Pulling together the road and stream perspective

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Road-Smart Stream Crossings

- The object of this process is to get better installations, good decision making, and designing easier to maintain culverts.

- This is a win-win situation. By designing for the right culvert installation, you prolong the life of the culvert, save money over time, create a safer road, and improve fish and aquatic organism passage.

Study finds Midwest flooding more frequent

Research covered more than 50 years of data in 14 states

This aerial view of a flooded Midwestern farm has been all too common during four severe floods that have affected the region since 2008. Photo courtesy of Aneta Goska.

Lessons Learned from Irene:

Vermont RPCs Address Transportation System Recovery

NADO RESEARCH FOUNDATION
Center for Transportation Advancement and Regional Development
with support from the Federal Highway Administration

Restoring Aquatic Connectivity and Increasing Flood Resilience - Hurricane Sandy Mitigation

Collaboratively Increasing Resiliency and Improving Standards for Culverts and Road Stream Crossings

This project is developing a partner-driven, science-based approach for identifying and prioritizing culvert road stream crossings in the area impacted by Hurricane Sandy for increasing resilience to future floods while improving aquatic connectivity for fish passage. The resulting information and tools will be used to inform and improve decision making by towns, states and other key decision makers.

Abstract:

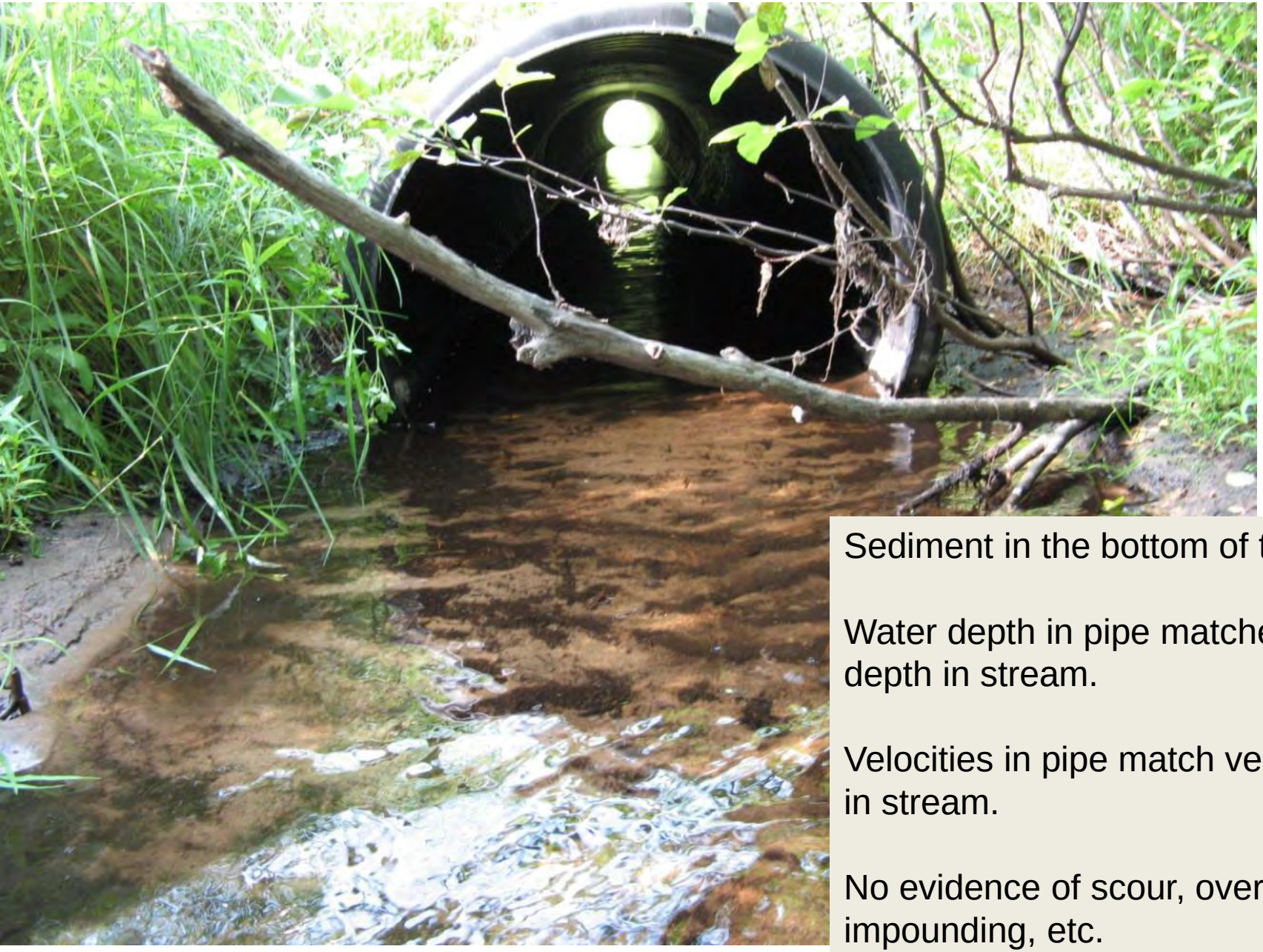
Road-smart stream crossings: benefits of early coordination

