Bridges and Culverts
Permitting Considerations

Michigan Department of Environmental Quality
Water Resource Division
Transportation and Flood Hazard Unit

Why, When, and Where

Part 301 Inland Lakes and Streams

- a natural or artificial lake, pond, or impoundment; a river, stream, or creek which may or may not be serving as a drain as defined by the drain code of 1956, 1956 PA 40, MCL 280.1 to 280.630;

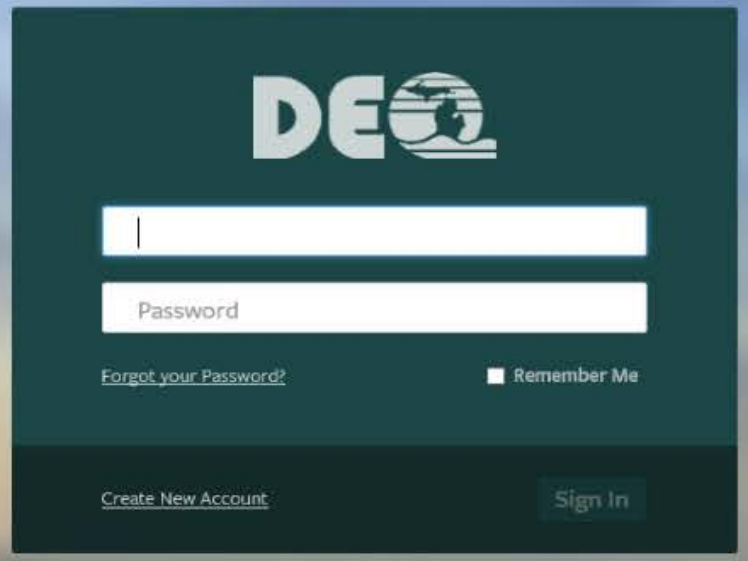
- or any other body of water that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water, including the St. Marys, St. Clair, and Detroit rivers.

Wetland-stream complex

Home About Contact Sign In MI.gov Home

DEQ MiWaters Water Resources Information and Forms

MiWaters – Water Resources Information and Forms
Create and manage Permit Applications and Service Requests



Request a Voluntary Transportation Preliminary Review Request

MI.gov Home MiWaters Home Contact Policies Copyright 2018 State of Michigan

https://miwaters.deq.state.mi.us/miwaters/#/external/home

Bridges and Culverts Additional Permitting Considerations

- Recreational uses
- Fisheries values
- Designated natural rivers (State or Federal)
- Threatened or endangered species
- Water quality in general

United States Fish and Wildlife Service
T&E Species Review

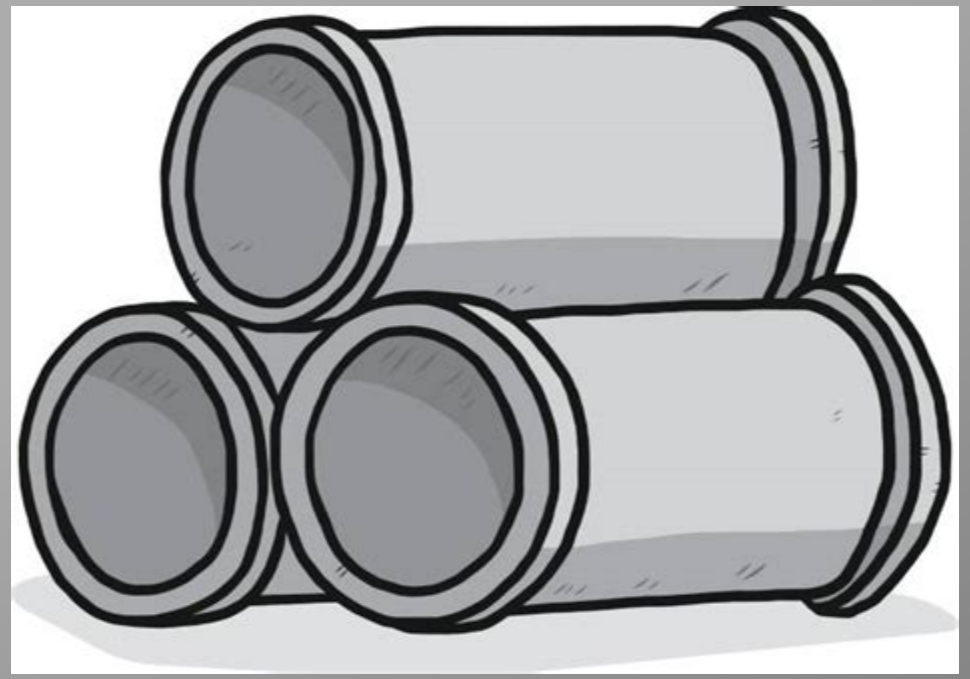
- Avoid **Red Files**
- Quicker DEQ permit review
- Less Delays
- Early Coordination IPaC Process

