

**Montana Wetland Council Presents:  
Tech Transfer Webinar Series**

***Montana Wetland and Riparian  
Mapping  
Where to Find It and How to Use It***

**Presenter: Levia Shoutis  
Moderator: Lynda Saul**



**MONTANA WETLAND COUNCIL**

# HAVING TROUBLE WITH THE SOFTWARE?



Check your email from yesterday:

1. You were sent a link to instructions for how to use the GoToWebinar software.
2. You were also sent a PDF of today's presentation. This means you can watch the PDF on your own while you listen to the audio portion of the presentation by dialing in on the phone number provided to you in your email.



If you have any technical difficulties during the webinar you can email or call Erin at [erin.rykken@erm.com](mailto:erin.rykken@erm.com) or 406-222-7600 during the webinar.



# Agenda

- Welcome and Introductions (5 minutes)
- Wetland and Riparian Mapping: Where to Find It and How to Use It (75 minutes). (Pauses for Q&A)
- Question & Answer (10 minutes)
- Wrap up (1 minute)

# Today's Presenter



**Levia Shoutis, PWS**

**Environmental Resources Management  
(ERM), Inc.**

**(406) 222-7600 x229**

**[levia.shoutis@erm.com](mailto:levia.shoutis@erm.com)**

# Montana Wetland and Riparian Mapping Center, MNHP



**Karen Newlon**

**Ecologist/Project Manager**

**Montana Natural Heritage Program**

**(406) 444-0915**

**[KNewlon@mt.gov](mailto:KNewlon@mt.gov)**

# Moderator



**Lynda Saul, PWS, CFM**

**Wetland Program Coordinator**

**Montana DEQ**

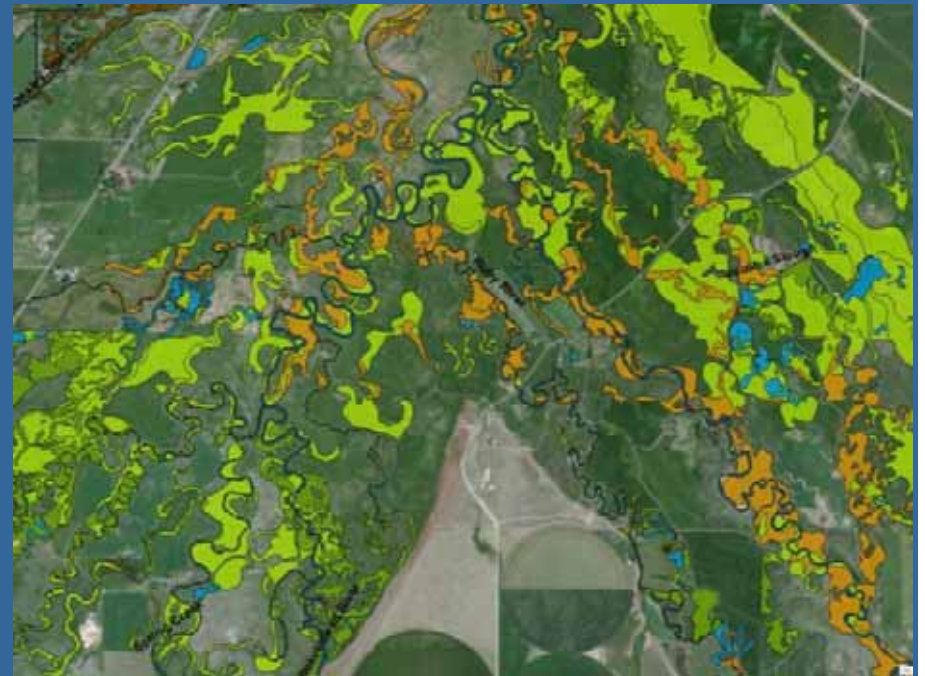
**(406) 444-6652**

**lsaul@mt.gov**

# Montana Wetland and Riparian Mapping

## Where to Find It and How to Use It

Levia Shoutis, PWS  
ERM, Inc.  
Livingston, MT

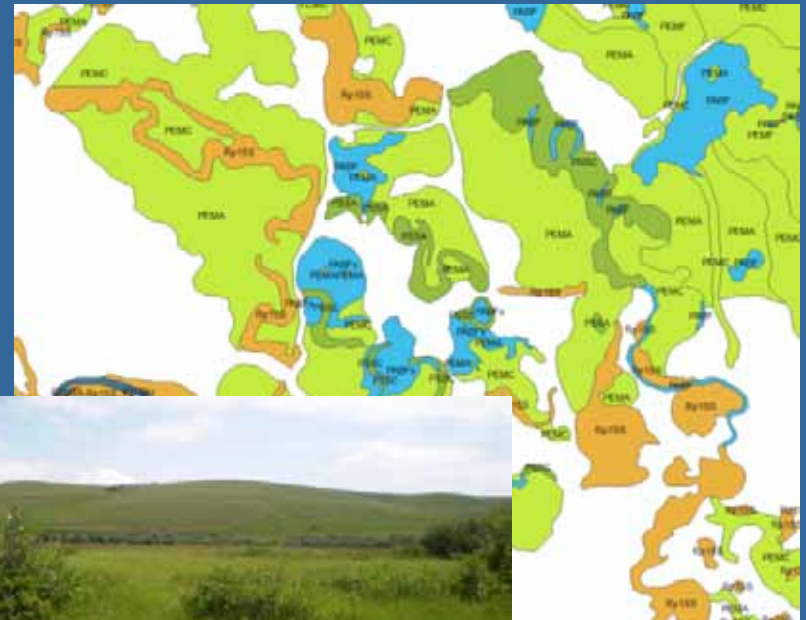




# Training Goals

The goal is for participants to understand:

- What wetland and riparian mapping is
- How to access the mapping
- Potential uses and limitations



# Training Overview

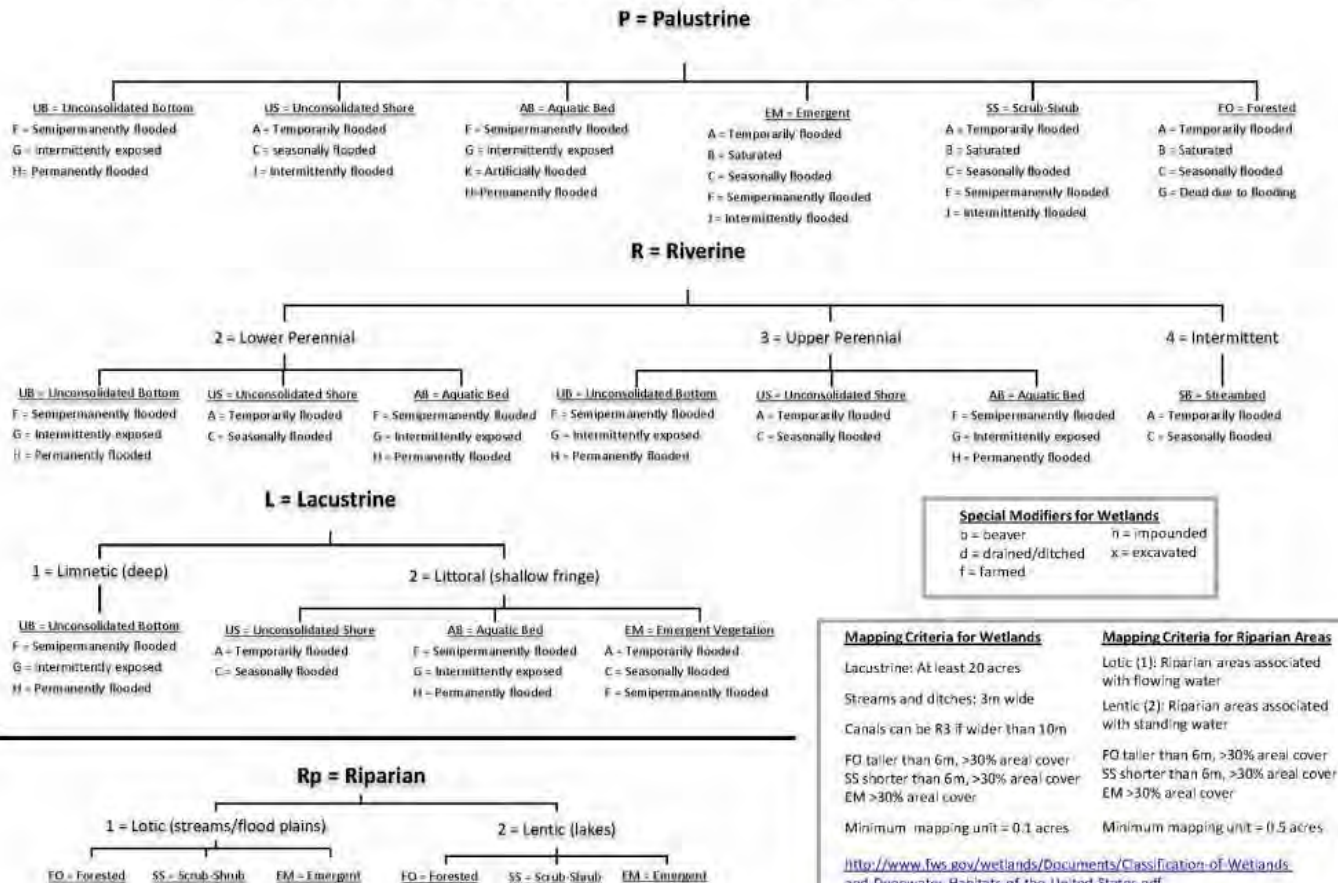
- Definition of wetland and riparian areas
- What is wetland and riparian mapping?
- Mapping programs and status
- How mapping is created, limitations
- Classification systems
- Accessing mapping
- Hands-on mapping activity
- Uses and examples





# Handouts

## Attributes for Mapping Wetland and Riparian Areas in Montana



<http://www.fws.gov/wetlands/Documents/Classification-of-Wetlands-and-Dropwater-Habitats-of-the-United-States.pdf>

<http://www.fws.gov/wetlands/Documents/A-System-for-Mapping-Riparian-Areas-In-The-Western-United-States-2009.pdf>

## Wetland definition:

From: USFWS National Wetlands Inventory (Cowardin et al. 1979)

Lands transitional between upland and aquatic systems where the water table is usually at or near the surface or inundated by shallow water.

A wetland must have one or more of the following attributes:

1. Dominated by wetland plants
2. Substrate is predominantly hydric soil
3. Substrate is saturated or covered by shallow water at some time during the growing season annually.

***Definition is non-regulatory***



## Riparian definition:

From: USFWS (2009)

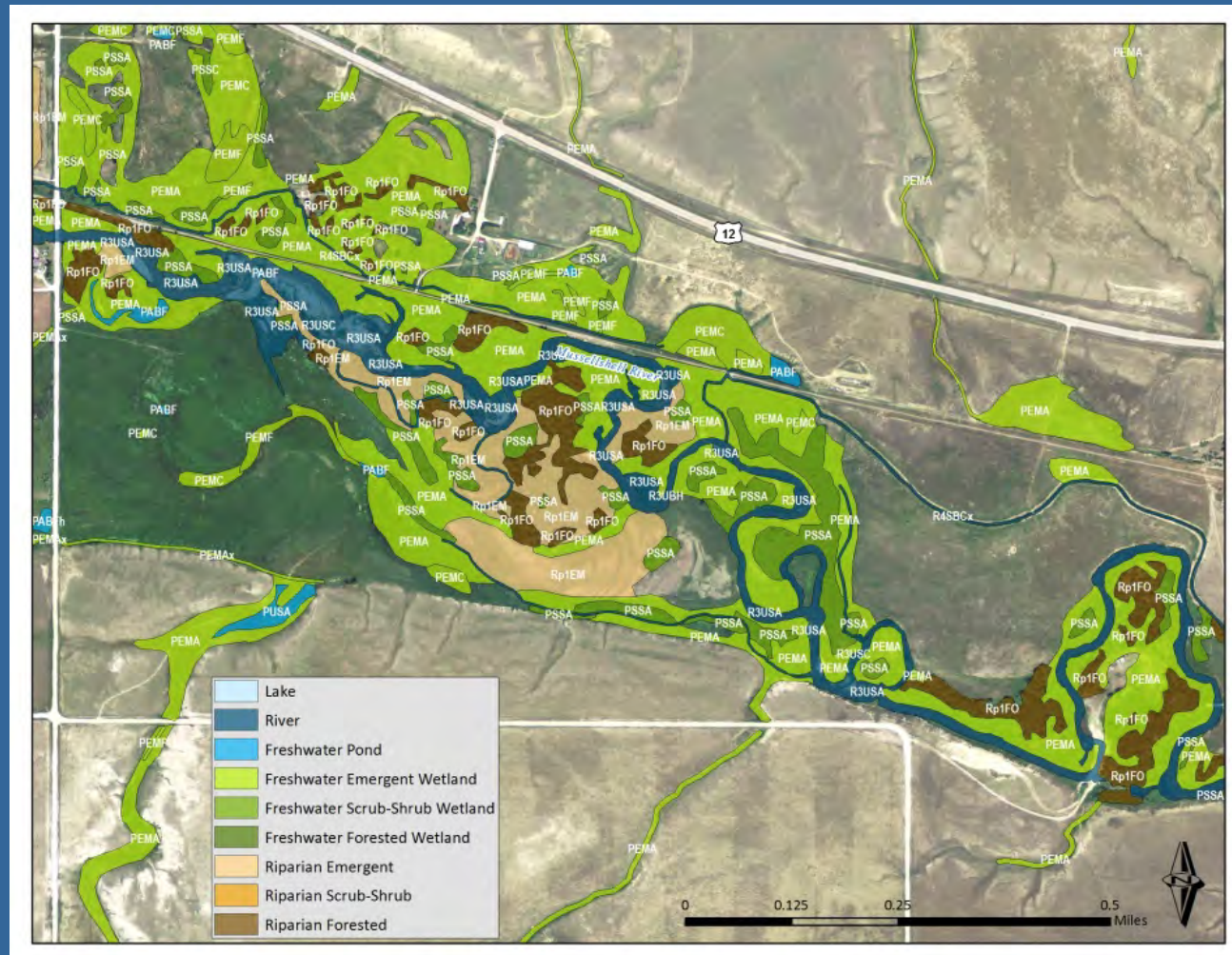
Plant communities contiguous to and affected by surface and subsurface hydrologic features; usually transitional between wetland and upland.

Mapped as riparian where soils, plants, and hydrology do not display wetland characteristics.



# What is Wetland and Riparian Mapping?

- Digital maps of potential wetland and riparian areas
- Maps are developed using aerial imagery interpretation



# Training Overview

- Definition of wetland and riparian areas
- What is wetland and riparian mapping?
- **Mapping programs and status**
- How mapping is created, limitations
- Classification systems
- Accessing mapping
- Hands-on mapping activity
- Uses and examples

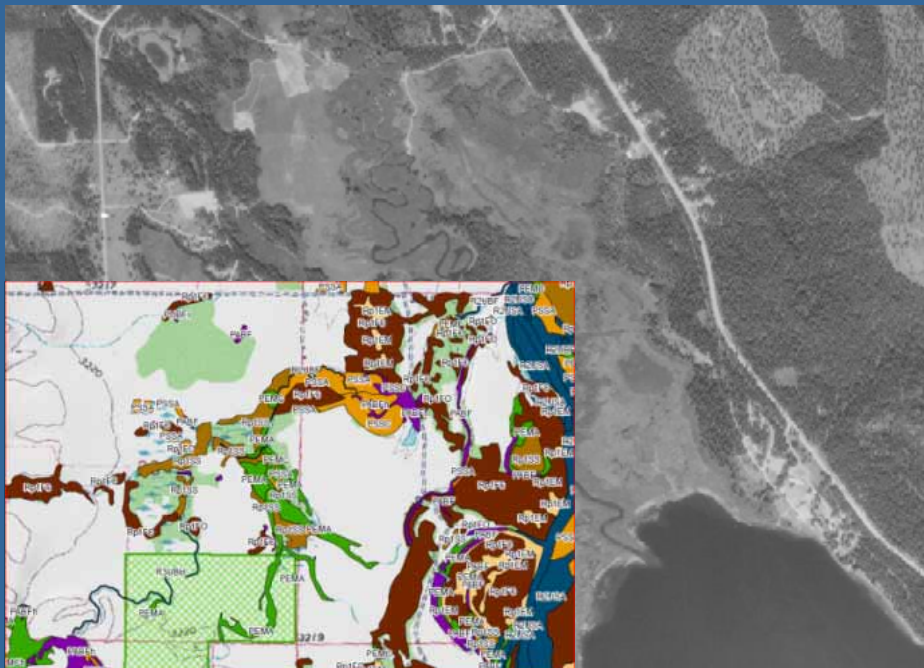




# USFWS National Wetlands Inventory

[www.fws.gov/wetlands](http://www.fws.gov/wetlands)

- Goal: conduct a nationwide inventory of wetlands in the U.S.
- Maps and classifies wetland, riparian, and deepwater habitats
- Preliminary tool-non-regulatory



U.S. Fish & Wildlife Service  
**National Wetlands Inventory**  
Ecological Services

SEARCH NWI DATABASE

Home | Wetlands Data | Status and Trends | Wetlands Layer | Other Topics | National Wetlands Inventory | Contact Information

### The National Wetlands Inventory

The National Wetlands Inventory (NWI) has been producing wetland maps and geospatial wetland data for the United States since the mid-1970s. The focus has been on two fronts: 1) map or digital database preparation and delivery to the public, and 2) providing and reporting on national wetland trends using a probability-based sampling design. The status of mapping has been made available through various media throughout NWI's 30-year history (e.g., state atlases, regional status maps, and now through the internet via the Wetlands Mapper online tool).

National Wetlands Centers are located in each of the Service's regions. The [National Wetlands Center](#) is located in Madison, WI, and is the home of the [Wetlands Center](#) as well as staff providing scientific and support for all geospatial applications of wetlands data. The [Wetlands Mapper](#) serves as the data discovery mechanism and is managed in cooperation with the U.S. Geological Survey in Madison, WI.

The [U.S. Fish and Wildlife Service](#) (Service) is the principal Federal agency that provides information to the public on the extent and status of the Nation's wetlands. The agency has developed a series of topical maps to show wetlands and deepwater habitats. This geospatial information is used by Federal, State, and local agencies, academic institutions, and private industry for management, research, policy development, education and planning activities. Digital data can be viewed and downloads are available through the [Wetlands Mapper](#).