Early coordination

DNR can assist with

- Culvert/ stream evaluation
- Stream & watershed information
- Coordination with key stakeholders
  - Cost share assistance
- Permits
- Recommendations for road-smart crossings to save money over the long term
  - Flood resilient
  - Low maintenance
  - Long culvert life

What a low cost, flood resilient, low maintenance road looks like



Sediment in the bottom of the pipe.

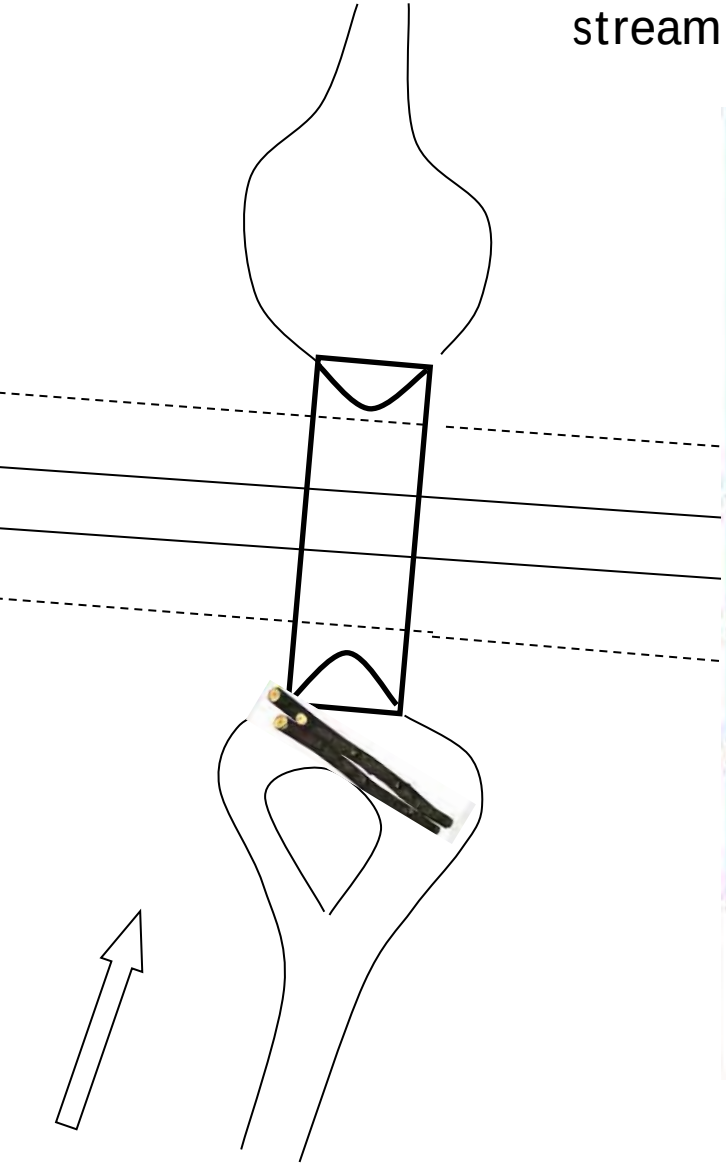
Water depth in pipe matches water depth in stream.