https://ecos.fws.gov/ipac/location/index

Scour hole downstream

Upstream Sedimentation

Perched Culvert above streambed



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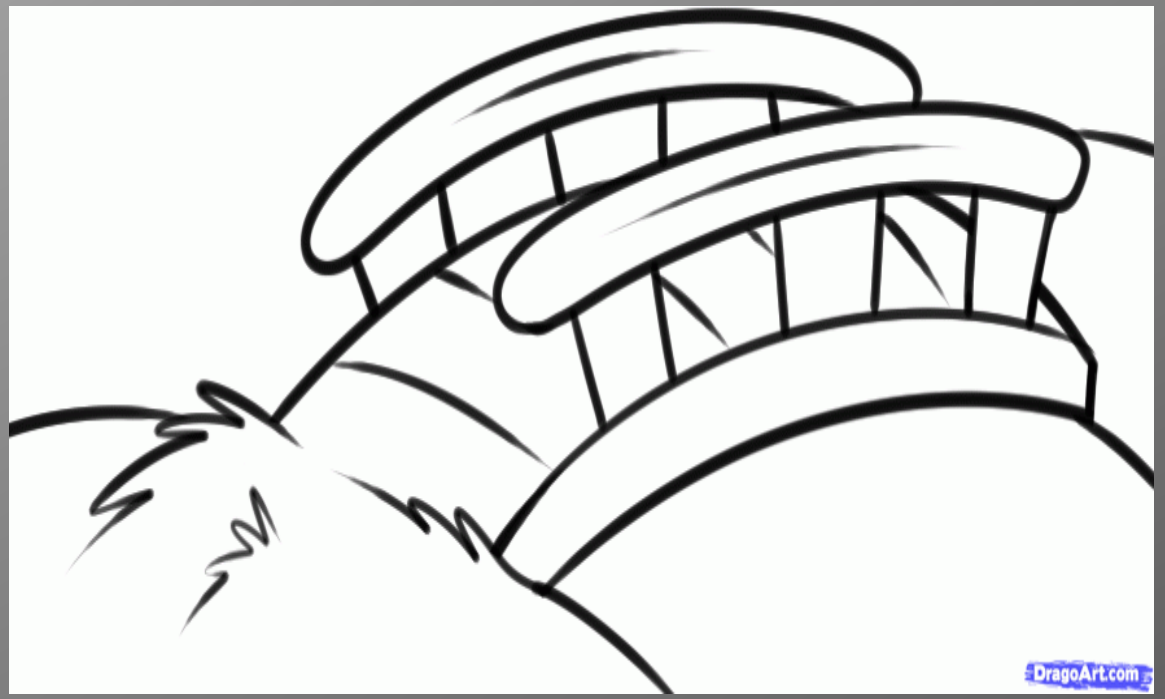
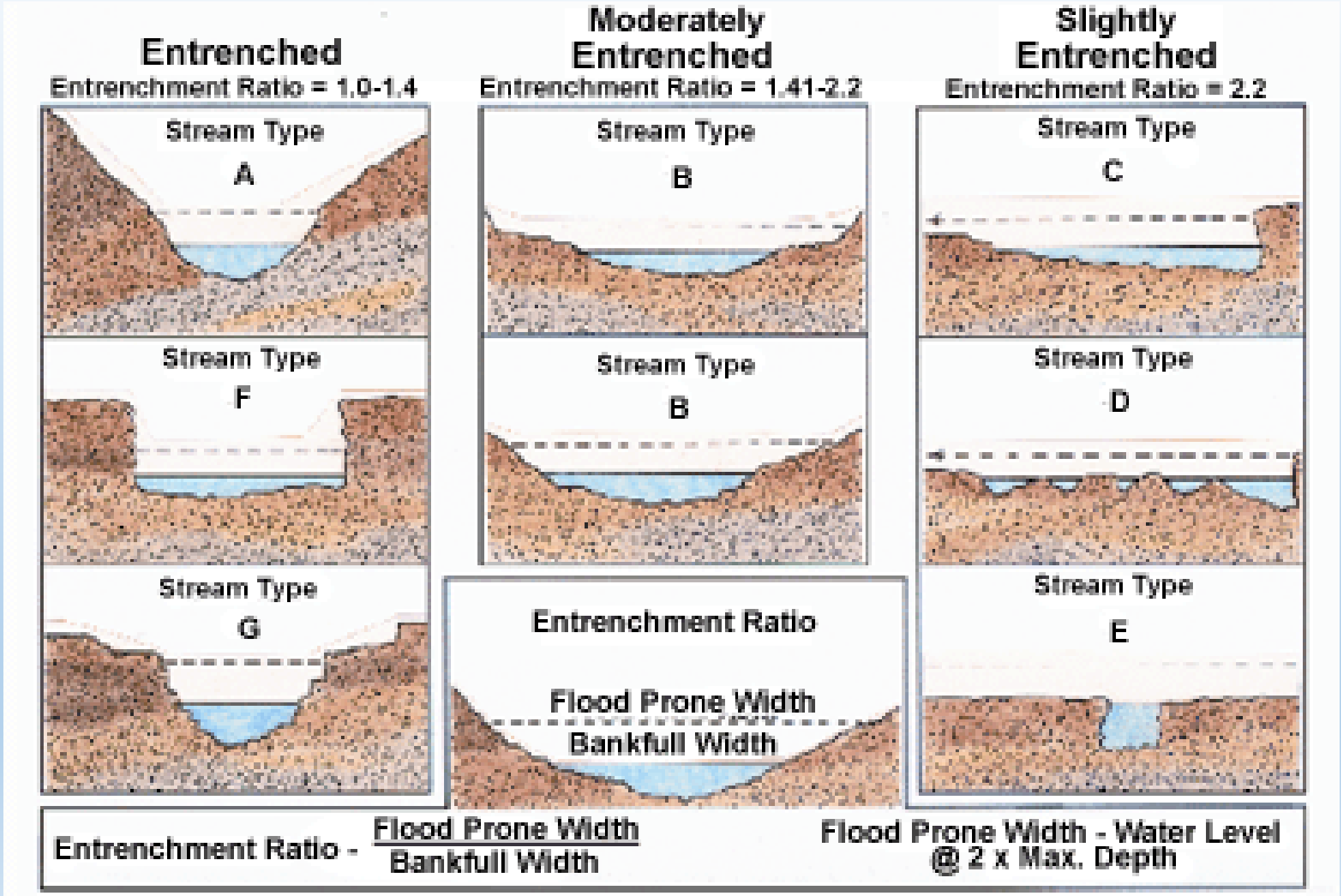

DragoArt.com

Identifying Bankfull

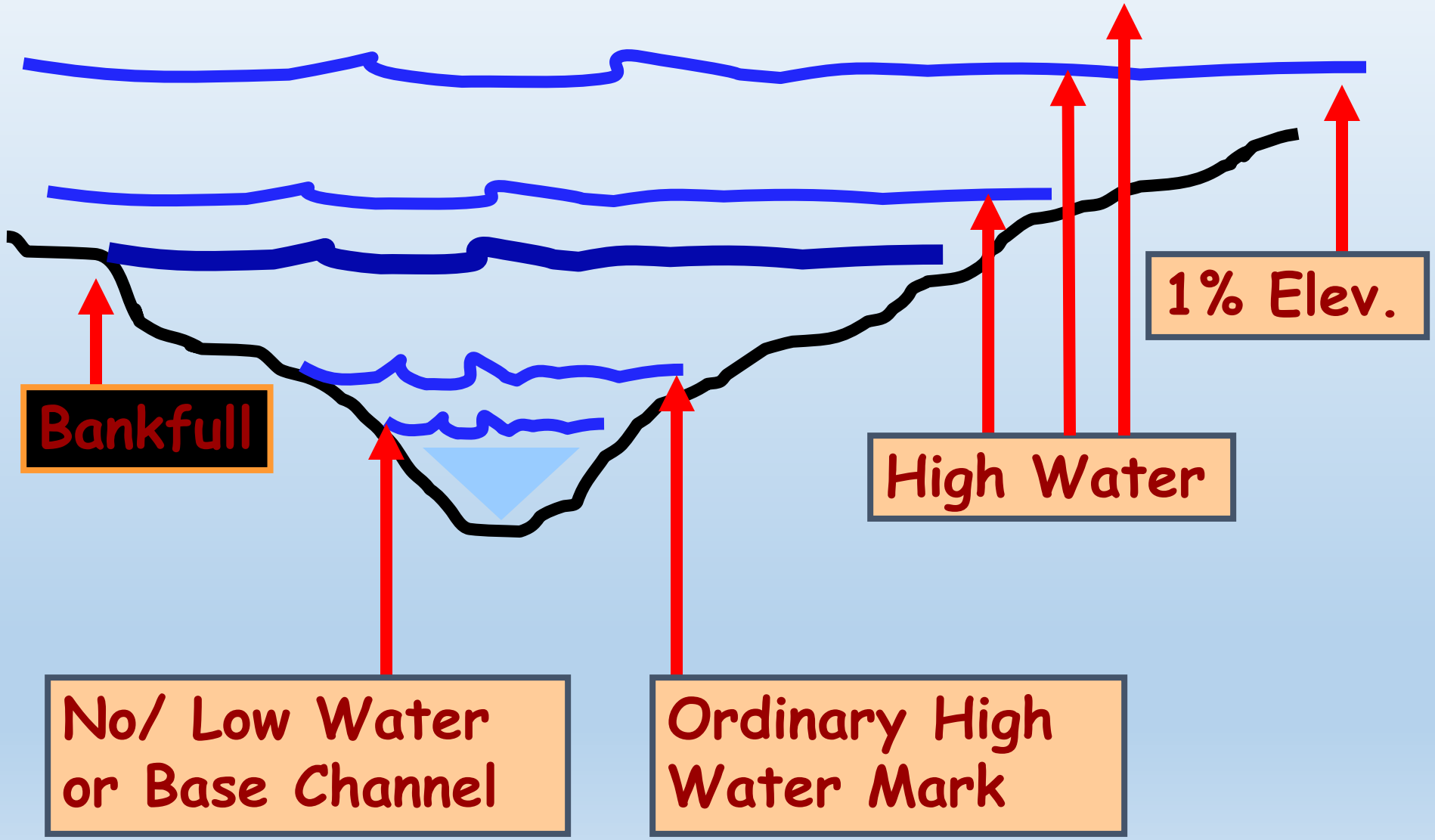
- Bankfull width is the width of the stream that corresponds to the depth of where water fills a main channel to the point of overflowing and into the floodplain.