The [U.S. Fish and Wildlife Service](#) is headquartered in Arlington, Virginia, and responsible for the geospatial wetlands data data to the Division of Budget and Technical Support.

#### NWI Overview

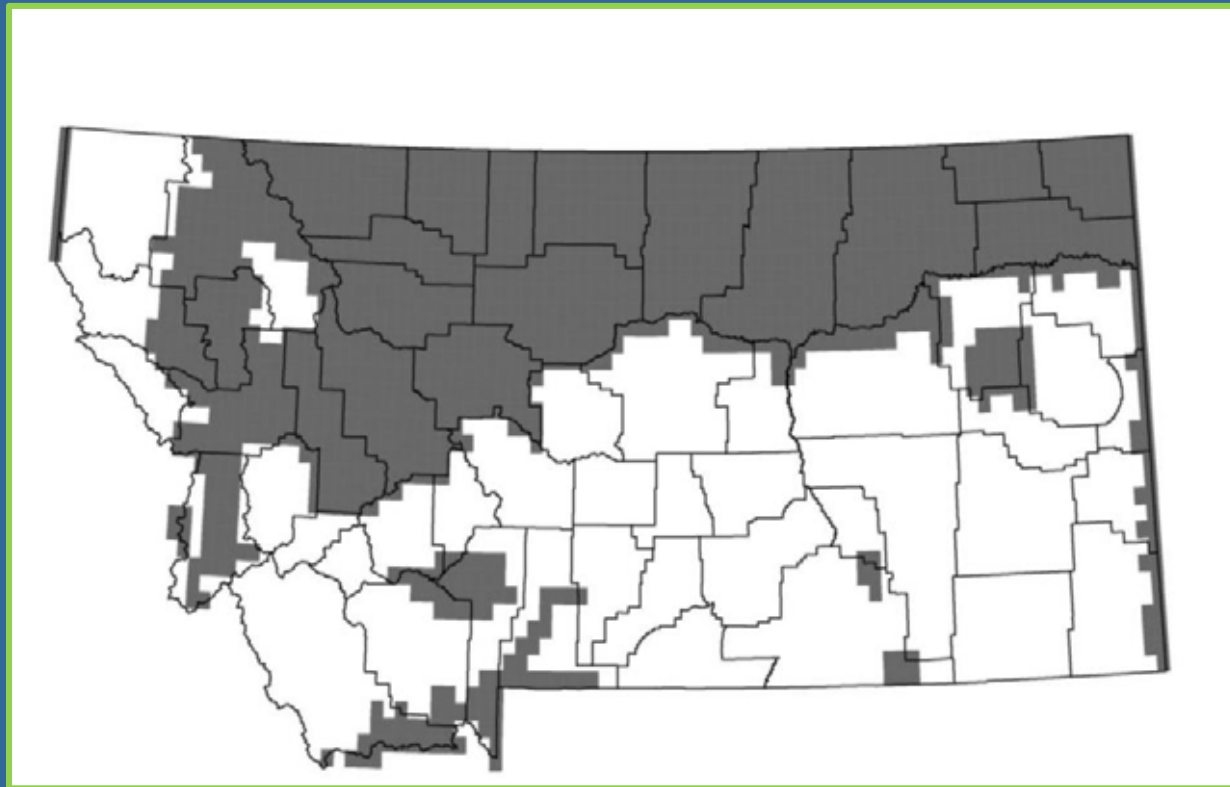
The National Wetlands Inventory (NWI) was established by the US Fish and Wildlife Service (Service) in 1974 to conduct a nationwide inventory of U.S. wetlands to provide its biologists and others with information on the distribution of wetlands to aid in wetland conservation efforts.

[Click here to view the NWI Overview.](#)

U.S. Fish and Wildlife Service  
Branch of Geospatial Mapping and Technical Support  
4401 N. Fairfax Drive, Room 825  
Arlington, VA 22203

# Status of NWI Mapping in Montana circa 2006

- Completed in 1980's, wetlands only, no riparian
- Considered "historic" mapping to be updated
- *Not always representative of "historic" conditions*

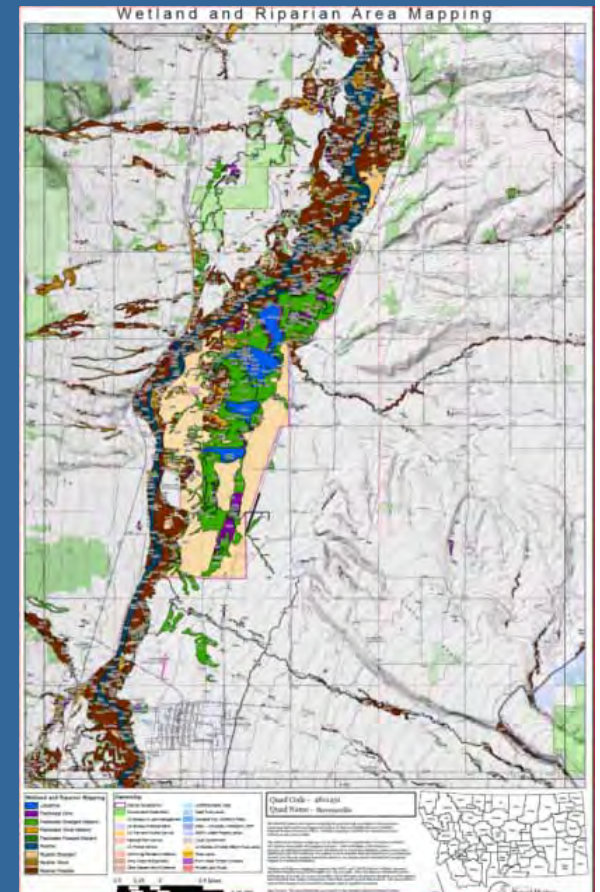


# Montana Natural Heritage Program Wetland and Riparian Mapping Center

[www.mtnhp.org/nwi](http://www.mtnhp.org/nwi)

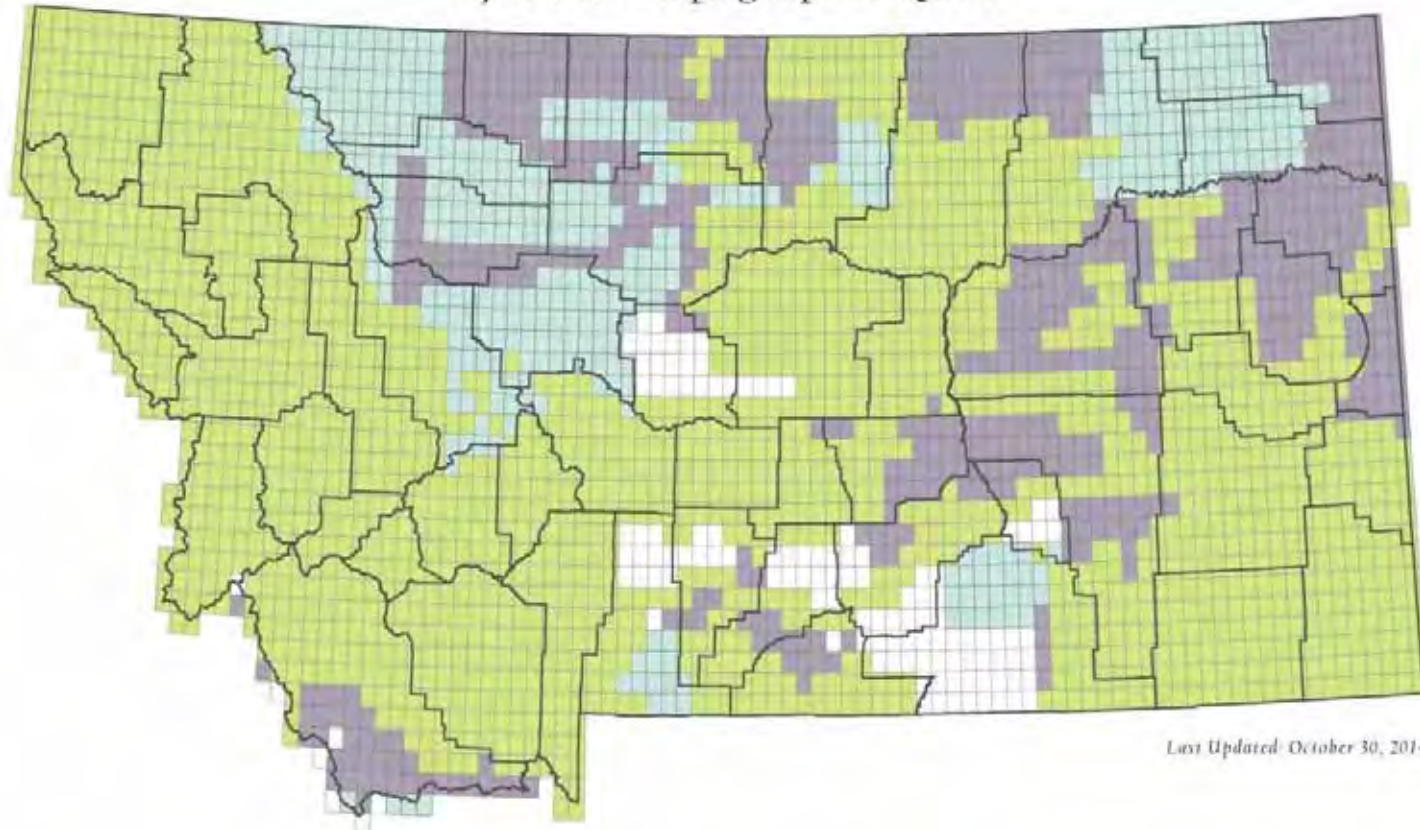
- Started in 2006
- Five full time GIS specialists
- Maps and classifies wetland, riparian, and deepwater habitats to NWI standards
- Provides mapping to NWI

***New mapping is available from MTNHP  
before NWI***








# Status of Mapping as of October 2014

## Wetland and Riparian Mapping Status by USGS Topographic Quad



*Last Updated: October 30, 2014*

-  Mapping Available for Download in the Montana Wetland and Riparian Framework
-  Mapping in Progress or Scheduled to be Mapped by MTNHP
-  Historic NWI Mapping completed by USFWS (no Riparian mapping)
-  No Wetland and Riparian Mapping Available
-  County Boundary

# Historic Versus New Mapping Lower Gallatin River Watershed

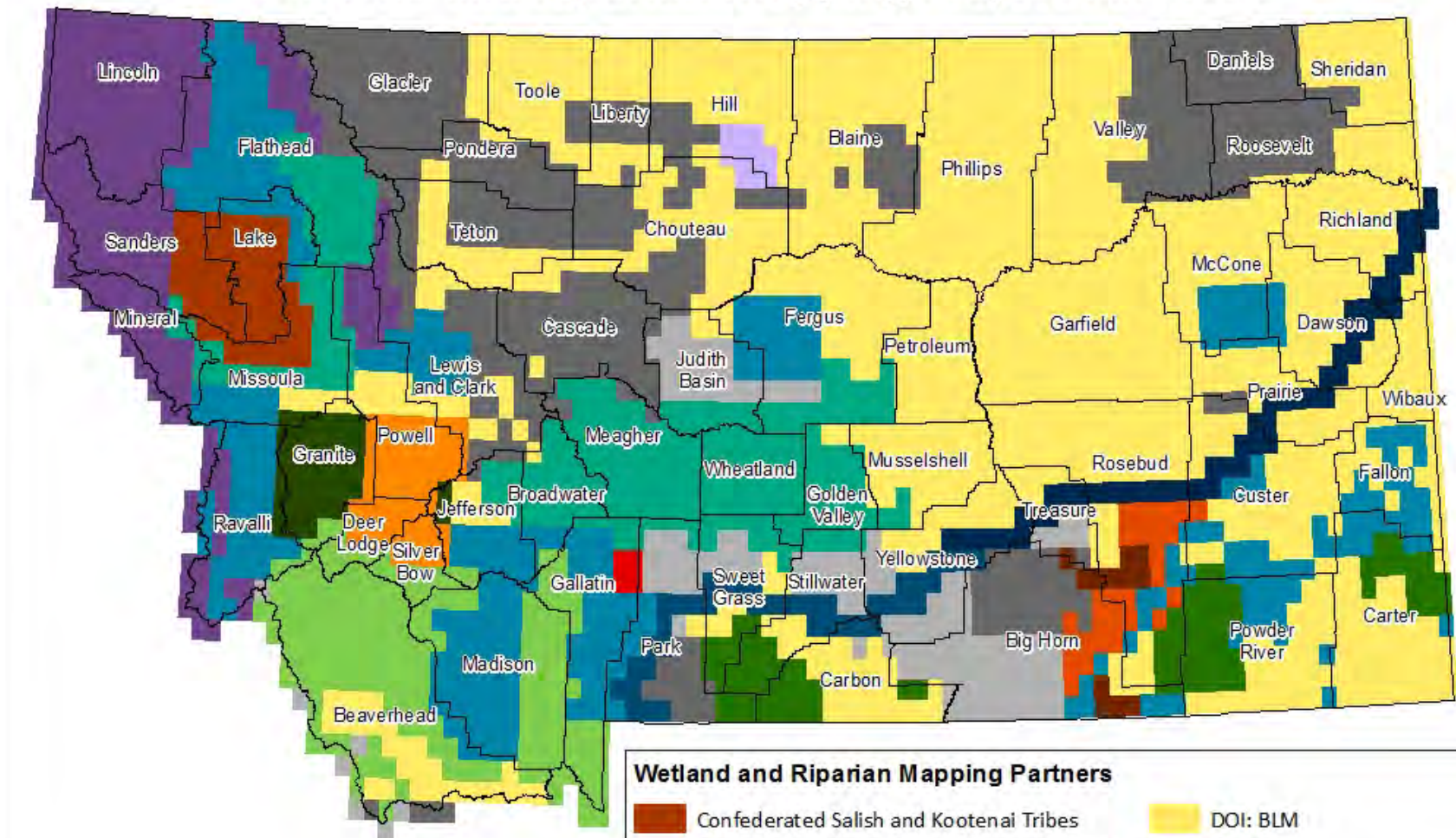


Historic Mapping



New Mapping

# Wetland and Riparian Mapping Project Partners



Mapped from 1980s Imagery (USFWS)  
 No Mapping Available

**Wetland and Riparian Mapping Partners**

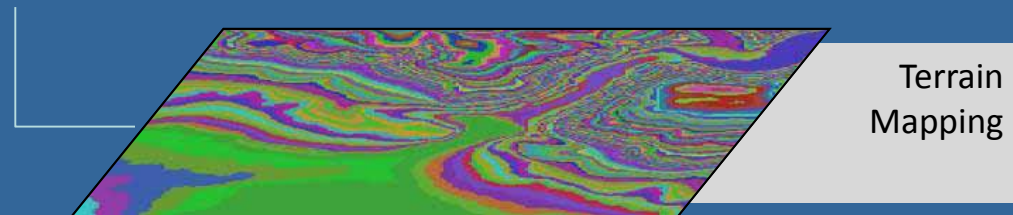
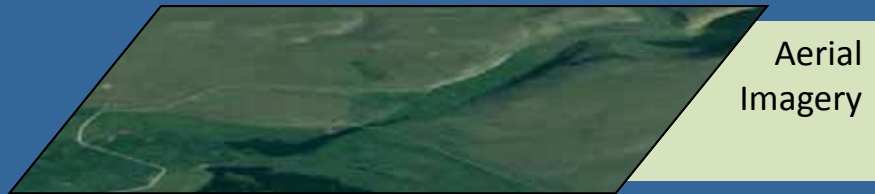
<span style="display: inline-block; width: 15px; height: 10px; background-color: brown; border: 1px solid black;"></span> Confederated Salish and Kootenai Tribes	<span style="display: inline-block; width: 15px; height: 10px; background-color: yellow; border: 1px solid black;"></span> DOI: BLM
<span style="display: inline-block; width: 15px; height: 10px; background-color: lightgreen; border: 1px solid black;"></span> SWMT - (MT DEQ, PPL, MLIA, USFS Region1)	<span style="display: inline-block; width: 15px; height: 10px; background-color: cyan; border: 1px solid black;"></span> US EPA
<span style="display: inline-block; width: 15px; height: 10px; background-color: orange; border: 1px solid black;"></span> MT DOJ: Natural Resource Damage Program	<span style="display: inline-block; width: 15px; height: 10px; background-color: darkgreen; border: 1px solid black;"></span> USFS - Custer National Forest
<span style="display: inline-block; width: 15px; height: 10px; background-color: darkred; border: 1px solid black;"></span> MT DEQ Mines	<span style="display: inline-block; width: 15px; height: 10px; background-color: purple; border: 1px solid black;"></span> Great Northern LCC
<span style="display: inline-block; width: 15px; height: 10px; background-color: darkblue; border: 1px solid black;"></span> US Army Corps of Engineers	<span style="display: inline-block; width: 15px; height: 10px; background-color: red; border: 1px solid black;"></span> MT DEQ
<span style="display: inline-block; width: 15px; height: 10px; background-color: navy; border: 1px solid black;"></span> MLIA/Yellowstone River Conservation District	<span style="display: inline-block; width: 15px; height: 10px; background-color: orange; border: 1px solid black;"></span> Northern Cheyenne Tribe
<span style="display: inline-block; width: 15px; height: 10px; background-color: lightpurple; border: 1px solid black;"></span> Chippewa Cree Tribe	<span style="display: inline-block; width: 15px; height: 10px; background-color: darkgreen; border: 1px solid black;"></span> US Forest Service - Region 1
<span style="display: inline-block; width: 15px; height: 10px; background-color: teal; border: 1px solid black;"></span> MT Land Information Act	

# Training Overview

- Definition of wetland and riparian areas
- What is wetland and riparian mapping?
- Mapping programs and status
- **How mapping is created, limitations**
- Classification systems
- Accessing mapping
- Hands-on mapping activity
- Uses and examples



