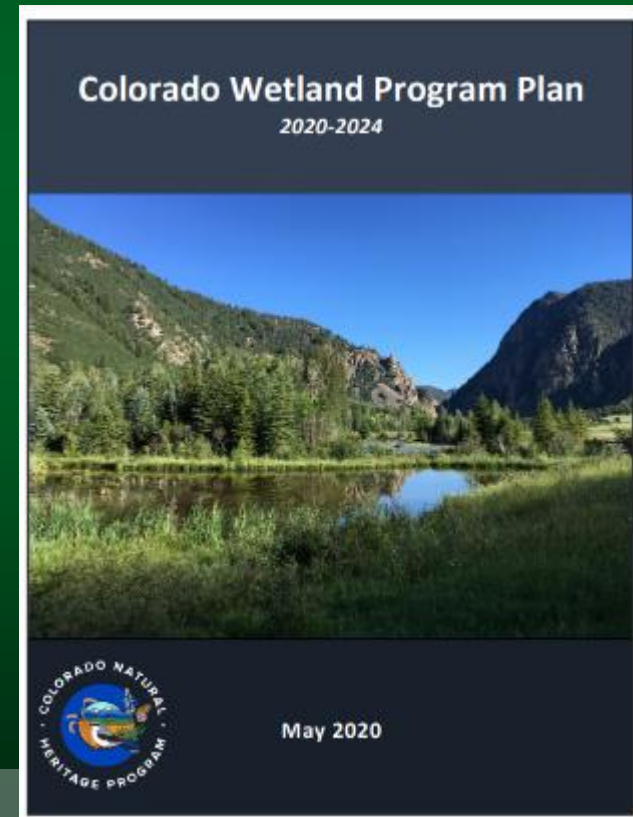
CNHP's Role in CO Wetlands

CNHP Mission:

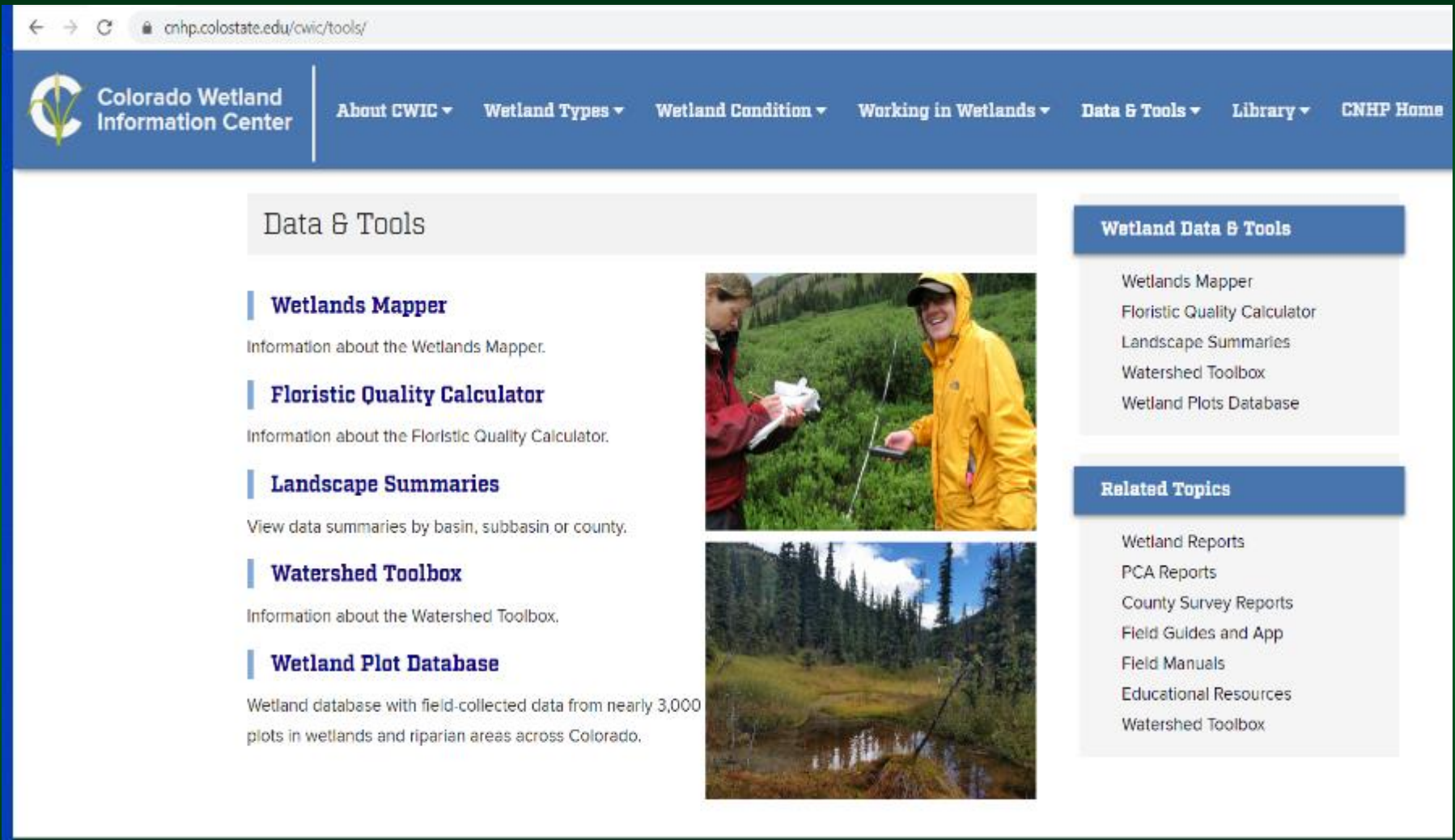
Advance the conservation of Colorado's native species and ecosystems through science, planning, and education for the benefit of current and future generations.