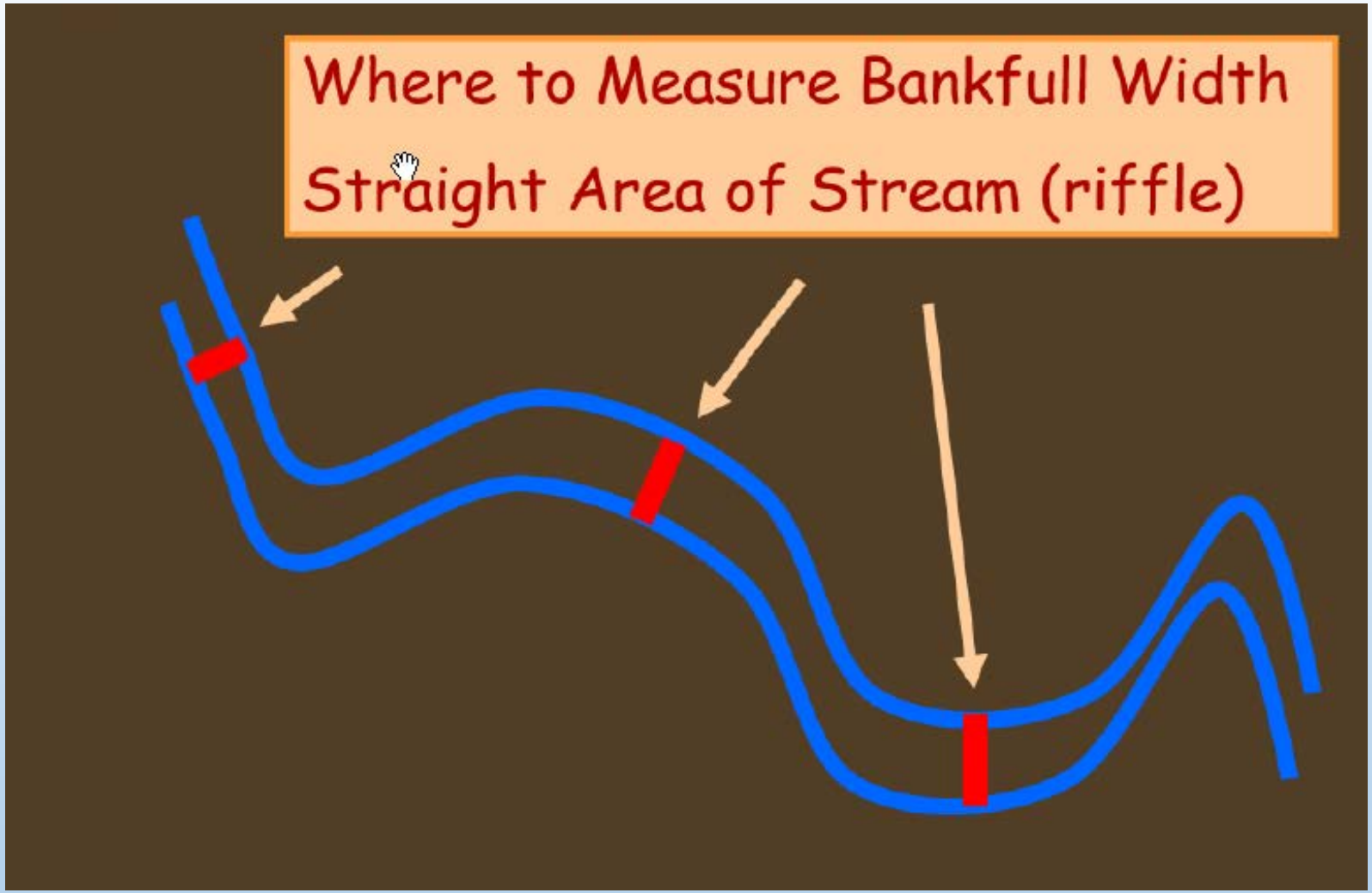
Entrenched Stream types



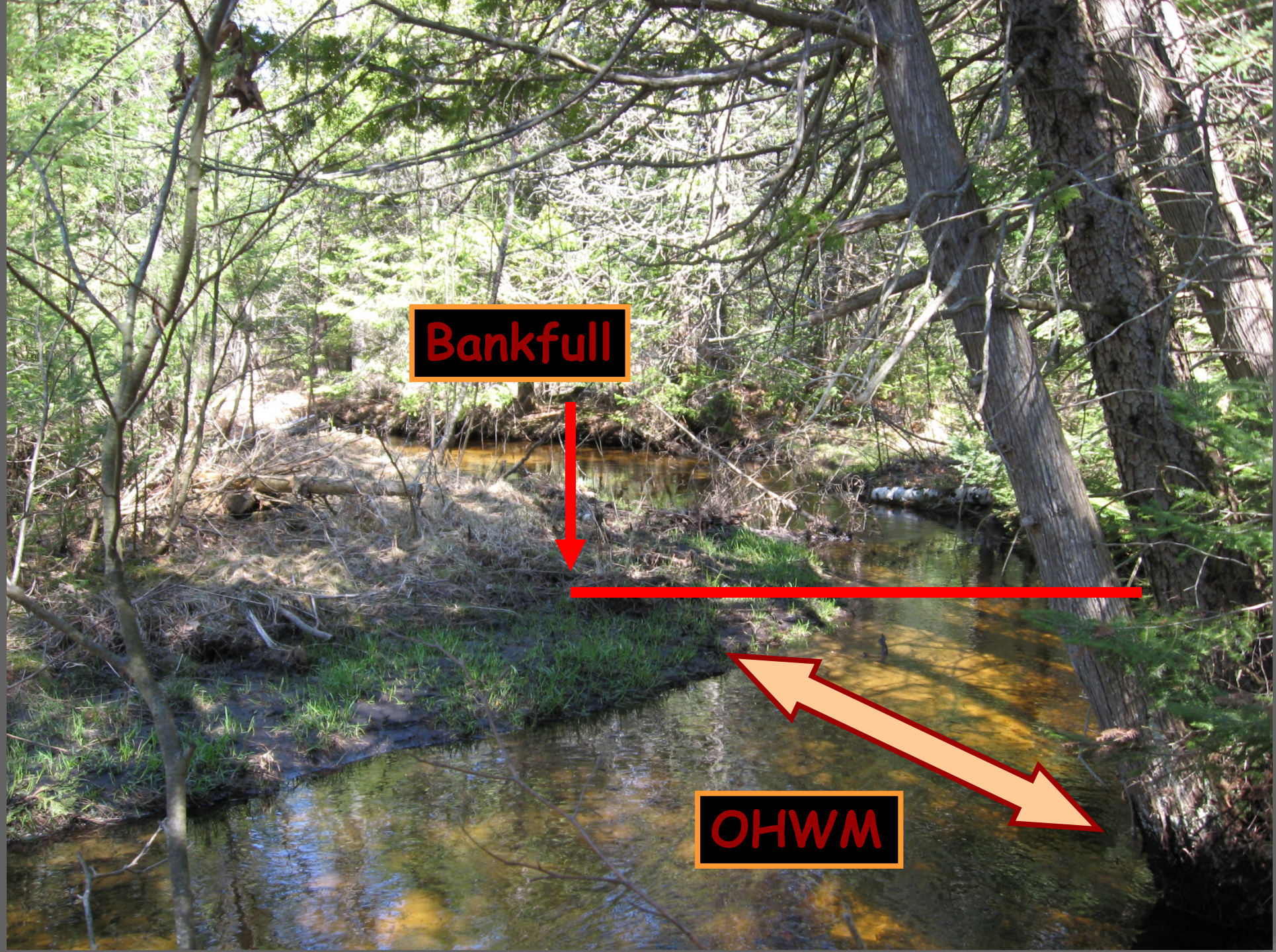
Regional Reference Curves

- Regional reference curves can then be applied which are plots of bankfull depth, width and cross section vs watershed area.
- If curves exist for the channel reach of interest, determine the drainage area to the channel at the point of interest and find bankfull depth and width from the curve.
- Your local DEQ analyst and floodplain engineers are able to assist in this situation if it is applicable.


1% Elev.
Bankfull
High Water
No/ Low Water
or Base Channel
Ordinary High
Water Mark



Measure far enough away from any existing road stream crossing typically 100–200 feet upstream and downstream.