# How is Mapping Created?





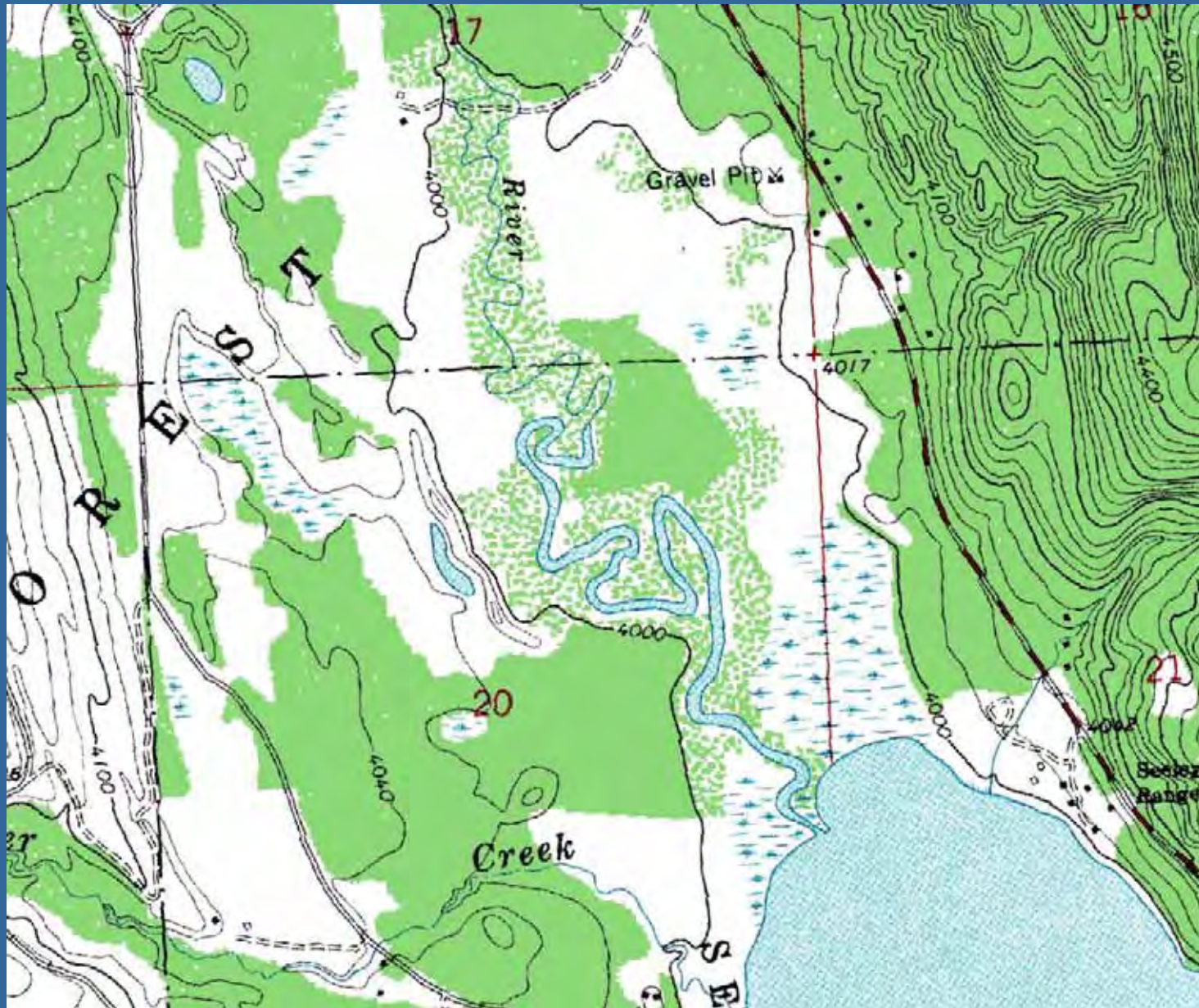
# Color Infrared Imagery



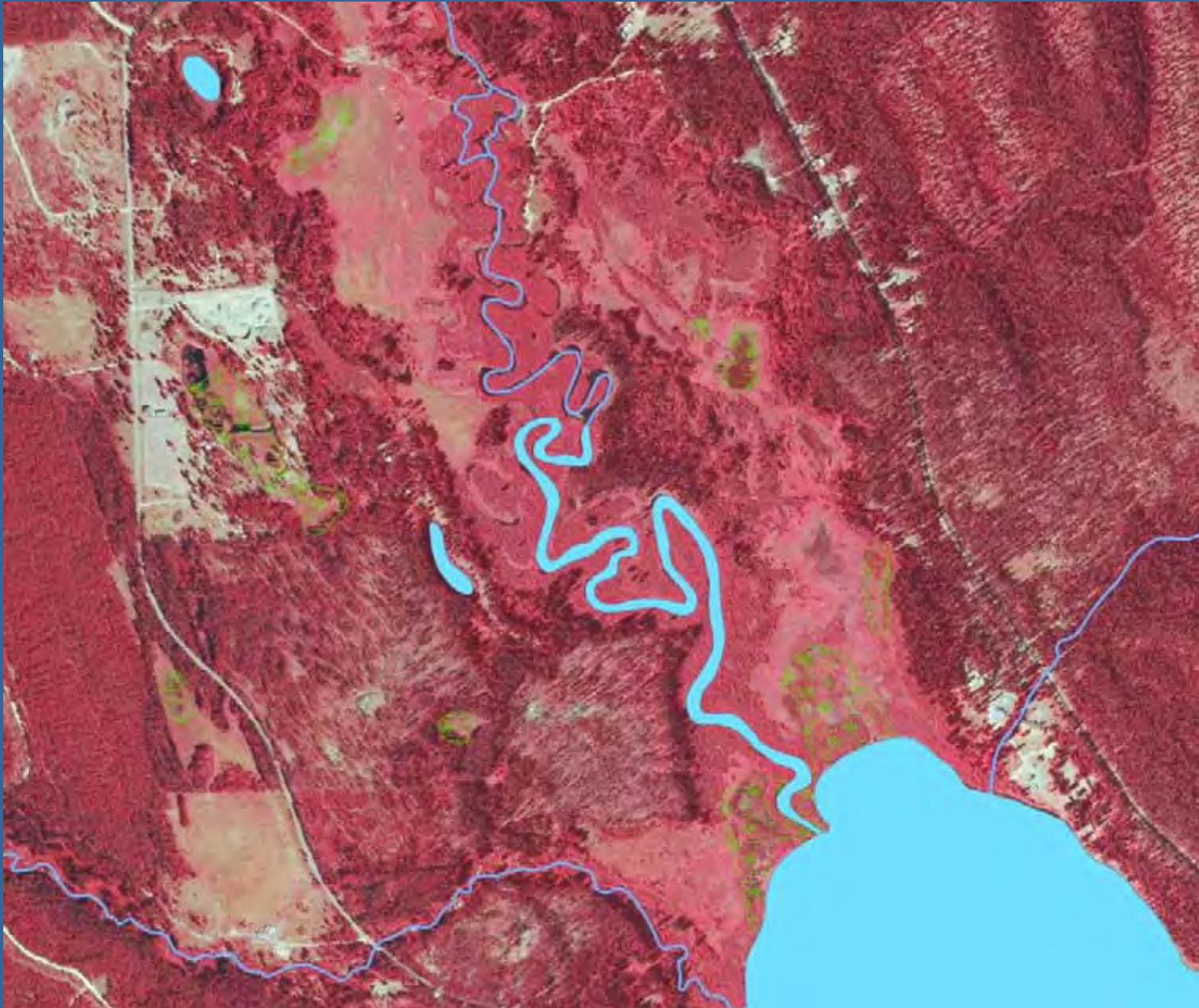
# Natural Color Imagery



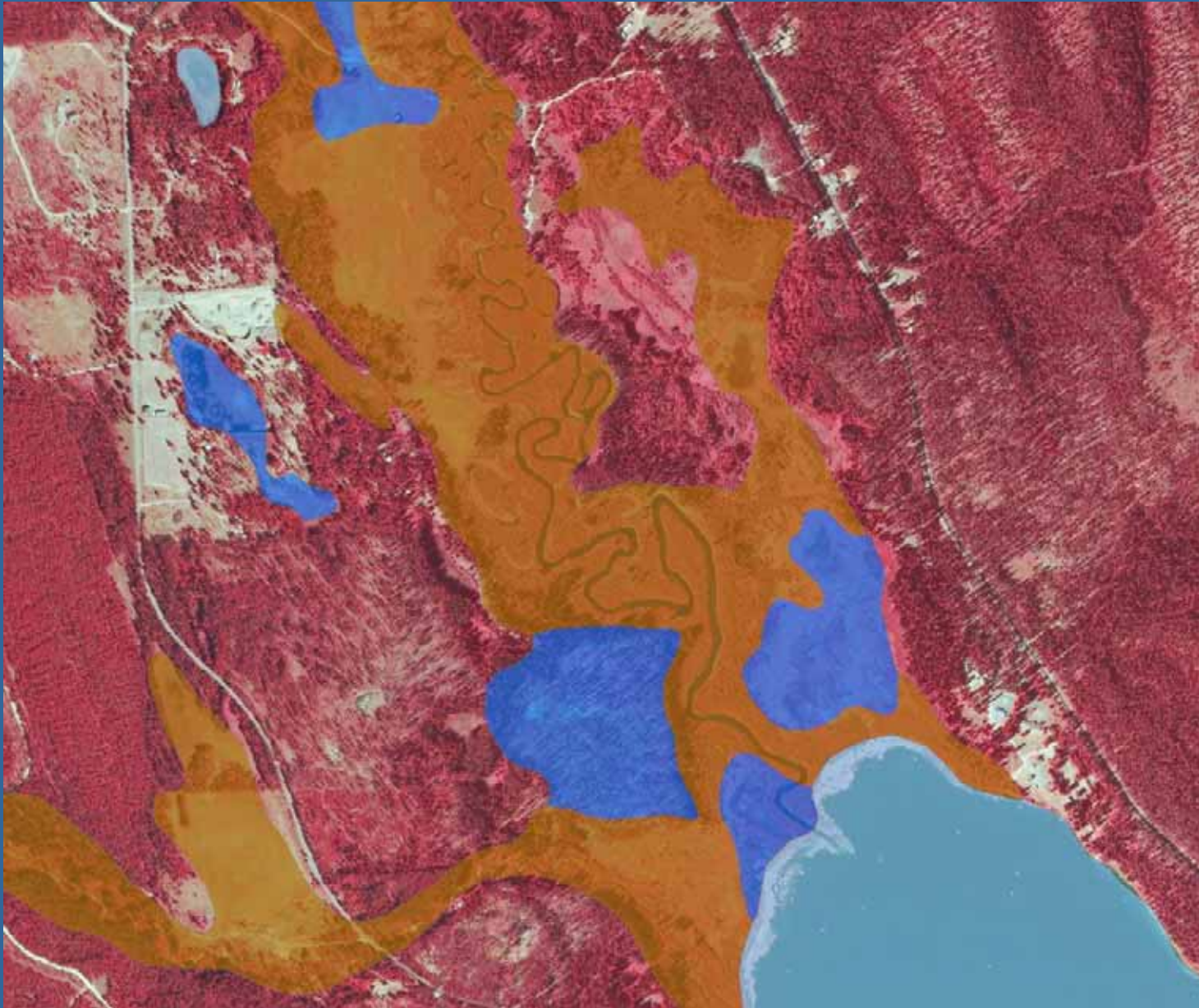
# Topographic Maps



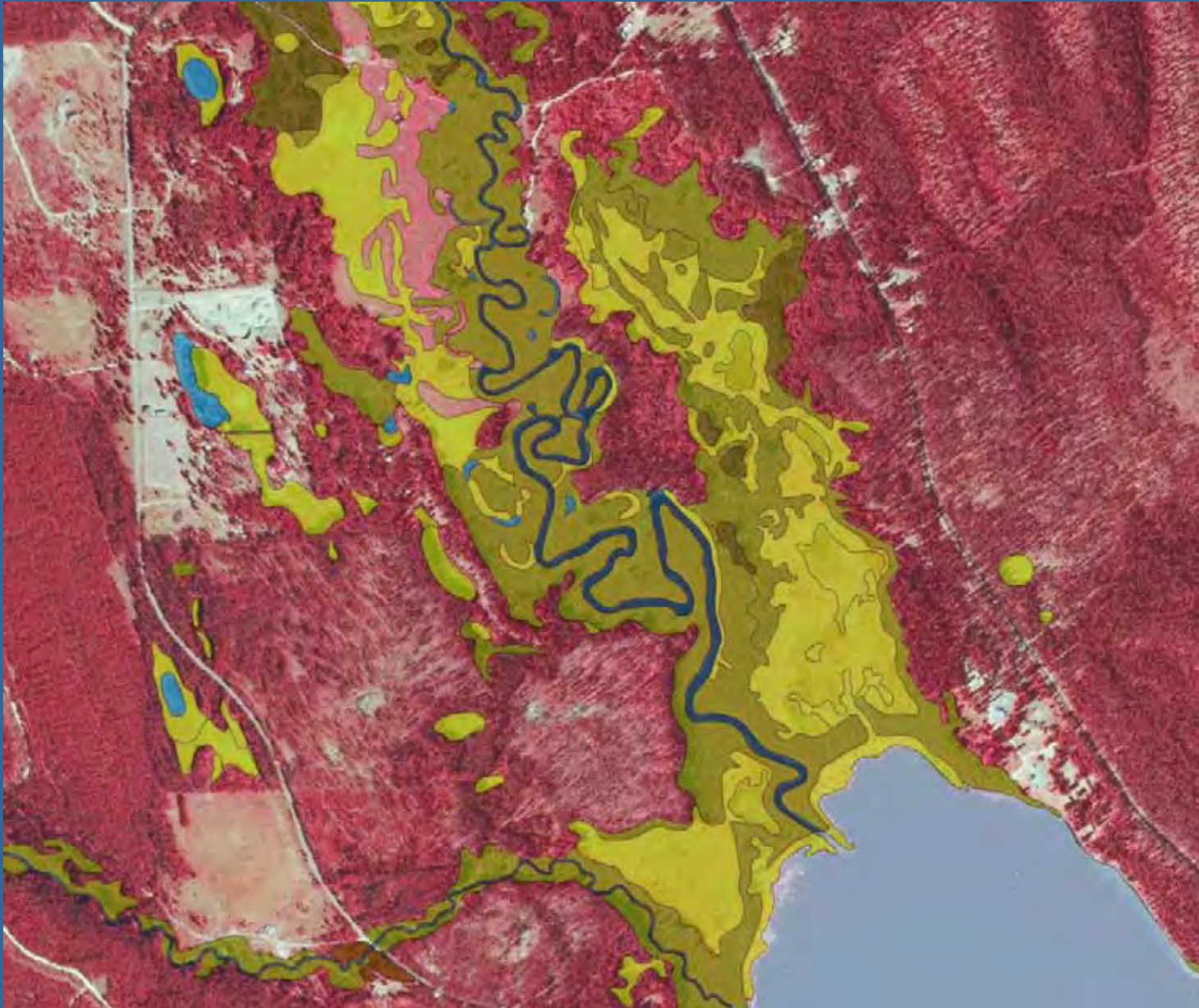
# Hydrography



# Potential Wetland Soils



# Result: Wetland and Riparian Mapping



# Limitations?

- Landscape level, reconnaissance information
- Accuracy depends upon image quality, image date, and image analyst experience
- Function information is limited (easily added to database)
- No condition information (easily added to database)
- Scale limitations
  - Minimum mapping unit: wetlands, 0.1 ac; riparian, 0.5 ac
  - Publication scale: 1:12,000 or “smaller”
- No CWA jurisdictional information
- Requires groundtruthing for site use







# Palustrine Wetlands

## Freshwater Wetlands

- Greater than 30% vegetation cover, *OR*
- Unvegetated, or vegetation covers less than 30% of area, but less than 20 acres, and less than 6.6 ft deep



Palustrine scrub-shrub



Palustrine emergent

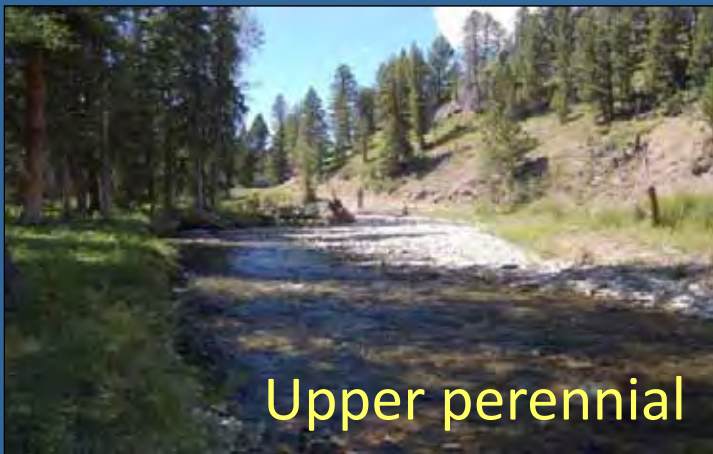


Palustrine emergent

Palustrine  
unconsolidated bottom or  
aquatic bed

# Riverine Wetlands

- Located *within* a stream or river channel with less than 30% vegetation cover



# Riparian Areas

- Vegetated areas contiguous to rivers, streams, lakes, or drainage ways that are influenced by both surface and below surface hydrology.