2020 Colorado Wetland Program Plan

- Many agencies and organizations do wetland protection, research, regulation, and management
 - CPW, CDOT, CDPHE, ACOE, EPA, CNHP, others
- Urban wetlands are on their own
 - Yet experience the most loss
- CNHP Colorado Wetland Information Center (CWIC)



Colorado Wetland Information Center



The screenshot shows the Colorado Wetland Information Center website. The browser address bar displays cnhp.colostate.edu/cwic/tools/. The navigation menu includes: Colorado Wetland Information Center, About CWIC, Wetland Types, Wetland Condition, Working in Wetlands, Data & Tools, Library, and CNHP Home.

Data & Tools



- Wetlands Mapper**
Information about the Wetlands Mapper.
- Floristic Quality Calculator**
Information about the Floristic Quality Calculator.
- Landscape Summaries**
View data summaries by basin, subbasin or county.
- Watershed Toolbox**
Information about the Watershed Toolbox.
- Wetland Plot Database**
Wetland database with field-collected data from nearly 3,000 plots in wetlands and riparian areas across Colorado.

Wetland Data & Tools

- Wetlands Mapper
- Floristic Quality Calculator
- Landscape Summaries
- Watershed Toolbox
- Wetland Plots Database

Related Topics

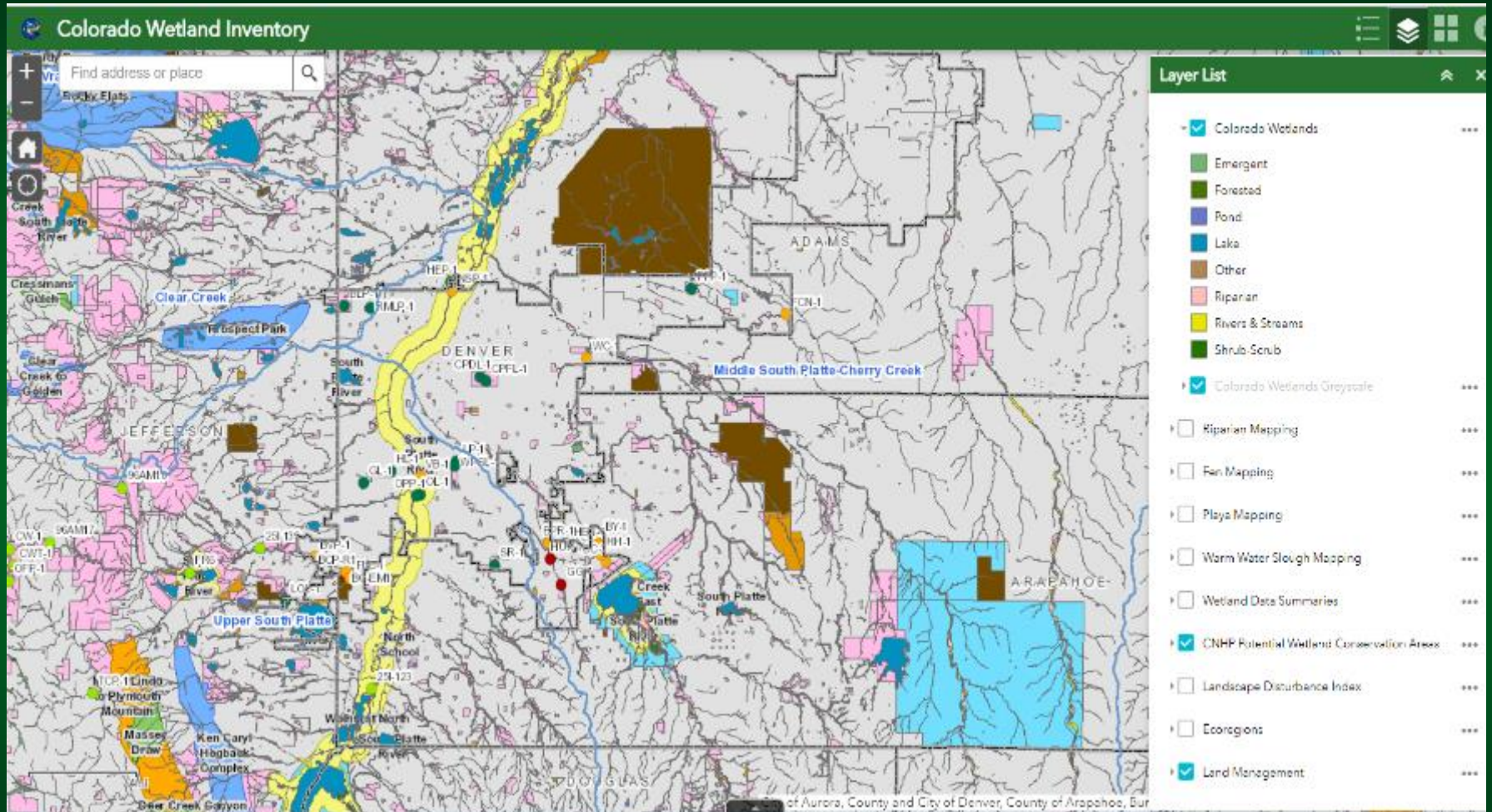
- Wetland Reports
- PCA Reports
- County Survey Reports
- Field Guides and App
- Field Manuals