Bankfull
OHWM

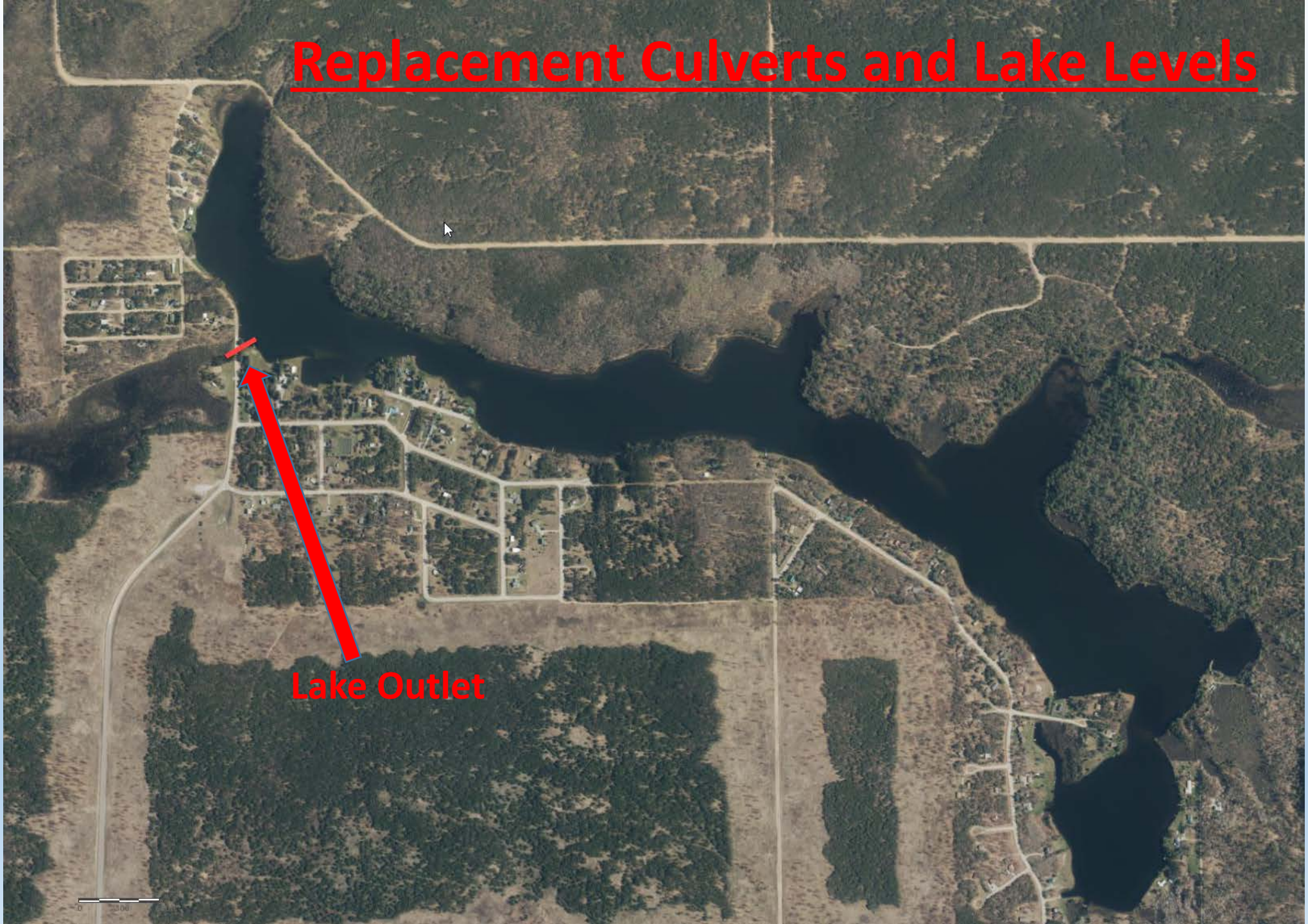

Bankfull elevation often defined by top of point bar

Benefits of Matching Bankfull Widths

- Road less likely to wash out during a flood.
- Allows for invert recess and natural bottom.
- Passes sediments through.
- Lessens likelihood of debris blockage.
- Lessens likelihood of overtopping (weir flow).
- Allows for fish passage during high water.
- Allows for animal movement during low water.
- Allows for navigation if large enough.
- Slower more natural velocities prevents scour.
- Allows for a single culvert, multiple culverts plug up.
- Prevents downstream plunge pool.
- Prevents upstream ponding and road toe saturation.