Riparian forest



Riparian forest



Riparian scrub-shrub

# Questions?



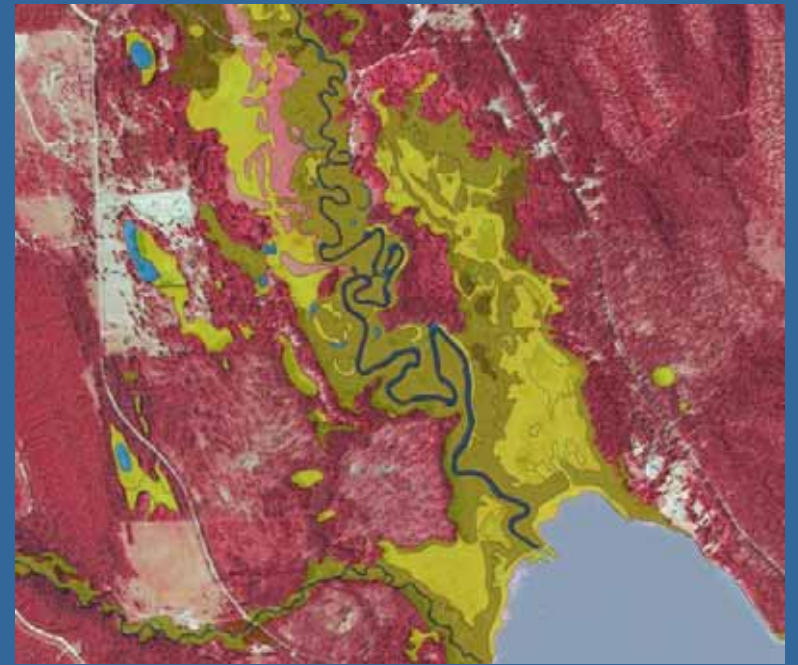
# Training Overview

- Definition of wetland and riparian areas
- What is wetland and riparian mapping?
- Mapping programs and status
- How mapping is created, limitations
- Classification systems
- **Accessing mapping**
- Hands-on mapping activity
- Uses and examples



# Accessing Mapping

1. MTNHP Map Viewer: mapping status and mapping
2. GIS
  - a. View mapping as a Map Service layer in GIS
  - b. Download mapping for use in GIS



# Accessing Mapping

## Comparison of Access Methods

Application	MapViewer	GIS	GIS
		MapService	Download
GIS skill level required	None	Low	Moderate
Preliminary review	X	X	X
View data attributes using identify tool	X	X	X
Data summary	X	X	X
Overlay ancillary data layers	X	X	X
Overlay project infrastructure layers		X	X
View data in attribute table			X
Data analysis			X
Edit data (shapes or attributes)			X

# Accessing Mapping

MT Natural Heritage Program  
Wetland and Riparian Mapping Center  
<http://mtnhp.org/NWI>

View mapping and other data layers in Map Viewer

GIS Options: Map Service or Download

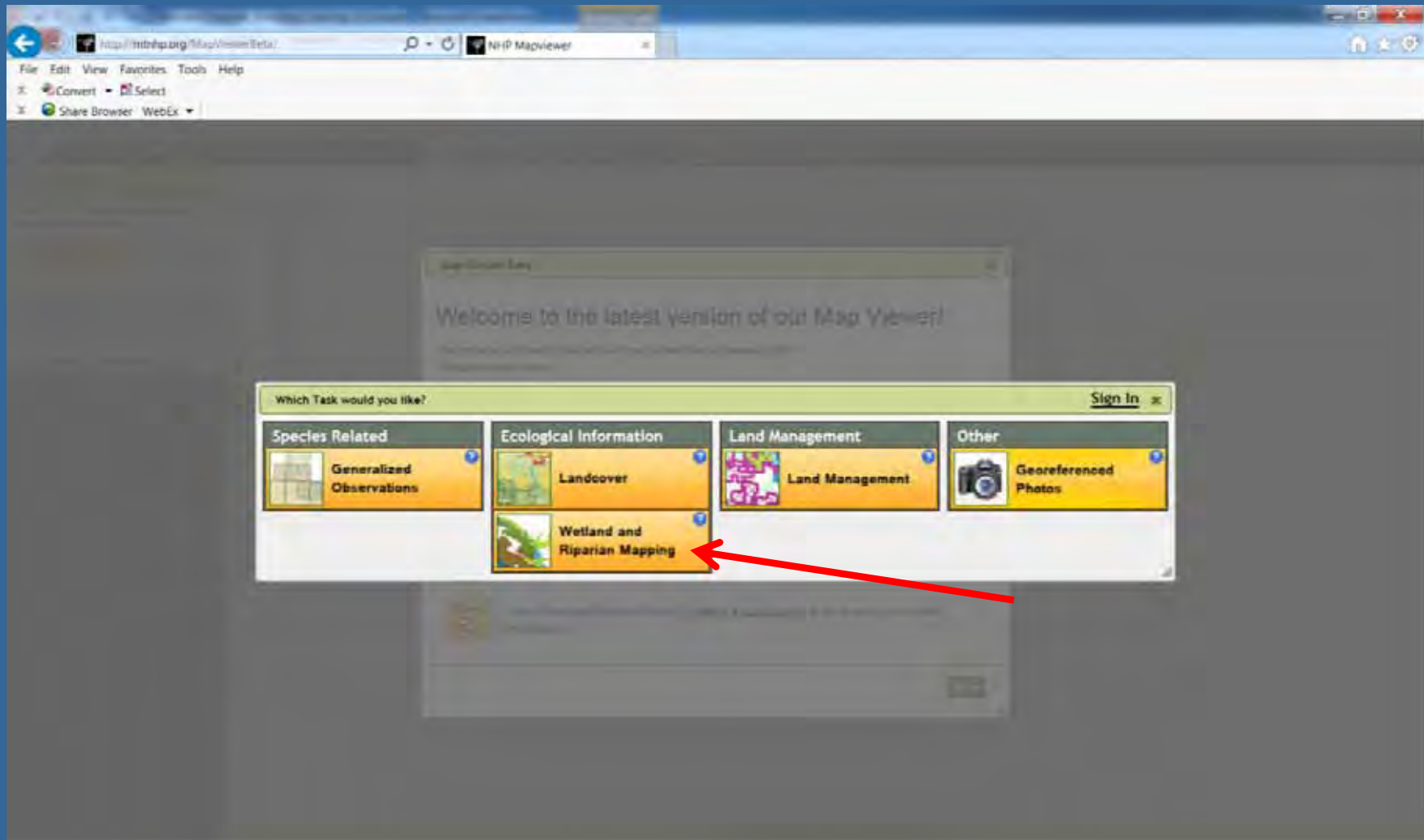
View status of mapping in MT (new, historic)

The screenshot shows the website's main content area. On the left, there is a 'Partners Map' section with a map of Montana. The central column features a 'Wetland and Riparian Mapping Center' header, followed by a 'Wetland and Riparian Mapping Status' section with links to 'Natural Heritage Map Viewer-Wetland and Riparian Mapping', 'View & Download Wetlands Data', and 'National Wetlands Inventory Guide'. Below this is an 'Other Information' section with links for 'View Ecology Information', 'View Aquatic Information', 'Land Stewardship Mapping', 'View Plant Information', 'View Animal Information', 'Submit Observations', and 'Request Information'. A large map of a wetland area is displayed below these links, with the caption 'View an example of Montana wetland and riparian mapping.' To the right of the main content is a 'Mapping Status' section with a map of Montana showing mapping progress, and a 'Related Links' section with various external resource links. At the bottom, there is a 'Mapping Status by Watershed' section with another map of Montana. The footer contains social media icons, a search bar, and the 'mt.gov' logo.



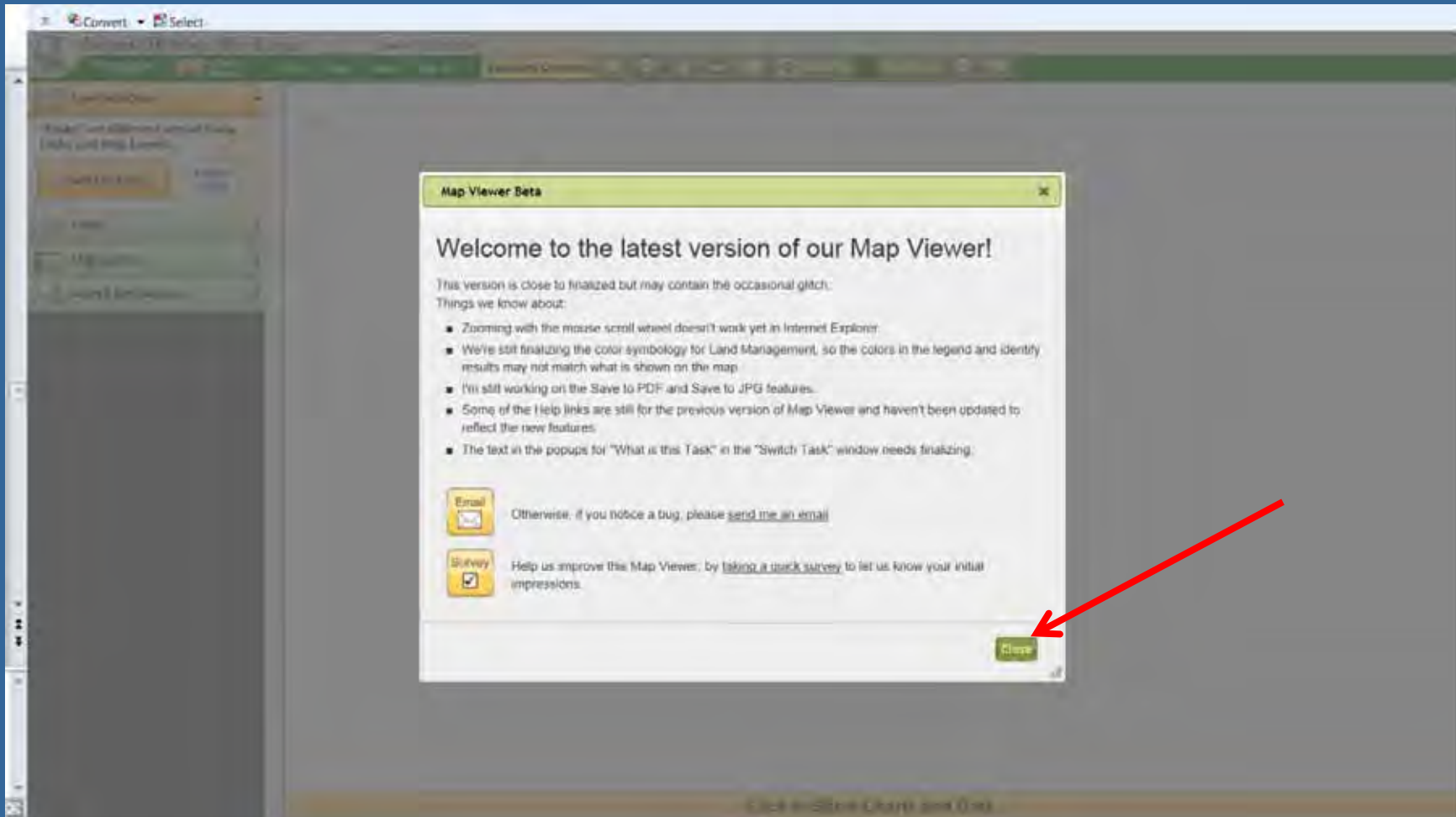
# Map Viewer

[mtnhp.org/mapviewer/](http://mtnhp.org/mapviewer/)



# Map Viewer

Review known bugs, click “Close”



# Map Viewer

The screenshot displays the 'NATURAL HERITAGE MAP VIEWER' interface. At the top, a green toolbar contains 'Standard Controls' (with a red arrow pointing to it), navigation icons, and 'Full Extent'. Below the toolbar is a map of Montana with cities like Kalispell, Missoula, Helena, and Bozeman labeled. A 'Legend' window on the right lists 'Wetland and Riparian' types: Lake, River, Freshwater Pond, Freshwater Emergent Wetland, and Freshwater Scrub-Shrub Wetland, with sub-categories for Final, Provisional, and Historic. On the left, a 'Map Layers' panel (with a red arrow pointing to it) lists layers such as 'Show Summarize Boundaries', 'Land Management', 'Wetland and Riparian Mapping Status', 'Wetland and Riparian (historic)', 'Wetland and Riparian', 'Lakes and Streams', 'Counties', 'Township, Range & Section', 'Roads', 'Towns', 'LL, QLL, QQLL', 'Site Photos', and 'State Mask'. A 'Base Layers' section at the bottom left shows 'Air Photos' for the year 2009. A yellow bar at the bottom right contains the text 'Click to Show Charts and Data'.

# Map Viewer

In Map Layers, click on “Wetland and Riparian”

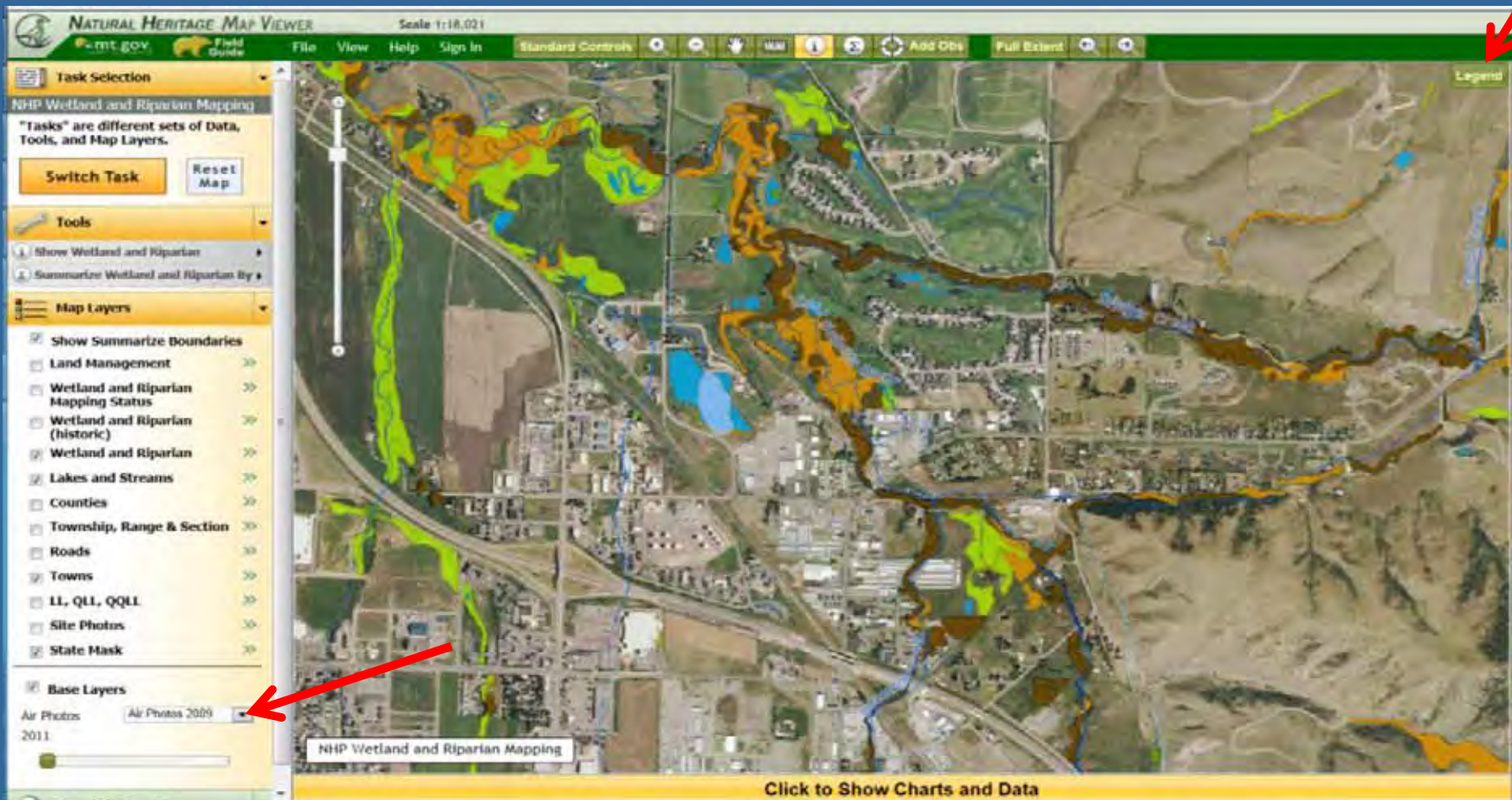
To add aerial imagery, click “Base Layers”

The screenshot displays the 'NATURAL HERITAGE MAP VIEWER' interface. The top navigation bar includes 'File', 'View', 'Help', 'Sign In', and 'Standard Controls'. The left sidebar contains several sections: 'Task Selection' with a 'Switch Task' button, 'Tools' with 'Show Wetland and Riparian' and 'Summarize Wetland and Riparian It', and 'Map Layers' with a list of layers including 'Show Summarize Boundaries', 'Land Management', 'Wetland and Riparian Mapping Status', 'Wetland and Riparian (historic)', 'Wetland and Riparian', 'Lakes and Streams', 'Counties', 'Township, Range & Section', 'Roads', 'Towns', 'LI, QLI, QQLI', 'Site Photos', 'State Mask', and 'Base Layers'. Two red arrows point to the 'Wetland and Riparian' and 'Base Layers' items. The main map area shows a river system with various colored overlays. A 'Legend' box is in the top right, and a 'Click to Show Charts and Data' button is at the bottom. The scale is 1:18,021.

# Map Viewer

## Base Layers

- Aerial imagery, hillshade (terrain), color IR imagery, topographic map, landcover



# Map Viewer

## Legend

- Click “Wetland and Riparian Explanations” to view classification details

The screenshot displays the Natural Heritage Map Viewer interface. The main map area shows a landscape with various wetland and riparian classifications overlaid on a satellite-style background. The interface includes a top menu bar with options like File, View, Help, and Sign In. On the left, there are panels for Task Selection, Tools, and Map Layers. On the right, a Legend panel is open, showing a list of classification types with corresponding color swatches. A red arrow points to the 'Wetland and Riparian Explanations' link in the legend panel. At the bottom of the map, there is a yellow bar with the text 'Click to Show Charts and Data'.

**Legend**

Wetland and Riparian

Wetland and Riparian Explanation of

Final	Provisional	Historic	Type
			Lake
			River
			Freshwater Pond
			Freshwater Emergent Wetland
			Freshwater Scrub-Shrub Wetland

Click to Show Charts and Data

# Map Viewer

## Legend

- Links to wetland and riparian classification document

### A GUIDE TO WETLAND AND DEEPWATER HABITATS CLASSIFICATION USED IN THE NATIONAL WETLAND INVENTORY (NWI) MAPPING

#### **Purpose:**

The Montana Natural Heritage Program's Wetland and Riparian Mapping Center uses the Cowardin classification system (Cowardin et al. 1979) adopted by the National Wetland Inventory (NWI) for wetlands mapping (FGDC Wetlands Subcommittee 2009). The Cowardin wetland classification system separates wetlands first into systems, and then further separates systems into subsystems and classes.

A coding convention using letters and numbers is assigned to each mapped wetland. These letters and numbers describe the broad landscape context of the wetland, its vegetation type, its water regime, and the kind of alterations that may have occurred. Similar coding, based on U.S. Fish and Wildlife Service (USFWS) conventions, is applied to riparian areas (U.S. Fish and Wildlife Service 2009). These are mapped areas where vegetation composition and growth is influenced by nearby water bodies but where soils, plant communities, and hydrology do not display true wetland characteristics.

Both of these classification systems are described in more detail below. Classification types listed are followed by the coding convention used for mapping purposes.

#### **Wetlands**

In Montana, there are three wetland systems: **Palustrine**, **Lacustrine**, and **Riverine**.

#### **Riparian**

In Montana, there is one classification system for **Riparian** areas.

#### **PALUSTRINE SYSTEM (P):**

- In Montana, this system includes all wetlands dominated by trees, shrubs, and emergent, herbaceous vegetation.
- Wetlands lacking vegetation are also included in this system if they are less than 8 hectares (20 acres) in size and are less than 2 meters (6.6 feet) deep in the deepest portion of the wetland.