- Educational Resources
- Watershed Toolbox



CWIC website: <https://cnhp.colostate.edu/cwic/>



Wetlands Mapper



<https://cnhp.colostate.edu/cwic/tools/mapper/>



Wetlands Mapper

The screenshot displays the Colorado Wetland Inventory web application. The interface includes a search bar at the top left with the text "Find address or place" and a search icon. The main map area shows a detailed view of wetlands in the Denver area, with a large inset map on the left providing a broader regional context. The inset map shows the Colorado Wetland Inventory map with various wetland types color-coded. The main map shows a detailed view of the wetlands, including the Platte-Cherry Creek, Senac Creek, and the Peter Seney Water Purification Facility. The map is overlaid with a grid and labels for various locations, including "Section 4 Athletic Field Complex", "E. Quincy Ave", "S. Floodscales Way", "Platte-Cherry Creek", "Senac Creek", "Peter Seney Water Purification Facility", "Upper S", "NCP Lindero", "Phinney Mountain", "Massey Draw", "Ken Cary Hogback Complex", "Clear Creek", "Cressman's Gulch", "Clear Creek to Golden", "Upper S", "NCP Lindero", "Phinney Mountain", "Massey Draw", "Ken Cary Hogback Complex", "Clear Creek", "Cressman's Gulch", "Clear Creek to Golden", "Upper S", "NCP Lindero", "Phinney Mountain", "Massey Draw", "Ken Cary Hogback Complex".