Other Permitting Considerations ?

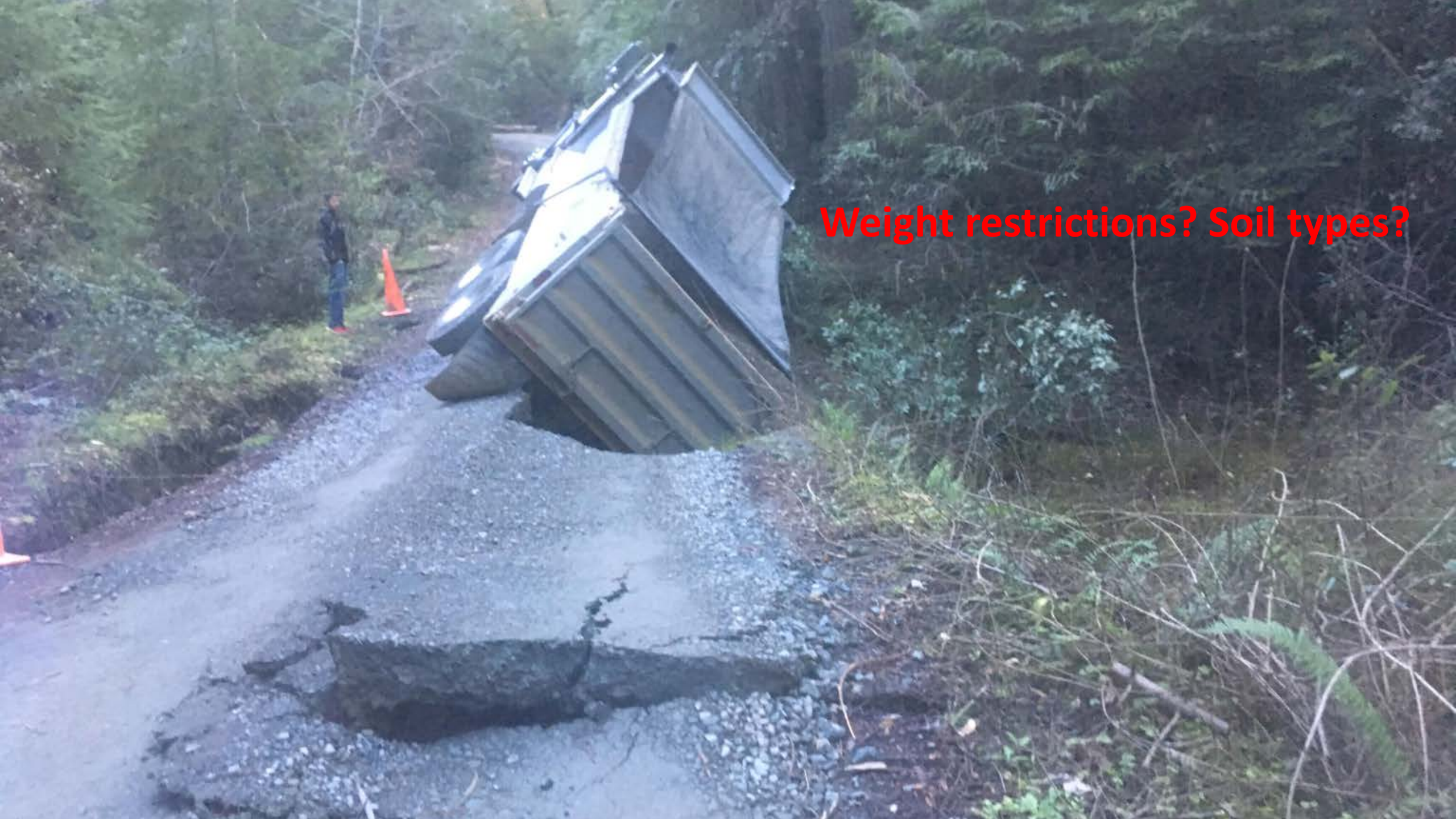
Replacement Culverts and Lake Levels



Wetland Impact Considerations

- Increase in size of culvert(s)
- Lowering invert elevation of culvert (Recessed)
- Potential wetland losses (Draining)


Reducing Wetland Fill
guardrails


Weight restrictions? Soil types?

Navigation?

Safety?

Watercraft Clearance

- 4.3 feet for canoes
- 5.3 feet for run-abouts
- 6.3 feet for pontoons with top down

East Branch of the Chocolay River Marquette County MI 2016 Washout

Design low point of road adjacent to the structure embankment to avoid weir flow failures.

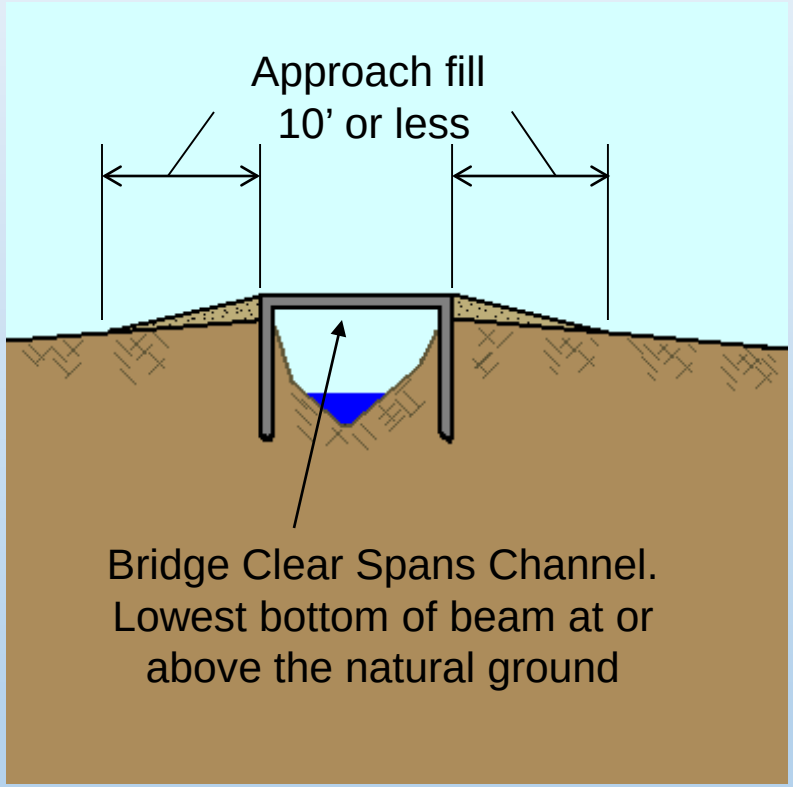
Permitting Considerations what's next?