#### **Palustrine Classes:**

Within the Palustrine System, seven classes of wetlands occur in Montana. Classes distinguish between substrate types or vegetation, or both. The wetland classes typically mapped in Montana include the following:

##### **Rock Bottom (RB):**

- Wetlands with a substrate made up of 75% or greater stones, boulders, and bedrock with less than 30% vegetation cover.

##### **Unconsolidated Bottom (UB):**

- Wetlands where mud, silt or similar fine particles cover at least 25% of the bottom, and where vegetation cover is less than 30%.

##### **Amphibious Bed (AB):**

# Map Viewer Summarize Data

Summarize data by: state, county, quad, watershed, township, section

NATURAL HERITAGE MAP VIEWER Scale 1:18,023  
mt.gov Field Guide File View Help Sign In Standard Controls

Task Selection  
NHP Wetland and Riparian Mapping  
"Tasks" are different sets of Data, Tools, and Map Layers.  
Switch Task Reset Map

Tools  
Show Wetland and Riparian  
Click to show Wetland and Riparian Legend

Summarize Wetland and Riparian By  
County  
 Show Summarize Boundaries  
See Current Status of NWI Mapping

Map Layers  
 Show Summarize Boundaries  
 Land Management >>  
 Wetland and Riparian Mapping Status >>  
 Wetland and Riparian (historic) >>  
 Wetland and Riparian >>  
 Lakes and Streams >>  
 Counties >>  
 Township, Range & Section >>  
 Roads >>  
 Towns >>  
 LL, QLL, QQLL >>

NHP Wetland and Riparian Mapping

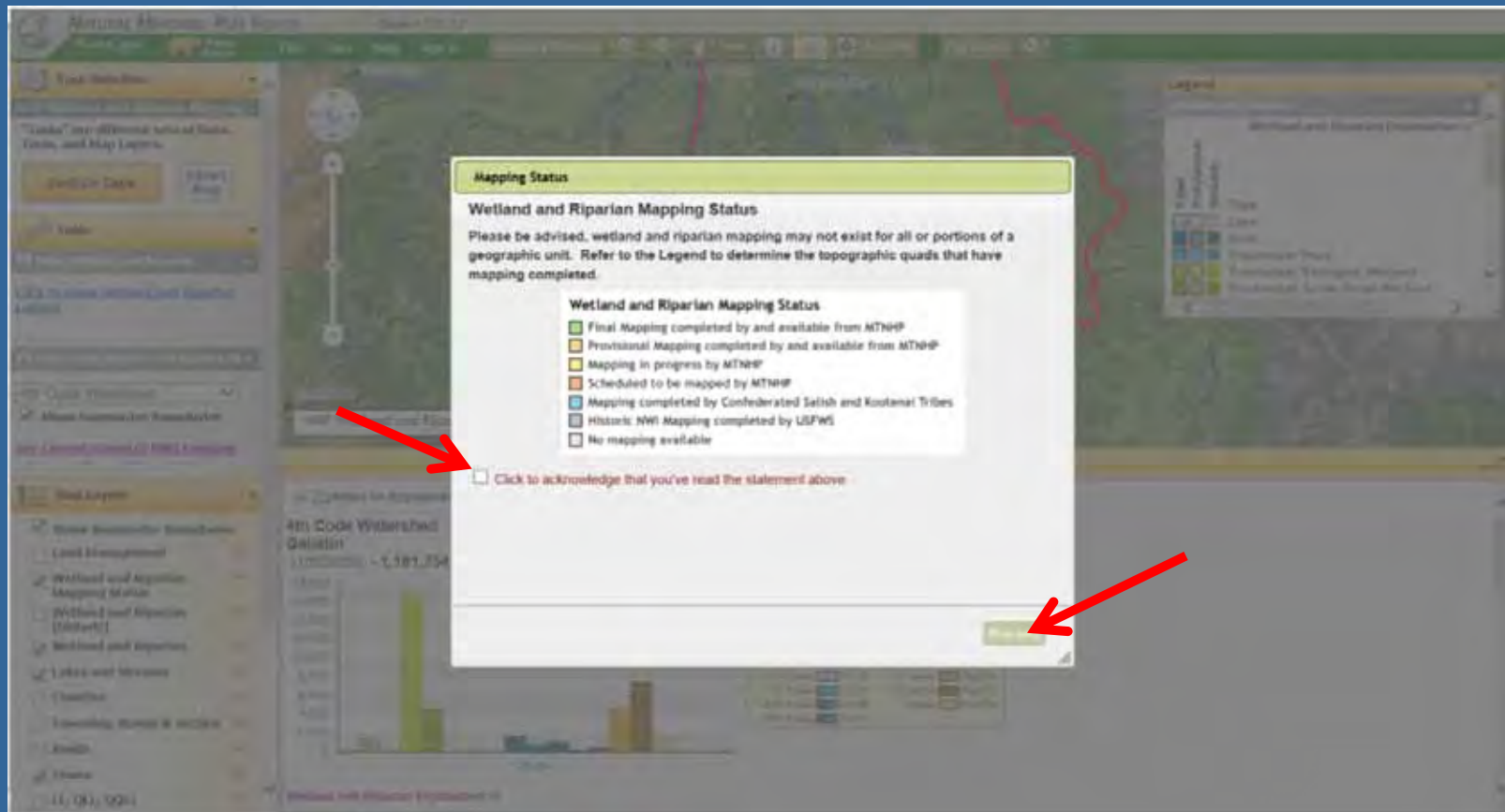
Click on map to summarize



# Map Viewer Summarize Data

## Summarize Data

- Review and acknowledge mapping status statement



# Map Viewer Summarize Data

- Acreage by type and modification
- Export map to jpg or pdf: Click “File, “Export map to jpg/pdf”
- Print report to jpg or pdf

The screenshot displays the 'NATURAL HERITAGE MAP VIEWER' interface. The top navigation bar includes 'File', 'View', 'Help', and 'Sign In'. A red arrow points to the 'File' menu. The main map area shows the Gallatin watershed with a red boundary. A legend on the right explains wetland and riparian types. Below the map is a 'Charts and Data' section with a bar chart titled '4th Code Watershed Gallatin (10020000) - 1,181,754 Acres (1.26% of Montana)'. A red arrow points to the 'Printable Report' link below the chart.

**Legend: Wetland and Riparian Explanation**

Final	Provisional	Historic	Type
[Light Blue]	[Dark Blue]	[Light Green]	Lake
[Light Blue]	[Dark Blue]	[Light Green]	River
[Light Blue]	[Dark Blue]	[Light Green]	Freshwater Pond
[Light Blue]	[Dark Blue]	[Light Green]	Freshwater Emergent Wetland
[Light Blue]	[Dark Blue]	[Light Green]	Freshwater Scrub-Shrub Wetland

**Charts and Data**

Notes on Appropriate Uses of Wetland and Riparian Mapping

**4th Code Watershed Gallatin (10020000) - 1,181,754 Acres (1.26% of Montana)**

172 Acres	PUR	1,109 Acres	R3U9
1,451 Acres	PAB	125 Acres	R3U6
54 Acres	PUS	472 Acres	R45B
16,801 Acres	PEM	4,661 Acres	Rp155
4,581 Acres	P35	7,806 Acres	Rp150
18 Acres	PFD	1,520 Acres	Rp159
291 Acres	L1UR	10 Acres	Rp255
14 Acres	L2UR	12 Acres	Rp250
1,824 Acres	R2U9	1 Acres	Rp259
688 Acres	R2U8		

Wetland and Riparian Explanation

[Printable Report](#)

Final and Provisional Mapping Summary

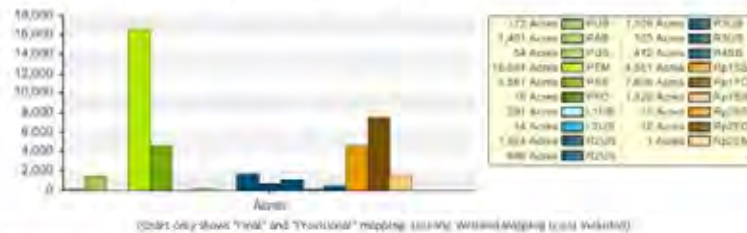
# Map Viewer Summarize Data

Print mapping and report to jpg or pdf



## Montana Wetland and Riparian Mapping Summary Report generated 5/7/2014 12:16:28 PM

### Notes on Appropriate Uses of Wetland and Riparian Mapping



### Wetland and Riparian Explanation of

**4th Code Watershed**  
**Gallatin**  
**(10020008) - 1,181,754 Acres (1.26% of Montana)**

### Final and Provisional Mapping Summary

*Final and Provisional Mapping represents wetland and riparian mapping created from 2005 or later aerial imagery. (show more)*

Code	Description	Acres
P1UB	Decomposition Wetland	1,172
P1UB	Wetland/Thal	1,029
P1UB	Decomposition Wetland	1,481
P1UB	Wetland/Thal	103
P1UB	Wetland/Thal	54
P1UB	Wetland/Thal	342
P1UB	Wetland/Thal	16,887
P1UB	Wetland/Thal	4,551
P1UB	Wetland/Thal	6,287
P1UB	Wetland/Thal	7,808
P1UB	Wetland/Thal	16
P1UB	Wetland/Thal	1,520
P1UB	Wetland/Thal	391
P1UB	Wetland/Thal	1,118
P1UB	Wetland/Thal	11
P1UB	Wetland/Thal	14
P1UB	Wetland/Thal	12
P1UB	Wetland/Thal	1,804
P1UB	Wetland/Thal	1
P1UB	Wetland/Thal	888

# Accessing Mapping

## View or Download for GIS

<http://mtnhp.org/NWI>

### Overview

Wetlands and riparian areas are one of the 14 themes in the [Montana Spatial Data Infrastructure \(MSDI\)](#), and our goal is to create a statewide digital wetland and riparian layer as a resource for management, planning, and restoration efforts.

With support from the Montana Wetland Council and our other partners, the Center maps wetlands and riparian areas to [EGDC](#) and [USEWS](#) National Wetlands Inventory (NWI) standards.

Additionally, wetland mapping can be enhanced by incorporating descriptors to characterize hydrogeomorphic features to identify potential wetland function. These descriptors are added to each wetland polygon to describe the landscape position, landform, water flow path, and waterbody type ([LWW](#)).

Digital wetland mapping is necessary to effectively and efficiently [assess Montana's wetlands](#) by identifying the type, size, and location of wetland resources.

### Wetland and Riparian Mapping Center

- [Wetland and Riparian Mapping Status](#)
- [Natural Heritage Map Viewer-Wetland and Riparian Mapping](#)
- [View & Download Wetlands Data](#)
- [National Wetlands Inventory Guide](#)

### Other Information

- [View Ecology Information](#)
- [View Aquatic Information](#)
- [Land Stewardship Mapping](#)
- [View Plant Information](#)
- [View Animal Information](#)
- [Submit Observations](#)
- [Request Information](#)



View an example of Montana wetland and riparian mapping.

### Mapping Status



### Partners Map



### Related Links

- [Wetland & Riparian Mapping Fact Sheet](#)
- [National Spatial Data Infrastructure \(NSDI\) Wetlands Layer](#)
- [Montana Wetland Information Clearinghouse](#)
- [USFWS National Wetlands Inventory \(NWI\)](#)
- [USFWS NWI Riparian Mapping](#)
- [Confederated Salish & Kootenai Tribes Wetlands Conservation Program](#)
- [Montana Geographic Information](#)
- [US EPA Wetlands Info](#)

### Mapping Status by Watershed



Stay Connected  

[Privacy & Security](#) [Accessibility](#) [Contact Us](#) [Search](#)



# View or Download for GIS

<http://geoinfo.montanastatelibrary.org/data/msdi/wetlands/>

**MONTANA.GOV**  
OFFICIAL STATE WEBSITE

SERVICES AGENCIES LOGIN SEARCH

## Geographic Information

Providing Montana a sense of place

MSDI Data Geography Web Changes

Home » Data » Montana Spatial Data Infrastructure (MSDI) » Wetlands

### Wetlands

#### Data and Documentation

**Wetlands Data Download for Desktop GIS Users**  
Spatial data representing the extent, type, and approximate location of wetlands, riparian areas, and deepwater habitats in Montana along with associated metadata are provided in geodatabase versions 10 or 9.3. Data are downloaded at a statewide scale. New data are added as individual project areas are completed.

#### Applications

**Wetland and Riparian Framework Web Service**  
This application provides access to the Montana Spatial Data Infrastructure Framework dataset. Included in this service are provisional and final wetland and riparian polygons and labels, the wetland and riparian mapping program status map, and historic wetland mapping polygons and labels completed by the National Wetland Inventory.

#### Wetlands Framework Contact Information

**Wetlands Framework Theme Leads**

**Karen Newlon**  
Montana Natural Heritage Program  
Ecologist/Project Manager  
Email: [knewlon@mt.gov](mailto:knewlon@mt.gov)  
Phone: 406-444-0915

**Lynda Saul**  
Department of Environmental Quality  
Wetland Program Coordinator  
Email: [lsaul@mt.gov](mailto:lsaul@mt.gov)  
Phone: 406-444-6652

**Wetlands Framework Theme Stewards**

Montana Natural Heritage Program

**Download data**

**View Map Service Layer in a GIS**

# View Using Map Service in GIS

Click Save, use the drop down arrow to “Save As”  
Save with your ArcMap layers, add layer to your map

ArcGIS Services Directory [Login](#) | [Get Token](#)

[Home](#) > [MSDI\\_Framework](#) > [WetlandsRiparian \(MapServer\)](#) [Help](#) | [API Reference](#)

## MSDI\_Framework/WetlandsRiparian (MapServer)

View In: [ArcMap](#) [ArcGIS Explorer](#) [ArcGIS JavaScript](#) [Google Earth](#) [ArcGIS.com Map](#)

View Footprint In: [Google Earth](#)

**Service Description:** The WetlandsRiparian Web Map Service provides access to the Montana Spatial Data Infrastructure (MSDI) Wetlands and Riparian Framework dataset. Included in this service are the wetlands and riparian mapping program status map as well as historic, provisional and final wetlands polygon, outline, and labels. Metadata and access to the datasets that support this service is available through the Montana GIS Portal - <http://gisportal.msl.mt.gov> Additional information about these data sets and information about the Montana Wetlands and Riparian Center is available at - <http://mtnhp.org/nwi/>

**Map Name:** Layers

[Legend](#)

[All Layers and Tables](#)

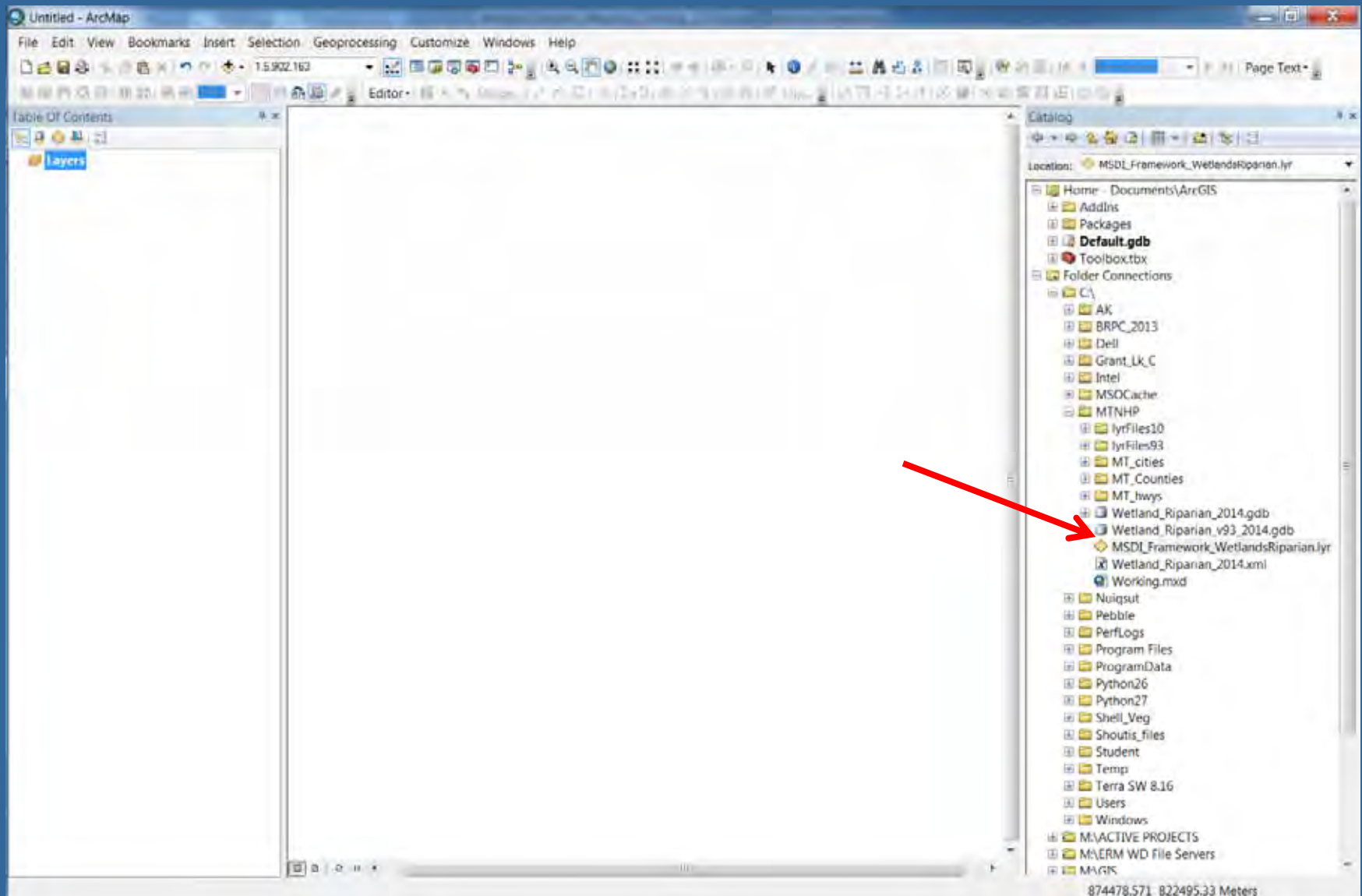
**Layers:**

- [Wetland and Riparian Mapping](#) (0)
  - [Labels](#) (1)
  - [Mapping Status](#) (2)
  - [Wetland and Riparian Mapping](#) (3)
- [Historic NWI Mapping](#) (4)
  - [Labels](#) (5)
  - [Historic Mapping Outline](#) (6)
  - [Historic NWI Mapping](#) (7)
- [Wetland and Riparian Mapping Status](#) (8)
  - [Active Projects](#) (9)
  - [Quads with Final Mapping](#) (10)
  - [Quads with Provisional Mapping](#) (11)
  - [Historic NWI](#) (12)
  - [No Mapping A](#)

Do you want to open or save MSDI\_Framework\_WetlandsRiparian.lyr (4.00 KB) from [gisservice.mt.gov](http://gisservice.mt.gov)?