On the right side, there is a "Layer List" panel with the following layers:

- Colorado Wetlands
- Emergent
- Forested
- Pond
- Lake
- Other
- Riparian
- Rivers & Streams
- Shrub-Scrub
- Colorado Wetlands Greyscale
- Riparian Mapping
- Fen Mapping
- Playa Mapping
- Warm Water Slough Mapping
- Wetland Data Summaries
- CNHP Potential Wetland Conservation Areas
- Landscape Disturbance Index
- Ecoregions
- Land Management



Aurora Urban Wetlands Study Goals

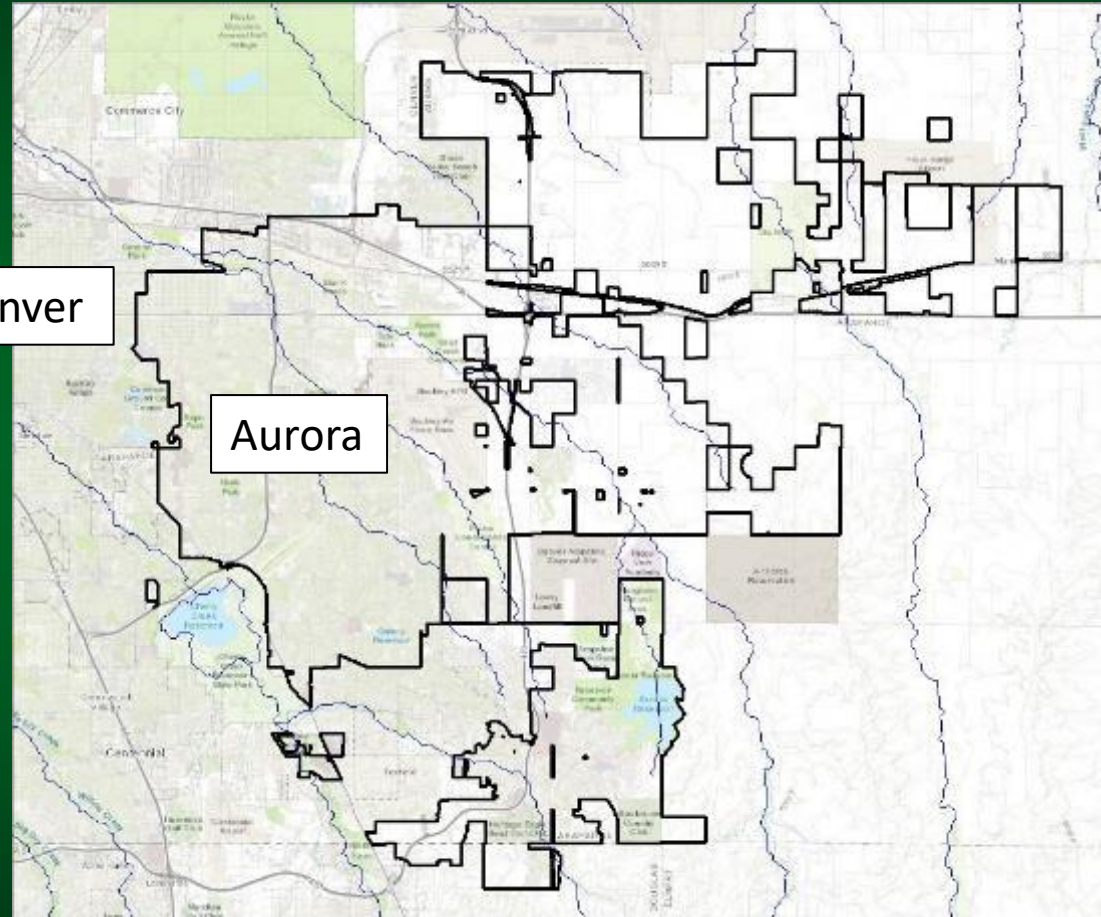
Provide current data on:

City of Aurora wetlands

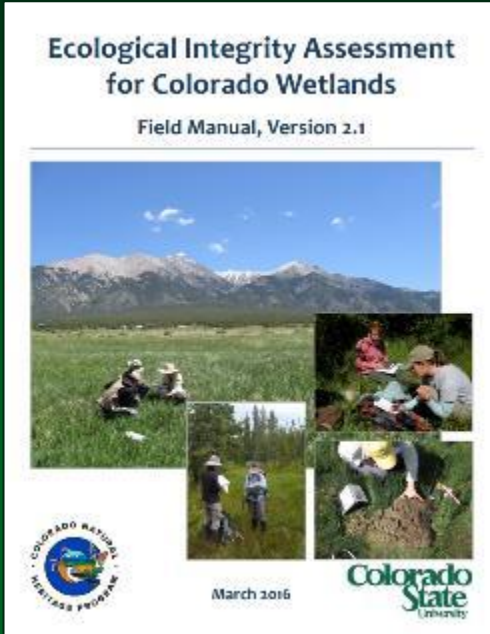
- Location
- Acres
- Type
- Critical wetland surveys
- Condition
- Values

Timeline:

2019-2021



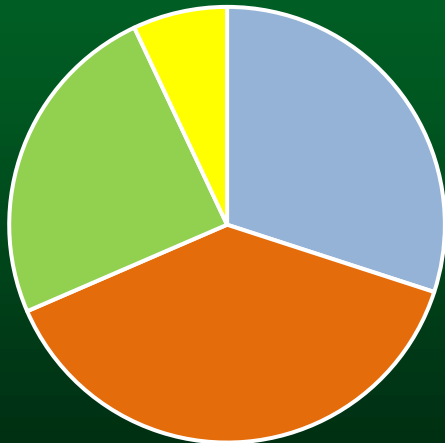
Wetland Assessment Methods: Condition



EIA Metrics (Lemly et al. 2016)

- Landscape and Buffer
- Vegetation Composition and Structure
- Hydrology Source, Hydroperiod, and Connectivity
- Substrate and Water Condition

EIA Metric Roll-up



- Landscape Context
- Condition - Vegetation
- Condition - Hydro/Geomorph
- Condition - Soil/WQ

Urban EIA Rank Interpretation

A: Uncommon and awesome!