- Preliminary site inspection
- Existing conditions
- Determined Bankfull
- Assessed Stream type, Wetlands, Soil Type
- Approach and or Cover fill amounts
- Determined Structure type and size

Part 301 General Permit Category

Clear Span Bridges

- Lowest bottom of beam at or above the natural ground elevation on either bank and spans the entire bankfull width.
- Abutments or foundations must be placed a minimum of 1.2 times the bankfull width.
- Allows passage of watercrafts expected to navigate the water.



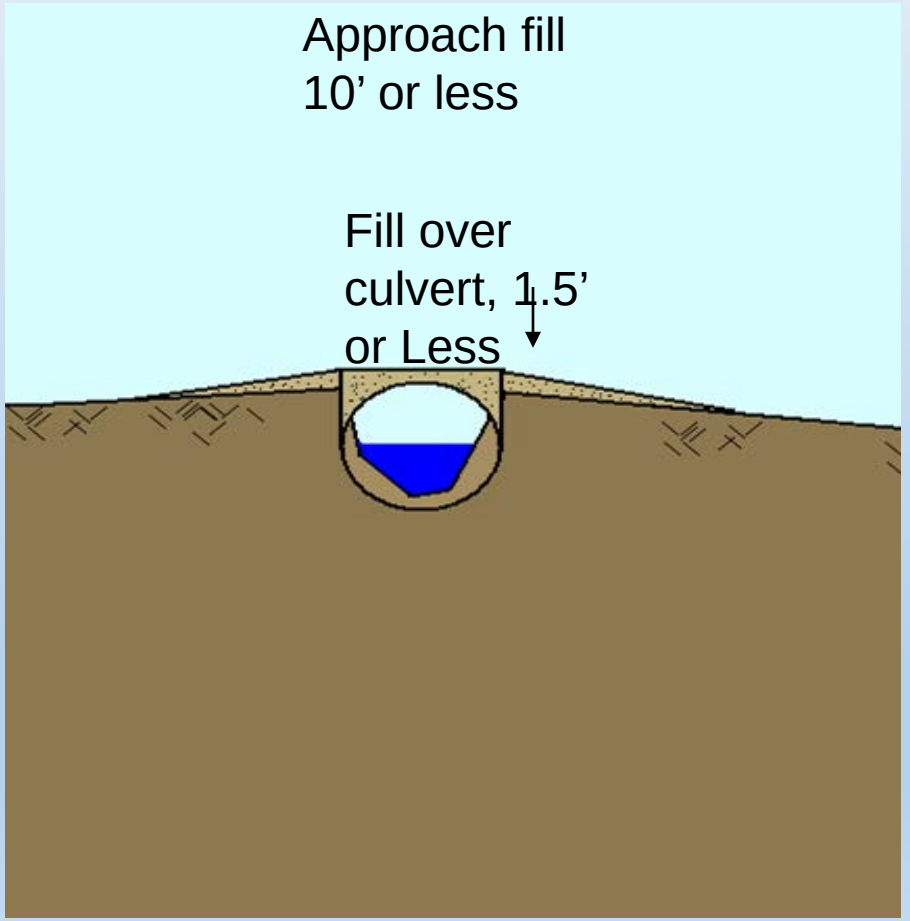
Part 301 Minor Project Category

Culverts

- Culverts must be bottomless (3-sided)

- Or if the structure has a bottom, then the invert elevation must be buried below the stream bottom 1/6 of the bankfull width up to a maximum buried depth of 2 feet.

- A single structure must span a minimum of the bankfull width of the stream.



Joint Permit Application

For Work in Inland Lakes and Streams, Great Lakes, Wetlands, Flood-plains, Dams,
High Risk Erosion Areas and Critical Dune Areas

www.mi.gov/jointpermit

What is the purpose of the Joint Permit Application?	This Joint Permit Application was developed to facilitate the state and federal permit application process administered by the Michigan Department of Environmental Quality (DEQ) and the U.S. Army Corps of Engineers (USACE). The Joint Permit Application is a multi-purpose application used to describe and quantify proposed activities regulated by the DEQ and/or the USACE. This application is for those activities regulated by the following Parts of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended by the State of Michigan. • Part 301, Inland Lakes and Streams • Part 325, Great Lakes Submerged Lands • Part 303, Wetlands Protection • Floodplain Regulatory Authority found in Part 31, Water Resources Protection • Part 315, Dam Safety • Part 323, Shorelands Protection and Management (High Risk Erosion Areas) • Part 353, Sand Dunes Protection and Management (Critical Dune Areas) The regulated activities are summarized in Appendix D. The statutes and rules are available at www.mi.gov/jointpermit. This application is also for those activities regulated by the USACE within the waters of the United States under Section 10, Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404, Clean Water Act of 1977 (33 U.S.C. 1344). Preapplication Meeting: This is an optional service available for activities proposed in inland lakes and streams (Part 301), wetlands (Part 303), and critical dune areas (Part 353). A preapplication meeting can answer many questions regarding whether or not a permit is required and the review process. The application form and fee schedule are available at www.mi.gov/jointpermit.
How do I complete the Joint Permit Application? *An accurate and complete application package is required for processing; inaccurate or missing information will delay processing.*	**There are three parts to a complete Joint Permit Application package:** 1. Application Form 2. Maps and Drawings 3. Fee Follow the checklists on the following page for each part of the application package. **When you have questions or need assistance in completing the application package refer to the following information on our website www.mi.gov/jointpermit or you may contact the appropriate district office, page iii, or through the website link "Who to Contact."** • Joint Permit Application Training Manual • EZ Guides for small projects

4 Project Purpose, Use and Alternatives *Attach additional sheets as necessary.*

Describe the purpose of the project and its intended use; include any new development or expansion of an existing land use.

Describe the alternatives considered to avoid or minimize resource impacts. Include factors such as, but to limited to, alternative locations, project layout and design, and construction technologies. For utility crossings include alternative routes and construction methods.

5 Locating Your Project Site *Attach a legible black and white map with a North arrow.*

Names of roads of closest intersection

Directions from main intersection to the project site, with distances from the best and nearest visible landmark and water body

Description of buildings on the site *(color; 1 or 2 story, other)*

Description of adjacent landmarks or buildings *(address; color; etc)*

How can your site be identified if there is no visible address?

6 Easements and Other Permits

☐ No ☐ Yes Is there a conservation easement or other easement, deed restriction, lease, or other encumbrance upon the property?

➡ If yes, attach a copy. Provide copies of court orders and legal lake levels if applicable.

List all other federal, interstate, state, or local agency authorizations including required assurances for Critical Dune Area projects.