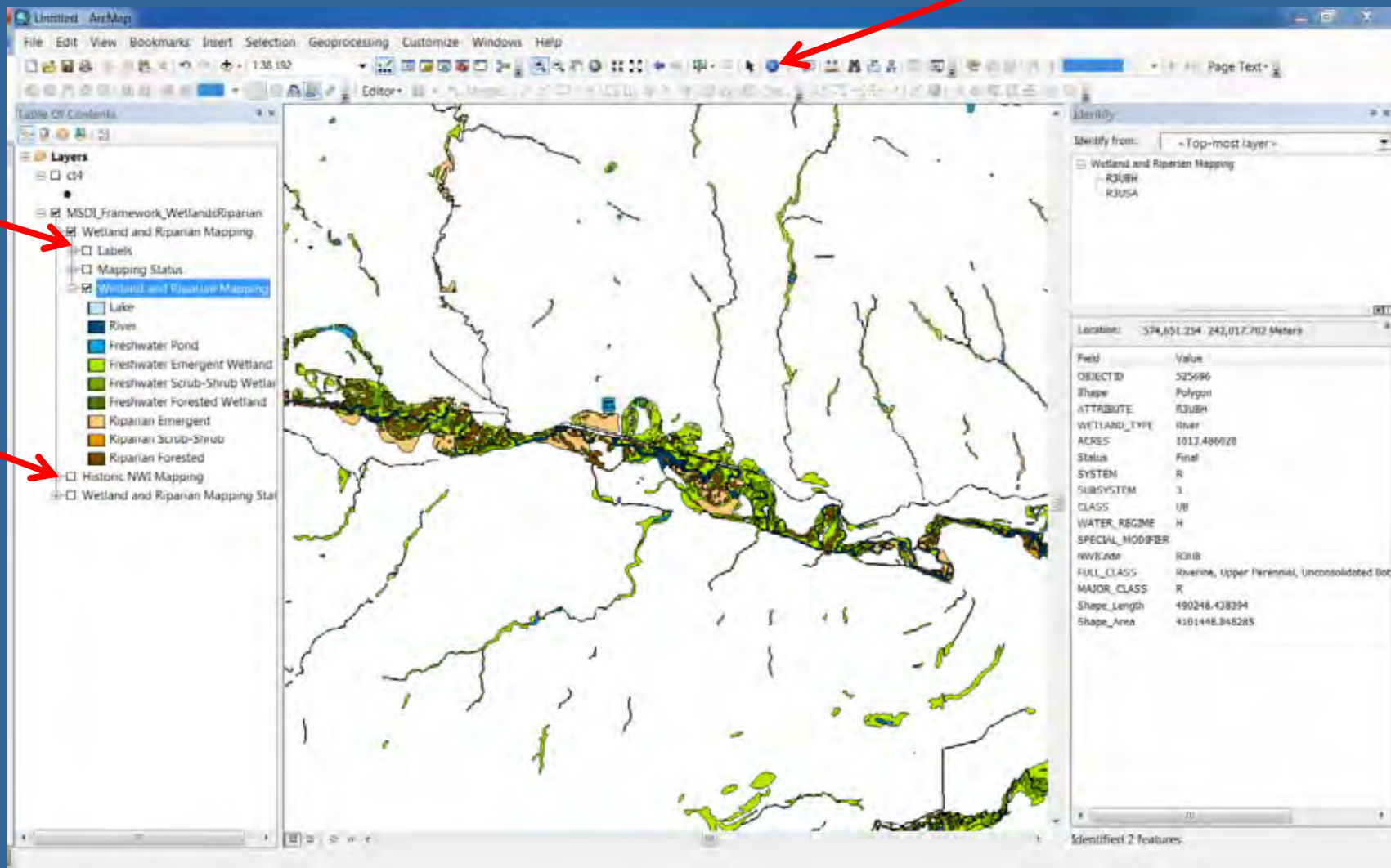
# View Using MapService in GIS

Add layer to the map, “MSDI\_Framework\_WetlandsRiparian.lyr”



# View Using MapService in GIS

- Zoom to area of interest to view mapping
- Use **“Identify”** tool to explore attributes





# Download for GIS

<http://geoinfo.montanastatelibrary.org/data/msdi/wetlands/>

MONTANA.GOV  
OFFICIAL STATE WEBSITE

SERVICES AGENCIES LOGIN SEARCH

## Geographic Information

Providing Montana a sense of place

MSDI Data Geography Web Changes


Home » Data » Montana Spatial Data Infrastructure (MSDI) » Wetlands

### Wetlands

#### Data and Documentation

**Wetlands Data Download for Desktop GIS Users**

Spatial data representing the extent, type, and approximate location of wetlands, riparian areas, and deepwater habitats in Montana along with associated metadata are provided in geodatabase versions 10 or 9.3. Data are downloaded at a statewide scale. New data are added as individual project areas are completed.



#### Applications

**Wetland and Riparian Framework Web Service**

This application provides access to the Montana Spatial Data Infrastructure (MSDI) Wetlands and Riparian Framework dataset. Included in this service are provisional and final wetland and riparian polygons and labels, the wetland and riparian mapping program status map, and historic wetland mapping polygons and labels completed by the National Wetland Inventory.

#### About

### Wetlands Framework Contact Information

**Wetlands Framework Theme Leads**

**Karen Newlon**  
Montana Natural Heritage Program  
Ecologist/Project Manager  
Email: [knewlon@mt.gov](mailto:knewlon@mt.gov)  
Phone: 406-444-0915

**Lynda Saul**  
Department of Environmental Quality  
Wetland Program Coordinator  
Email: [lsaul@mt.gov](mailto:lsaul@mt.gov)  
Phone: 406-444-6652

**Wetlands Framework Theme Stewards**

**Montana Natural Heritage Program**

# Download for GIS

## Montana State Data Infrastructure (MSDI)

The screenshot shows the Montana State Data Infrastructure (MSDI) website. At the top left is the logo for MONTANA.GOV OFFICIAL STATE WEBSITE. To the right are links for SERVICES, AGENCIES, LOGIN, and a SEARCH box. Below the header is a banner for Geographic Information with the tagline 'Providing Montana a sense of place' and the Montana State Library logo. A navigation bar contains links for MSDI, Data, Geography, and Web Changes. A breadcrumb trail reads 'Home > Data > Data List > Data List Details'. The main heading is 'Montana Wetland and Riparian Framework • MSDI'. A red circle highlights the 'Download Data' button. Below this are details for the data provider (Montana Natural Heritage Program (MTNHP)), date (03/14/2014), and content type (Downloadable Data). A tabbed interface shows the 'Description' tab selected, with an abstract describing the wetland and riparian framework. To the right, there is a 'Data List Quick Search' box with a search input and a 'Go' button, and a 'Data Categories' list including Montana Spatial Data Infrastructure (MSDI), Biota, Boundaries, Climatology/Meteorology/Atmosphere, Economy, Elevation, Environment, Farming, Geoscientific Information, and Health.

MONTANA.GOV  
OFFICIAL STATE WEBSITE

SERVICES AGENCIES LOGIN SEARCH

### Geographic Information

Providing Montana a sense of place

MSDI Data Geography Web Changes

Home > Data > Data List > Data List Details

## Montana Wetland and Riparian Framework • MSDI

**Download Data**

Data Provider: Montana Natural Heritage Program (MTNHP)

Date: 03/14/2014

Content Type: Downloadable Data

**Description** Usage Distribution Metadata

**ABSTRACT**

The Montana Wetland and Riparian Framework represents the extent, type, and approximate location of wetlands, riparian areas, and deepwater habitats in Montana. These data delineate the areal extent of wetlands and deepwater habitats as defined by Cowardin et al. (1979) and riparian areas as defined by the U.S. Fish and Wildlife Service (2009).

The Montana Wetland and Riparian Framework consists of features that were manually digitized at a scale of 1:4,500 or 1:5,000 from orthorectified digital color-infrared aerial imagery collected during the summers of 2005, 2006, 2009, 2011, and 2013 by the National Agricultural Imagery Program (NAIP). These data are intended for use in publications at a scale of 1:12,000 or smaller.

### Data List Quick Search

Search by single word or exact phrase  
Advanced Search

Go

- Browse Full Data List
- Help

### Data Categories

- Montana Spatial Data Infrastructure (MSDI)
- Biota
- Boundaries
- Climatology/Meteorology/Atmosphere
- Economy
- Elevation
- Environment
- Farming
- Geoscientific Information
- Health

# Download for GIS

Download zip file for your version of ArcGIS

FTP directory /Data/Spatial/MSDI/Wetlands at ftp.geoinfo.msl.mt.gov

To view this FTP site in File Explorer: press Alt, click View, and then click Open FTP Site in File Explorer.

[Up to higher level directory](#)

03/21/2014 03:33PM	345,696,445	<a href="#">Wetland Riparian 2014.zip</a>
03/21/2014 03:37PM	345,392,438	<a href="#">Wetland Riparian v93 2014.zip</a>

ArcGIS 10.x users

ArcGIS 9.3 users

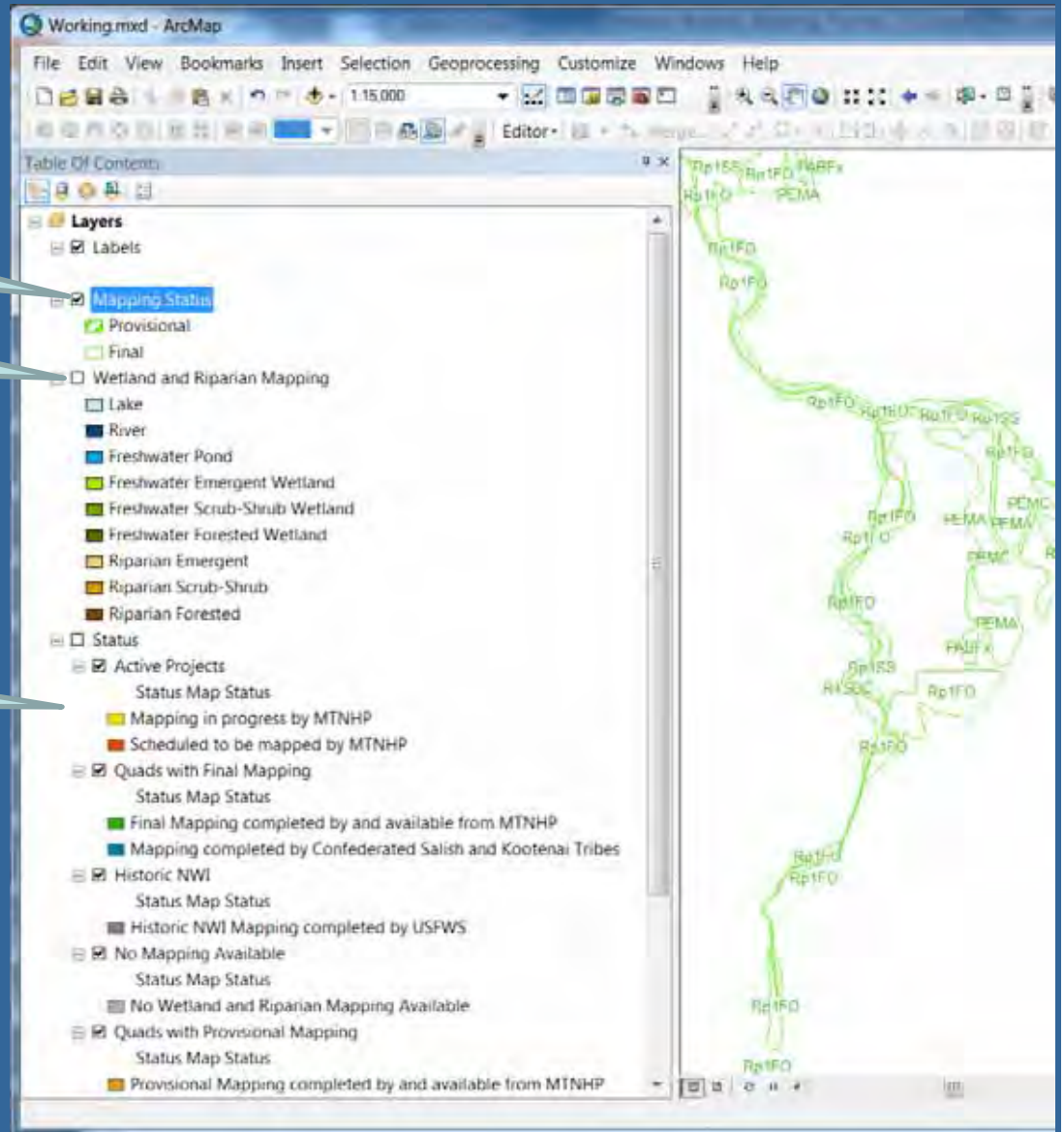
# Download for GIS

## Using Mapping in ArcGIS

Status by polygon

Mapping by polygon  
(provisional or final only)

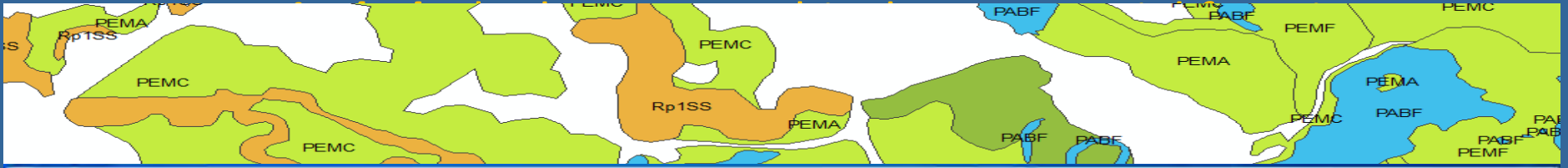
Mapping status by quad



# Download for GIS

## Attribute table

- Includes NWI coding (vegetation, water regime, alterations)

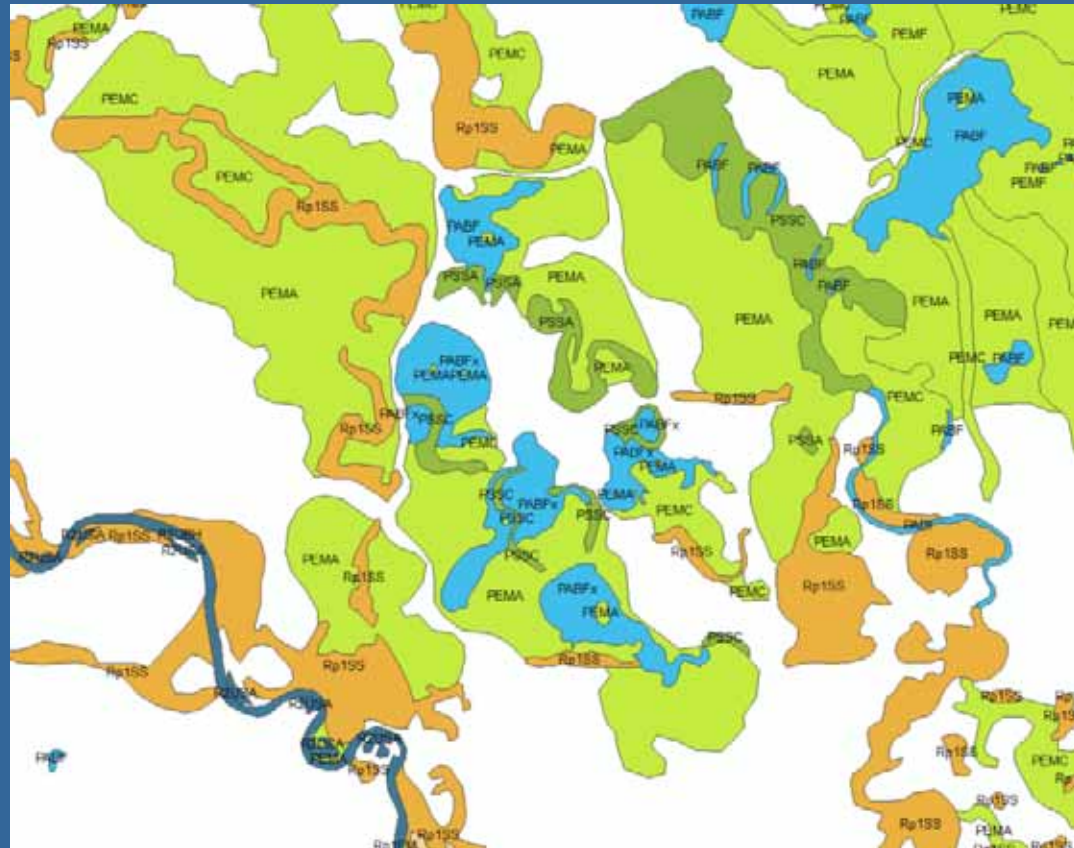


Wetland and Riparian Mapping

WETLAND TYPE	ATTRIBUTE	ACRES	Status	SYSTEM	SUBSYSTEM	CLASS	WATER REG	SPECIAL MODIFIER	NWCode	FULL CLASS	M
River	R3UBF	28.003481	Final	R	3	UB	F		R3UB	Riverine, Upper Perennial, Unconsolidated Bottom, Semipermanently Flooded	R
Freshwater Emergent Wetland	PEMA	2.052434	Final	P		EM	A		PEM	Palustrine, Emergent, Temporarily Flooded	P
Freshwater Pond	PABFh	0.074808	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
River	R3UBF	18.250269	Final	R	3	UB	F		R3UB	Riverine, Upper Perennial, Unconsolidated Bottom, Semipermanently Flooded	R
Freshwater Emergent Wetland	PEMA	0.217019	Final	P		EM	A		PEM	Palustrine, Emergent, Temporarily Flooded	P
River	R4SBCx	27.438884	Final	R	4	SB	C	x	R4SB	Riverine, Intermittent, Streambed, Seasonally Flooded, Excavated	R
Freshwater Pond	PABFh	0.333811	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
River	R4SBCx	40.464602	Final	R	4	SB	C	x	R4SB	Riverine, Intermittent, Streambed, Seasonally Flooded, Excavated	R
Freshwater Pond	PABFh	0.162224	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
Freshwater Pond	PABFh	0.085555	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
Freshwater Pond	PABFh	0.213669	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
Freshwater Pond	PABFh	0.026285	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
Freshwater Emergent Wetland	PEMA	4.03685	Final	P		EM	A		PEM	Palustrine, Emergent, Temporarily Flooded	P
Freshwater Pond	PABFh	0.062419	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
Freshwater Pond	PABFh	0.028559	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
River	R4SBCx	125.079108	Final	R	4	SB	C	x	R4SB	Riverine, Intermittent, Streambed, Seasonally Flooded, Excavated	R
River	R4SBCx	26.20464	Final	R	4	SB	C	x	R4SB	Riverine, Intermittent, Streambed, Seasonally Flooded, Excavated	R
Freshwater Pond	PABFh	0.082709	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
Freshwater Pond	PABFh	0.151048	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
Freshwater Pond	PABFh	0.797061	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
Freshwater Emergent Wetland	PEMC	0.142154	Final	P		EM	C		PEM	Palustrine, Emergent, Seasonally Flooded	P
Freshwater Pond	PABFh	0.219671	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
Freshwater Pond	PABFh	0.293706	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
Freshwater Pond	PABFh	0.080454	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
River	R3UBF	9.735145	Final	R	3	UB	F		R3UB	Riverine, Upper Perennial, Unconsolidated Bottom, Semipermanently Flooded	R
Freshwater Emergent Wetland	PEMB	0.893598	Final	P		EM	B		PEM	Palustrine, Emergent, Saturated	P
River	R3UBF	4.516137	Final	R	3	UB	F		R3UB	Riverine, Upper Perennial, Unconsolidated Bottom, Semipermanently Flooded	R
Freshwater Pond	PABFh	0.277586	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
Freshwater Pond	PABFh	1.116554	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P