B: High conservation value -

Important native habitat support

C: Candidates for targeted restoration

D: Trajectories of concern



Wetland Assessment Methods: Social

Social Rating

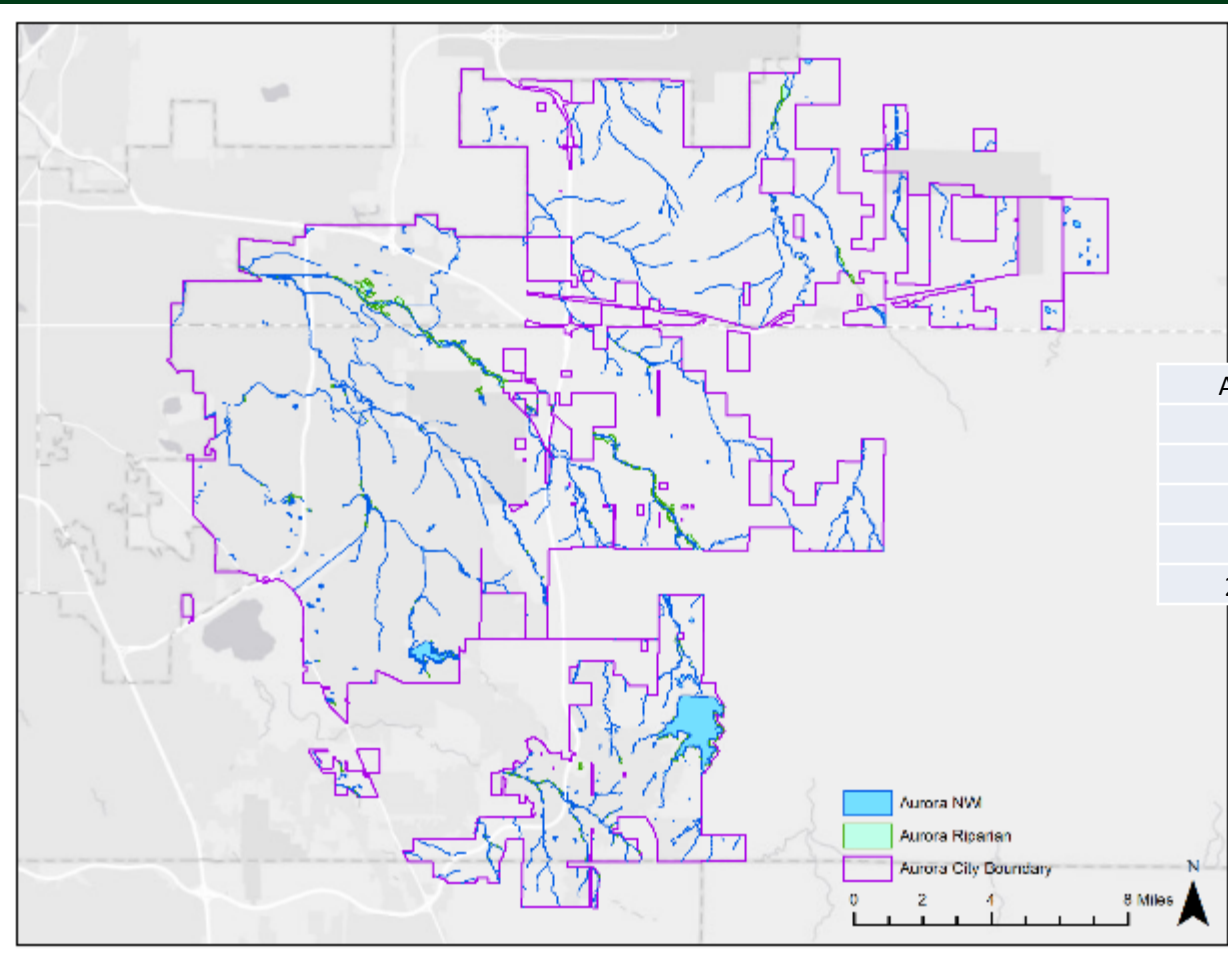
- Human-wetland interaction benefits

12 Point Additive Scale:

- Visitation/public access
- Population density near
- Impervious surface near
- Recreation amenities
- Education amenities
- Size



Results: NWI Mapping



| Acres | |
|--------------------------------|-----|
| 867 Lakes & Reservoirs | 34% |
| 690 Riparian Areas | 27% |
| 680 Vegetated Wetlands & Ponds | 26% |
| 331 Rivers, Streams & Canals | 13% |
| 2568 | |

<https://www.fws.gov/wetlands/Data/State-Downloads.html>



Targeted Wetland EIA Surveys

20 Targeted Wetland Assessment Areas (AAs)

- Rapid Surveys
- City Natural Area Boundary
- AA in one wetland ecological system at AA scale
 - 8 Western North American **Emergent Marsh**
 - 12 Western Great **Plains Riparian**
- Wet meadow patches within site have high protection value



Wetlands Ranks and Scores

EIA Scores

- Mostly C's + D's.
- Riparian sites rated > depressional marshes

Size – Area/Length – mostly B's.

- ID's conservation value together with EIA score

Social Rating

- ~Half high to very high.
- Med-low ratings in less developed areas



Vegetation

Common Plants:

- Characterized their wetland plant communities
- Smooth brome, cattail, willows, milkweed, Canada thistle, cottonwood

Invasives:

- Noxious weeds, and cattail and reed canary grass

Native and Conservative species: C-Value Analysis

- Conserve native plant zones, and C-values 5+
 - Sedge/rush patches, wet meadow forbs



Targeted Wildlife Inventory

Northern Leopard Frog

Tier 1 Species of State Conservation Concern

- Found breeding at 4 sites/ 2 natural areas

Threats

Chytrid fungus in 1 natural area.

Bullfrogs at 8 sites including chytrid-free site

These frogs were found at lower use sites, including the B site.



Trends in Wetland Gems

Beaver, Pollinators, and Native Plant Patches

- Provide valuable habitat and wetland function even in stressed wetlands

Riparian length and wetland/riparian resource size



Trends in Degradation

Development, Floodplain Land Use, and Stormwater

- Avoid fill/trails in wetland, and development near wetland/riparian

Changes in hydrology and wetland structure

- Monitor
- Improve connectivity
- Buffer development with green infrastructure



Historical Aerial Review



Historical aerials show wetland change over time.