Agency	Type of Approval	Number	Date Applied	Date approved /denied	Reason for denial

7 Compliance

If a permit is issued, when will the activity begin? (M/D/Y)

Proposed completion date (M/D/Y)

☐ No ☐ Yes Has any construction activity commenced or been completed in a regulated area?

➡ If Yes, identify the portion(s) underway or completed on drawings or attach project specifications and give completion date(s).

☐ No ☐ Yes Were the regulated activities conducted under a DEQ and/or USACE permit?

➡ If Yes, list the permit numbers

☐ No ☐ Yes Are you aware of any unresolved violations of environmental law or litigation involving the property?

➡ If Yes, attach explanation.

8 Adjoining Property Owners *Provide current mailing addresses. Attach additional sheets/labels for long lists.*

☐ Established Lake Board ☐ Lake Association	Contact Person	Mailing Address	City	State and Zip Code

List all adjoining property owners.

If you own the adjoining lot, provide the requested information for the first adjoining parcel that is not owned by you.

Property Owner's Name	Mailing Address	City	State and Zip Code

Costs and Alternatives

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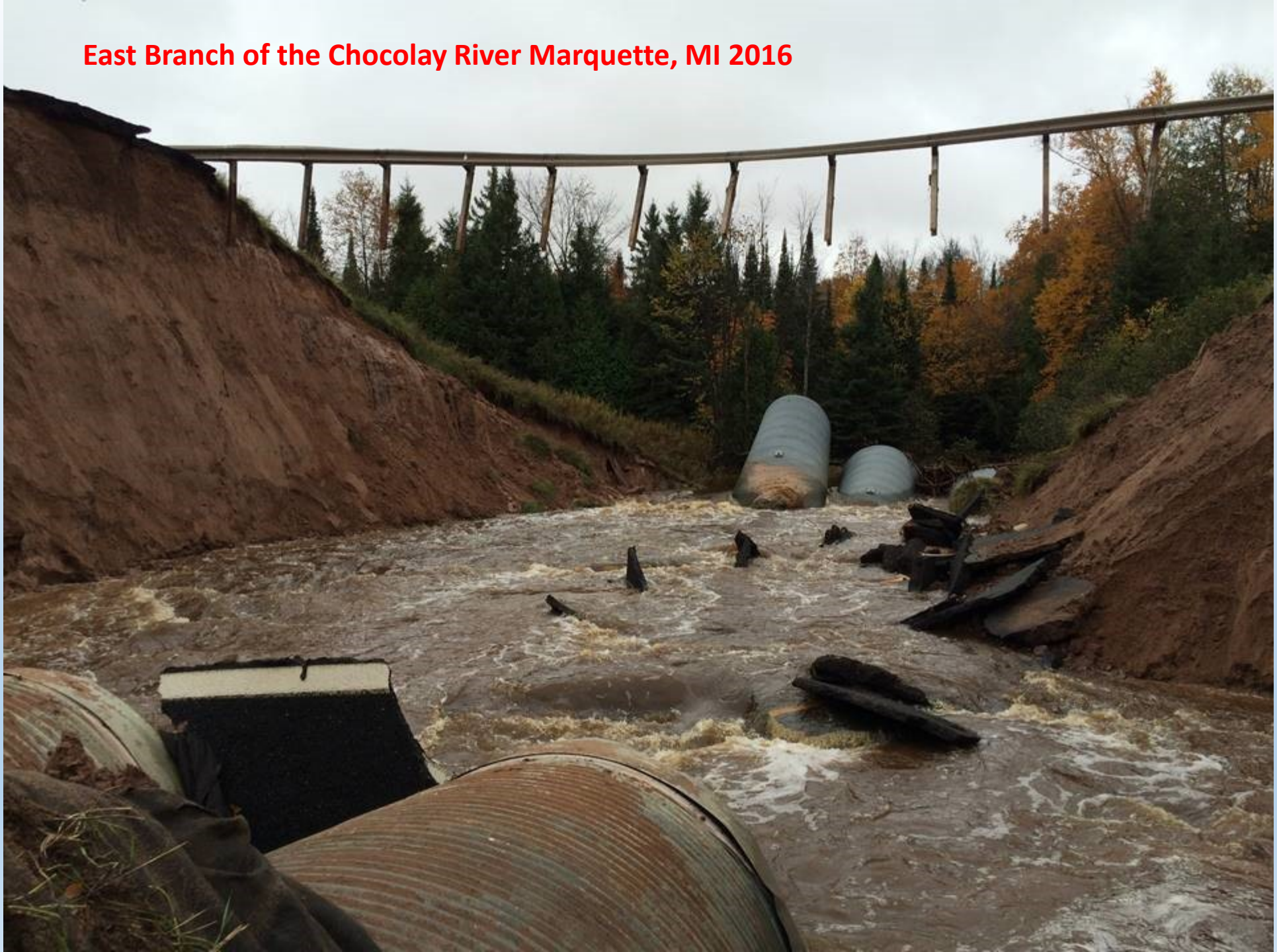
Swedetown Creek
Houghton, MI 2018