Wetland and Riparian Mapping

# Questions?



# Training Overview

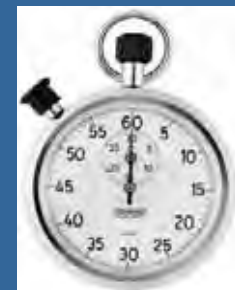
- Definition of wetland and riparian areas
- What is wetland and riparian mapping?
- Mapping programs and status
- How mapping is created, limitations
- Classification systems
- Accessing mapping
- **Hands-on mapping activity**
- Uses and examples



# Mapping Activity

## Directions

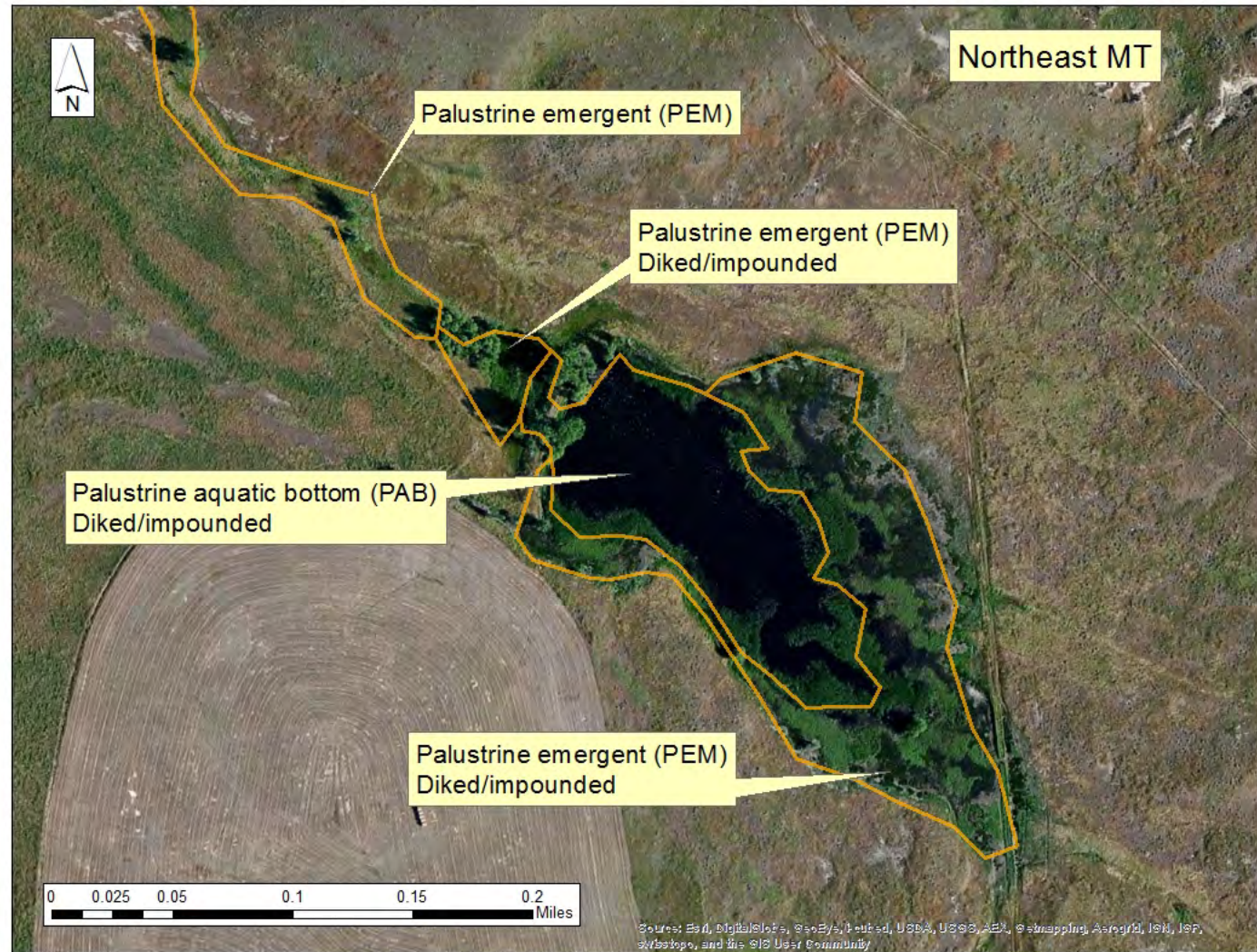
- Outline potential wetland types
- Add wetland classification



20 minutes



# Mapping Activity



# Training Overview

- Definition of wetland and riparian areas
- What is wetland and riparian mapping?
- Mapping programs and status
- How mapping is created, limitations
- Classification systems
- Accessing mapping
- Hands-on mapping activity
- **Uses and examples**



# Potential Uses

- Preliminary site assessment
- General data management
- Land use planning
- Floodplain management
- Riparian setbacks
- NEPA process
- Project permitting
- Project facilities siting
- CWA Section 404 Permitting
- Assessing wetland function
- Restoration planning
- Monitoring plan development
- Evaluate watershed-scale wetland losses/gains
- Habitat assessment
- Conservation planning
- Fisheries protection
- Water quality protection

# General Use Data Management

GIS layer can be used as the geodatabase to house any wetland/riparian data set

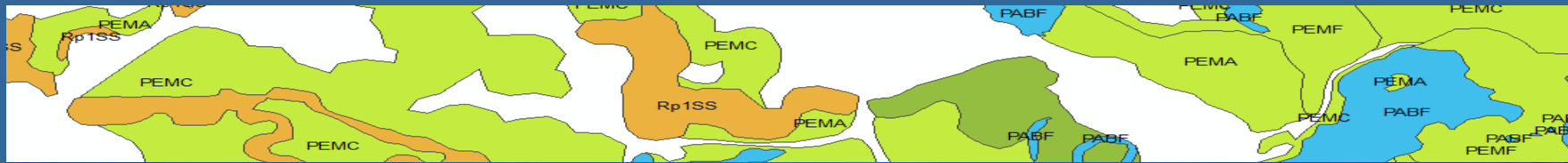


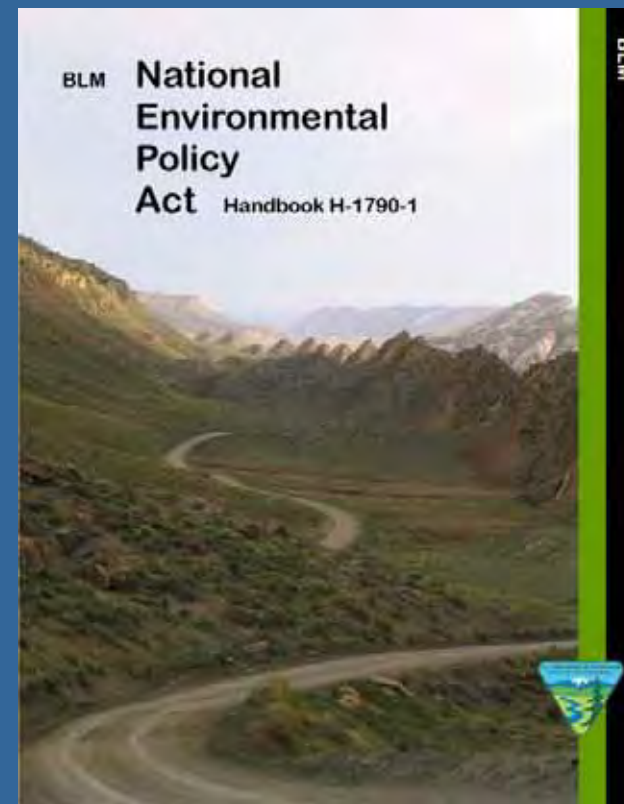
Table  
Wetland and Riparian Mapping

	WETLAND TYPE	ATTRIBUTE	ACRES	Status	SYSTEM	SUBSYSTEM	CLASS	WATER REG.	SPECIAL MODIFIER	NWCode	FULL CLASS	M
	River	R3UBF	28.003481	Final	R	3	UB	F		R3UB	Rivine, Upper Perennial, Unconsolidated Bottom, Semipermanently Flooded	R
	Freshwater Emergent Wetland	PEMA	2.052434	Final	P		EM	A		PEM	Palustrine, Emergent, Temporarily Flooded	P
	Freshwater Pond	PABFh	0.074808	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
	River	R3UBF	18.250269	Final	R	3	UB	F		R3UB	Rivine, Upper Perennial, Unconsolidated Bottom, Semipermanently Flooded	R
	Freshwater Emergent Wetland	PEMA	0.217019	Final	P		EM	A		PEM	Palustrine, Emergent, Temporarily Flooded	P
	River	R4SBCx	27.430894	Final	R	4	SB	C	x	R4SB	Rivine, Intermittent, Streambed, Seasonally Flooded, Excavated	R
	Freshwater Pond	PABFh	0.333811	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
	River	R4SBCx	40.464602	Final	R	4	SB	C	x	R4SB	Rivine, Intermittent, Streambed, Seasonally Flooded, Excavated	R
	Freshwater Pond	PABFh	0.162224	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
	Freshwater Pond	PABFh	0.085555	Final	P		AB	F	n	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
	Freshwater Pond	PABFh	0.213669	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
	Freshwater Pond	PABFh	0.026285	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
	Freshwater Emergent Wetland	PEMA	4.02685	Final	P		EM	A		PEM	Palustrine, Emergent, Temporarily Flooded	P
	Freshwater Pond	PABFh	0.062419	Final	P		AB	F	a	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
	Freshwater Pond	PABFh	0.028559	Final	P		AB	F	x	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated	P
	River	R4SBCx	125.078108	Final	R	4	SB	C	x	R4SB	Rivine, Intermittent, Streambed, Seasonally Flooded, Excavated	R
	River	R4SBCx	26.20464	Final	R	4	SB	C	s	R4SB	Rivine, Intermittent, Streambed, Seasonally Flooded, Excavated	R
	Freshwater Pond	PABFh	0.982709	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
	Freshwater Pond	PABFh	0.151048	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
	Freshwater Pond	PABFh	0.797061	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
	Freshwater Emergent Wetland	PEMC	0.142194	Final	P		EM	C		PEM	Palustrine, Emergent, Seasonally Flooded	P
	Freshwater Pond	PABFh	0.219571	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
	Freshwater Pond	PABFh	0.293706	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
	Freshwater Pond	PABFh	0.080454	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
	River	R3UBF	9.735145	Final	R	3	UB	F		R3UB	Rivine, Upper Perennial, Unconsolidated Bottom, Semipermanently Flooded	R
	Freshwater Emergent Wetland	PEMB	0.893598	Final	P		EM	B		PEM	Palustrine, Emergent, Saturated	P
	River	R3UBF	4.516137	Final	R	3	UB	F		R3UB	Rivine, Upper Perennial, Unconsolidated Bottom, Semipermanently Flooded	R
	Freshwater Pond	PABFh	0.277586	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P
	Freshwater Pond	PABFh	1.118664	Final	P		AB	F	h	PAB	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	P

Wetland and Riparian Mapping

# Example Use NEPA Process

- Characterization of riparian and wetland habitat types and acreage for Affected Environment and Alternatives Analysis Sections
- To house environmental data and ancillary information
- Assessment of restoration and mitigation options



# Example Use

## Habitat Assessment

- Mapping fish and wildlife habitat
- Mapping T/E species habitat
- Prioritization of habitat conservation areas at local or regional scales
- Modeling/predicting potential suitable habitat for specific species
- USFWS North American Wetlands Conservation Act (NAWCA) Grants



# General Use Project Permitting

- Clean Water Act Section 404 Permit
- Facilities siting
- Stormwater discharge general permits (MPDES, SWPPP)
- Streamside Management Zone Law

**Guide to Required Permits**

Using the diagram above, determine where your project will take place: streambed, streambanks, wetlands, or floodplain. The letters in the diagram refer to the required permits listed below (A through L) and described on the following pages.

Permits that may be necessary:

- A. Montana Natural Streambed and Land Preservation Act (2110)
- B. Montana Stream Protection Act (SPA 174 Permit)
- C. City or County Floodplain Development Ordinance
- D. Federal Clean Water Act (404 Permit)
- I. Federal Rivers and Harbors Act (Section 10 Permit)
- E. Short-Term Water Quality Standard for Turbidity (T18 Authorization)
- G. Montana Land-Use License or Easement on Navigable Waters
- H. Montana Water Use Act (Water Right Permit and Change Authorization)
- L. Montana Water Use Act (Water Reservations)
- J. Stormwater Discharge General Permits
- K. Streamside Management Zone Law
- L. Other Laws that May Apply

# General Use Land Use Planning

- Identify natural resources, and potential hazards, in a planning area
- Prioritize appropriate zoning types: recreation, residential, commercial, industrial...
- Project facilities siting and permitting
- Assess potential development impacts

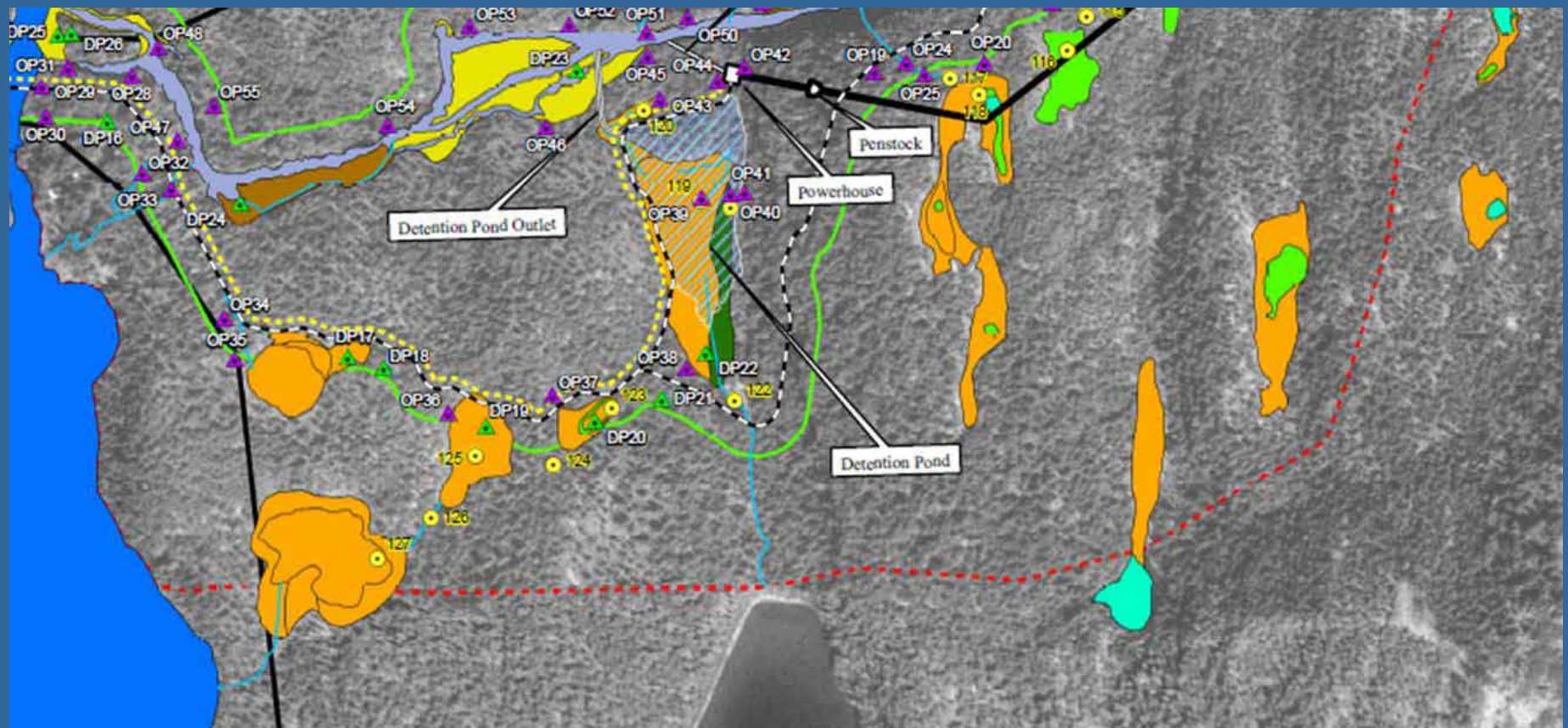




# Land Use Planning/Permitting Example

## Project Facilities Siting

- Assess siting of project infrastructure for permitting
- Example: using wetland mapping to assess best route for proposed road and power transmission line