- Wet meadow conversion to marsh
- Downcut narrowed stream
- Increased weeds in buffer



1956

Google Earth



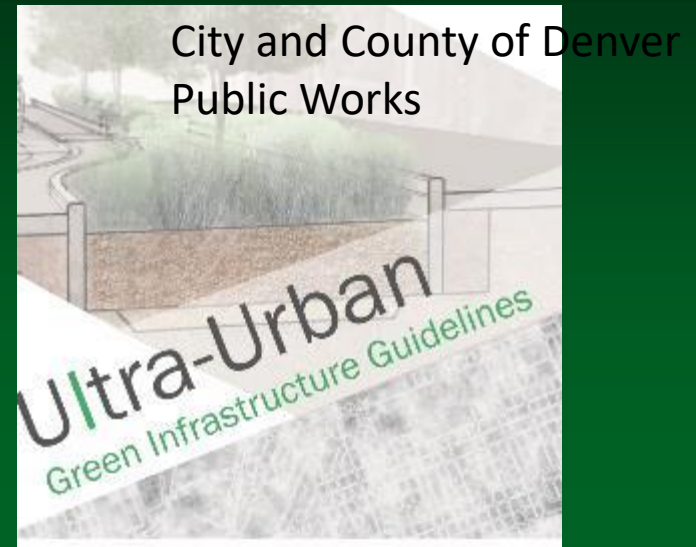
Hardworking Wetlands: Wetland Values

- Highest Social Value Score
- Popular trails, water feature
- Lengthy corridor: buffers protecting wetland
- History of land use and waste
- Erosion and sediment in channel
- Active beaver



Management Recommendations

- Protect Wetlands, Riparian Areas, and Buffers
- Integrate Wetland Health into Stormwater Planning
- Watershed Friendly Trails and Recreation
- Limit Chemicals
- Monitor Cattail
- Manage bullfrogs
- Encourage Beaver



Wetland Planning and Stewardship

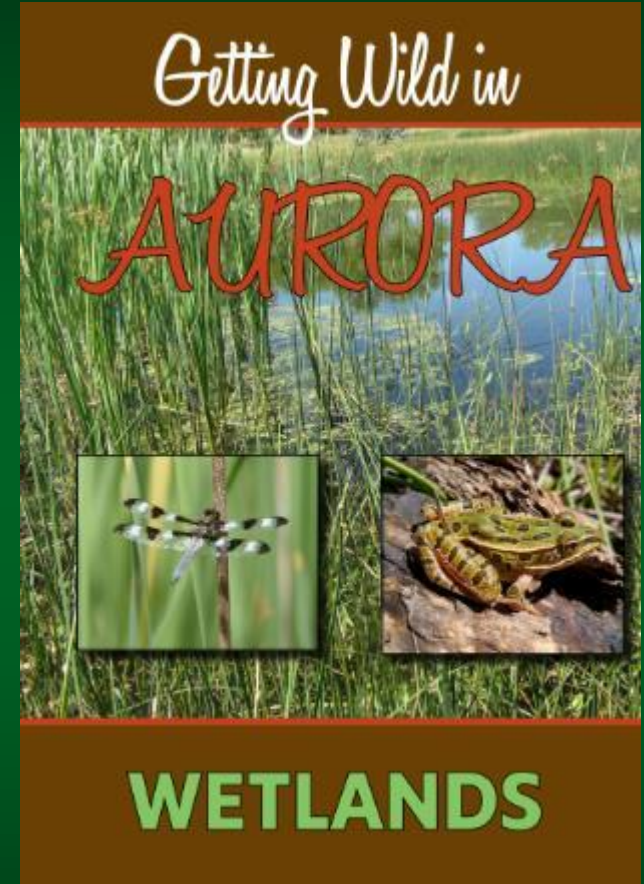
Outreach Brochure:

Aurora Wetlands Provide

- Flood control
- Improved water quality
- Continuous riparian corridor networks
- Beaver ecosystem services
- Wildlife Habitat
- Many other services!

Programmatic Development:

- Watershed planning
- Continued research and monitoring
- Outreach and education



Urban wetland inventory and monitoring is needed to plan for long-term watershed health.

Contact :

- Laurie.Gilligan@colostate.edu

Funding and Support:

EPA Wetland Program Development Grant
City of Aurora

Thanks ASWM for hosting this webinar.

Report and Brochure are on CNHP's Website:

https://cnhp.colostate.edu/download/documents/2020/FINALAuroraReport_with_appendices_0221_web.pdf

https://cnhp.colostate.edu/download/documents/0/AuroraWetlandsBrochure_FINAL11x17.pdf