Houghton, MI 2018


Houghton, MI 2018

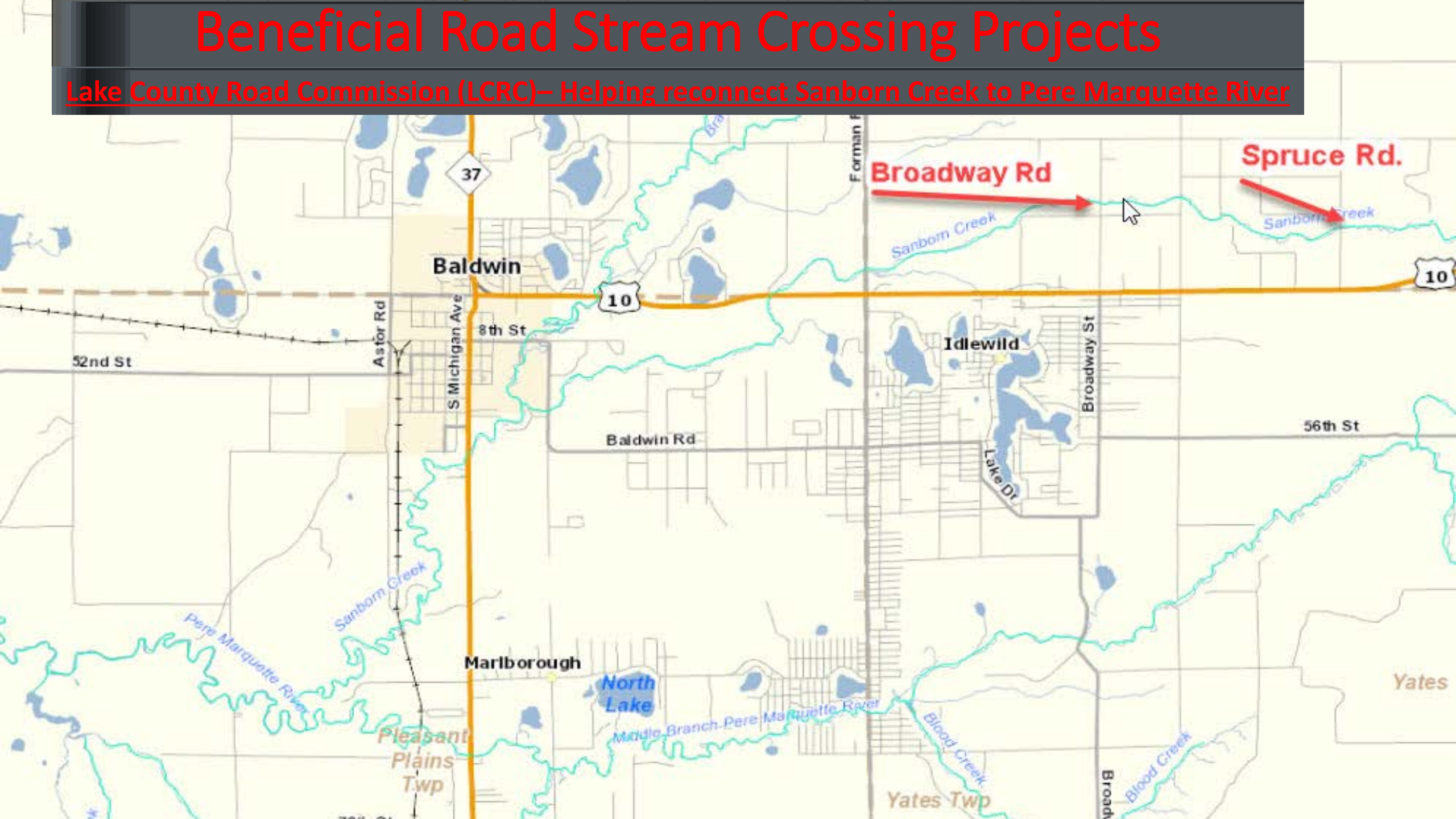
East Branch of the Chocolay River Marquette, MI 2016




East Branch of the Chocolay River Marquette, MI 2016

Beneficial Road Stream Crossing Projects

Lake County Road Commission (LCRC)– Helping reconnect Sanborn Creek to Pere Marquette River



Broadway Street Downstream Before Replacement

Broadway Street Downstream Before Replacement

Broadway Street Downstream After Replacement

Broadway Street Downstream After Replacement

Spruce Street Downstream Before Replacement

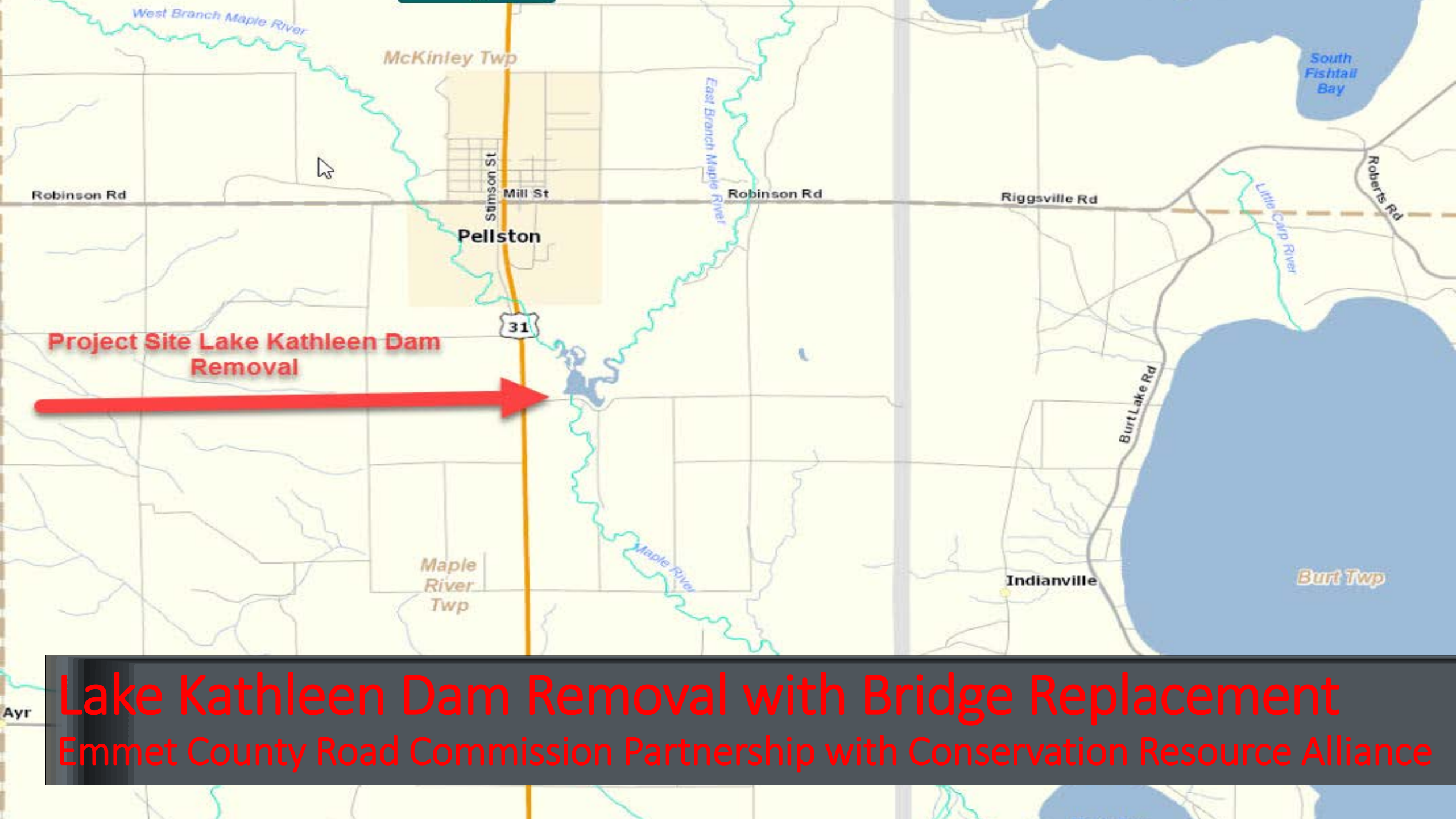
Spruce Street Upstream Before Replacement

Spruce Street Upstream During Replacement

Spruce Street Downstream After Replacement

Benefits to Consider at Replacement Locations

- Allows for fish passage.
- Allows for animal movement during low water.
- Allows for navigation.
- Slower more natural velocities prevents scour.
- Road less likely to wash out during a flood.
- Bottomless Arch Pipe allows for natural stream bottom and passing sediments through freely.



Lake Kathleen Dam Removal with Bridge Replacement

Emmet County Road Commission Partnership with Conservation Resource Alliance

Thank You