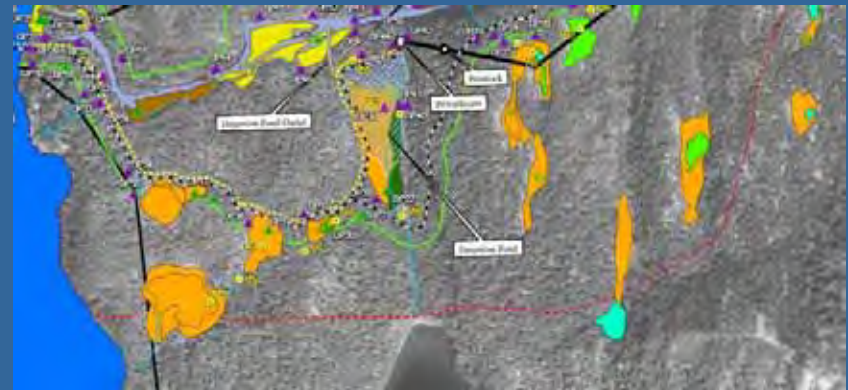


# Example Use

## CWA Section 404 Permitting

- Placement of fill in “Waters of the U.S.” requires CWA Section 404 permit
- Delineation of wetlands and waters
  - Pre-field desktop mapping
  - As base layer geodatabase for wetlands/waters data
- Wetland functional assessment for compensatory mitigation
  - As base layer geodatabase for functional data

*Final delineation and jurisdictional determination requires field groundtruthing*



# Example Use

## Floodplain Management and Planning

Floodplains are natural assets – keeping floodplains as open lands can:

- Save lives, reduce property damage, and avoid costs associated with building requirements
- Reduce environmental damage

FEMA FIRM maps don't always include all river hazard areas

- NWI mapping can be used to augment the FIRM maps to assess potential channel migration and river hazard areas

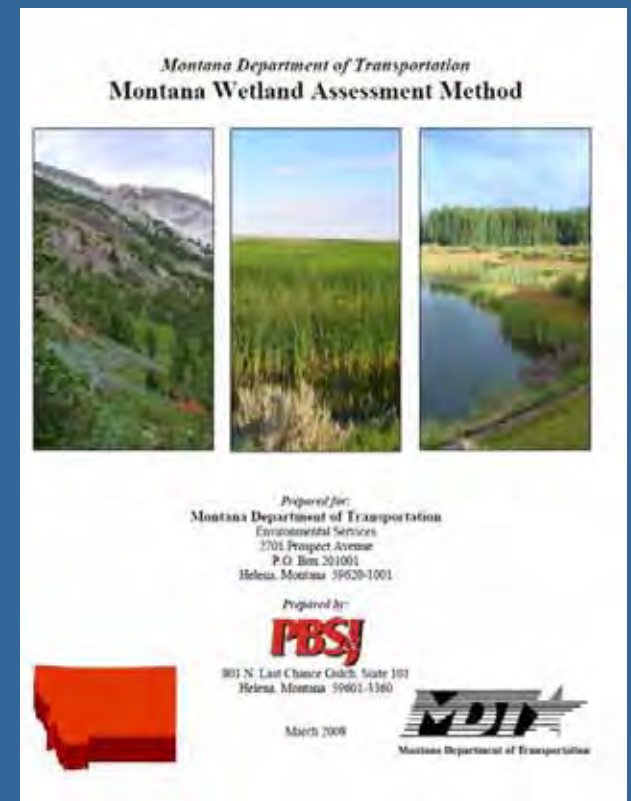


Photo credit: Varella 2013

# Example Use

## Assessing Wetland Function

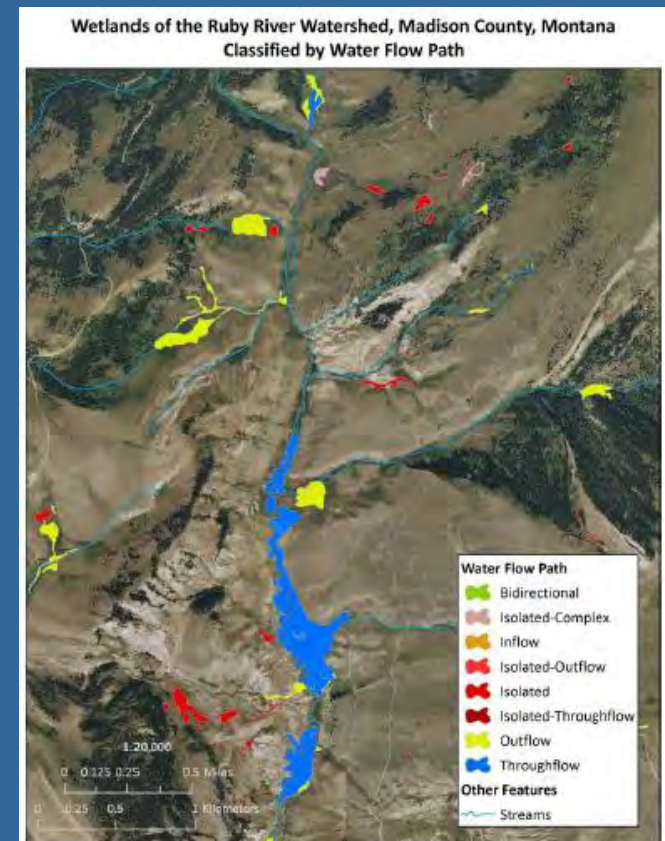
- Understanding potential wetland functions for mitigation, restoration prioritization, and conservation planning, i.e.:
  - Flood attenuation
  - Bank stabilization
  - Maintenance of flow
  - Sediment/nutrient retention
- Uses:
  - As base layer geodatabase for functional data (field or desktop data)
  - Landscape-scale assessment and modeling of potential functions in GIS



# Example Use

## Assessing Wetland Function

- Hydrogeomorphic characteristics are often used as surrogates to model potential functions at the landscape scale
- NWI uses LLWW descriptors for HGM information
  - *Landscape position*
  - *Landform*
  - *Water flow path*
  - *Waterbody type*
- **HGM is not currently part of the NWI mapping for MT**, but can be added by users
- MTNHP will be adding this data in the next few years



# Example Use: Water Quality Assessment and TMDL Planning

## Uses

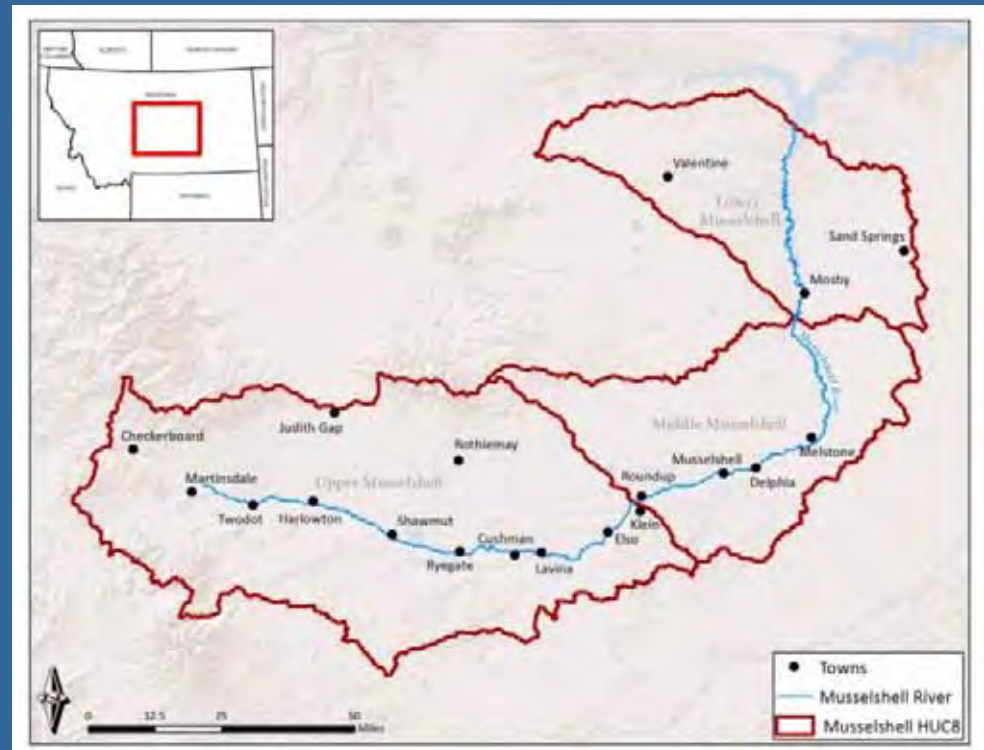
- Land Use/Land Cover characterization of watershed
- Assessment of natural loading sources
- Identification of source reduction areas (buffering)
- Assist in deriving model inputs for nutrient uptake, sediment retention, and potential shading in riparian areas



# Project Example

## Restoration Planning in the Musselshell Watershed

- DEQ pilot project to incorporate wetlands into watershed restoration planning
- Employ a “risk-based” approach to prioritize wetland restoration sites with the highest potential to mitigate impairments to water quality and quantity



# BLM Example Use: Assessing Proper Functioning Condition (PFC)

## RIPARIAN AREA MANAGEMENT

TR 1737-16 1999, Revised 2003

*A User Guide to Assessing Proper  
Functioning Condition and  
the Supporting Science for Lentic Areas*



U.S. Department of the Interior  
Bureau of Land Management



U.S. Department of Agriculture  
Forest Service

USDA NRCS

U.S. Department of Agriculture  
Natural Resources Conservation Service

## RIPARIAN AREA MANAGEMENT

TR 1737-15 1998

*A User Guide to Assessing Proper  
Functioning Condition and  
the Supporting Science for Lentic Areas*



U.S. Department of the Interior  
Bureau of Land Management



U.S. Department of Agriculture  
Forest Service

USDA NRCS

U.S. Department of Agriculture  
Natural Resources Conservation Service



# BLM Example Use: Assessing Proper Functioning Condition (PFC)

## Uses

- Pre-field landscape-level inventory of existing wetland and riparian resources
- GIS attribute table can house all PFC inventory and monitoring data (desktop and field data)
- As the GIS base layer to assess potential function and condition, and edit wetland/riparian boundaries

# BLM Example Use: Permitting and Monitoring of Grazing and Minerals Leases

## Uses

- Development of BLM permit stipulations and Resource Management Plans (e.g. Land Health Standards and BMP's)
- Water development planning: identify water resources for assessment of livestock distribution
- Initial pre-field work for BLM proper functioning condition assessment

# Data Management

## BLM Water Resources Inventory Project

Goal: Develop GIS geodatabase/layer to house:

- BLM Water Right data
- Lentic-wetland Proper Functioning Condition inventory and monitoring data

Solution:

- Linked NWI layer with DNRC Water Rights layer
- This layer could be expanded to house lentic PFC data (TBD)



# Summary

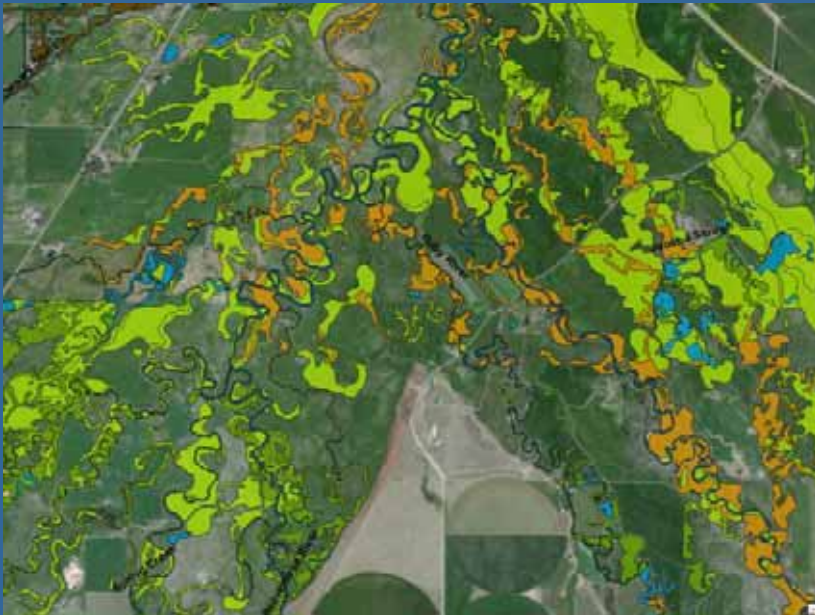
- Ideal for landscape or watershed scale assessment
- NWI is a starting point for more focused assessments requiring field verification
- Available from MTNHP before NWI web site
- Access method based on intended use and user skill level



# Questions?

Karen Newlon, Ecologist/PM  
MTNHP  
knewlon@mt.gov  
406-444-0915

Levia Shoutis, PWS  
ERM, Inc.  
levia.shoutis@erm.com  
406-222-7600



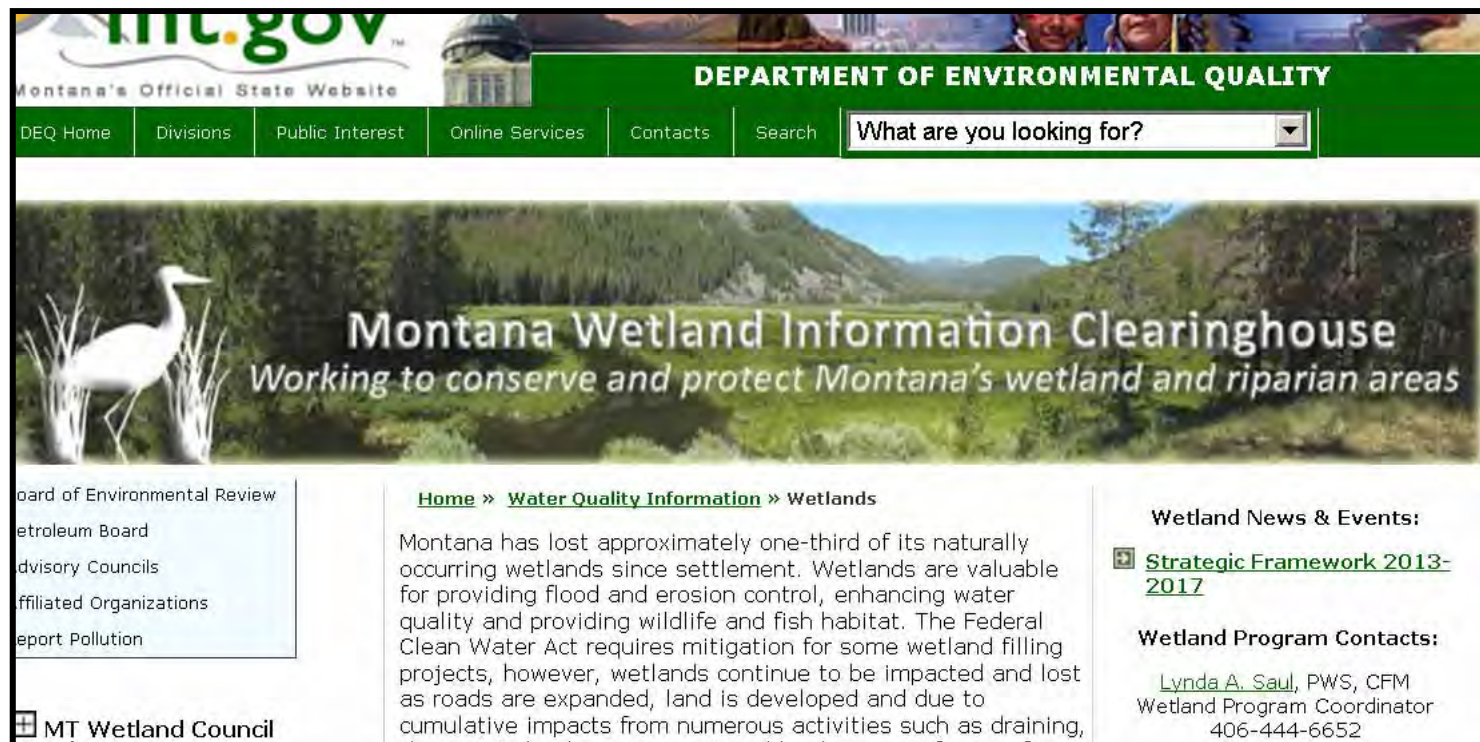
# Nine trainings + this webinar

- Helena. Montana Dept. Environmental Quality May 12, 2014
- Canyon Ferry. Montana Watershed Coordination Council. May 14
- Havre. June 25
- Helena. Floodplain Training. July 24
- Hamilton. MT Assoc. of Planners. September 17
- Bozeman. September 26
- Kalispell. MT American Water Resource Association. October 8
- Billings. November 6.
- Miles City. November 7
- Webinar. December 5, 2014

If you would like a wetland/riparian map training for your organization, contact Lynda Saul [lsaul@mt.gov](mailto:lsaul@mt.gov) or 406-444-6652.

# What's up next

- You will be emailed a survey through GoToWebinar
- Webinar series - January? Topics?
- Where to find the webinar <http://Wetlands.mt.gov>



The screenshot shows the Montana Department of Environmental Quality website. The header includes the logo for mt.gov and the text "Montana's Official State Website" and "DEPARTMENT OF ENVIRONMENTAL QUALITY". A navigation menu contains links for "DEQ Home", "Divisions", "Public Interest", "Online Services", "Contacts", and "Search". A search box contains the text "What are you looking for?". Below the navigation is a large banner image of a wetland with a white egret. The banner text reads "Montana Wetland Information Clearinghouse" and "Working to conserve and protect Montana's wetland and riparian areas".

Below the banner, there is a sidebar on the left with links: "Board of Environmental Review", "Petroleum Board", "Advisory Councils", "Affiliated Organizations", and "Report Pollution". The main content area has a breadcrumb trail: "Home » [Water Quality Information](#) » Wetlands". The main text states: "Montana has lost approximately one-third of its naturally occurring wetlands since settlement. Wetlands are valuable for providing flood and erosion control, enhancing water quality and providing wildlife and fish habitat. The Federal Clean Water Act requires mitigation for some wetland filling projects, however, wetlands continue to be impacted and lost as roads are expanded, land is developed and due to cumulative impacts from numerous activities such as draining,"

On the right side, there are two sections: "Wetland News & Events:" with a link to "[Strategic Framework 2013-2017](#)" and "Wetland Program Contacts:" with contact information for Lynda A. Saul, PWS, CFM, Wetland Program Coordinator, 406-444-6652.

At the bottom left, there is a logo for the MT Wetland Council.