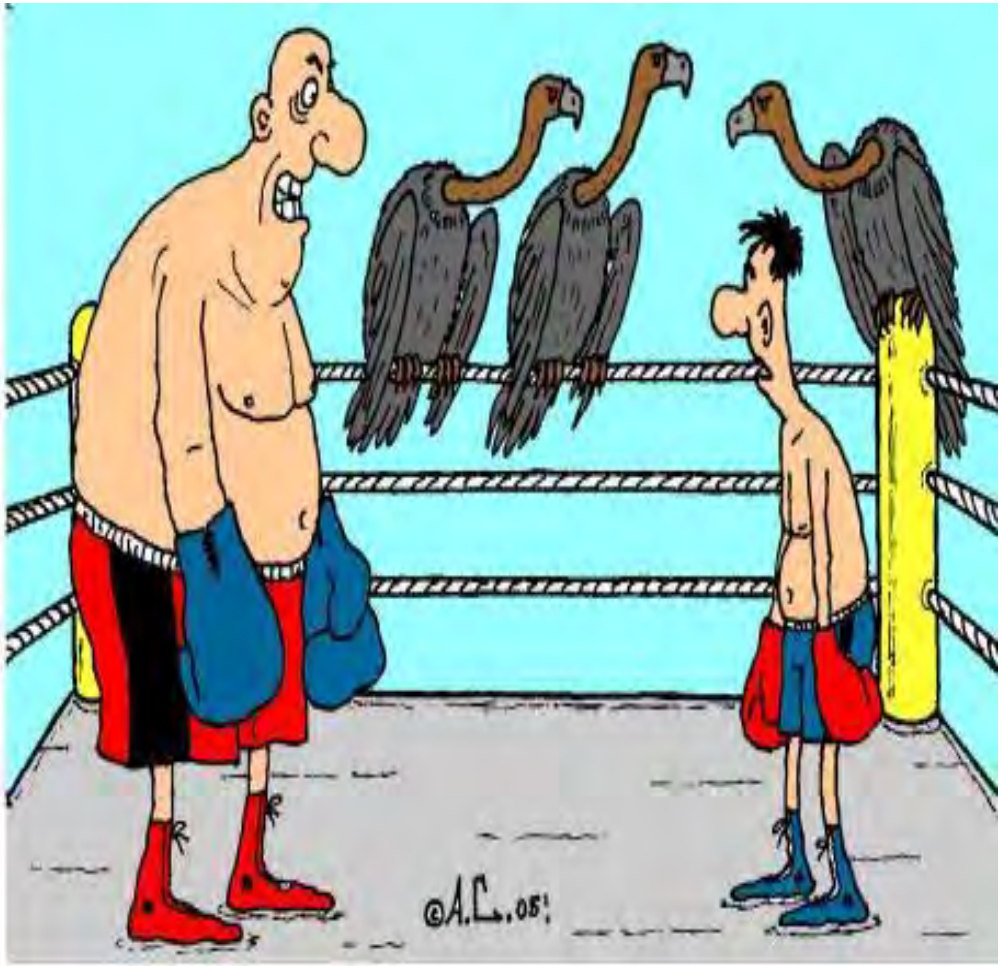
Velocities in pipe match velocities in stream.

No evidence of scour, overtopping, impounding, etc.

Signs of stream connectivity problems = signs of road problems!

Hourglass shape and debris are signs that the road and stream are fighting each other.





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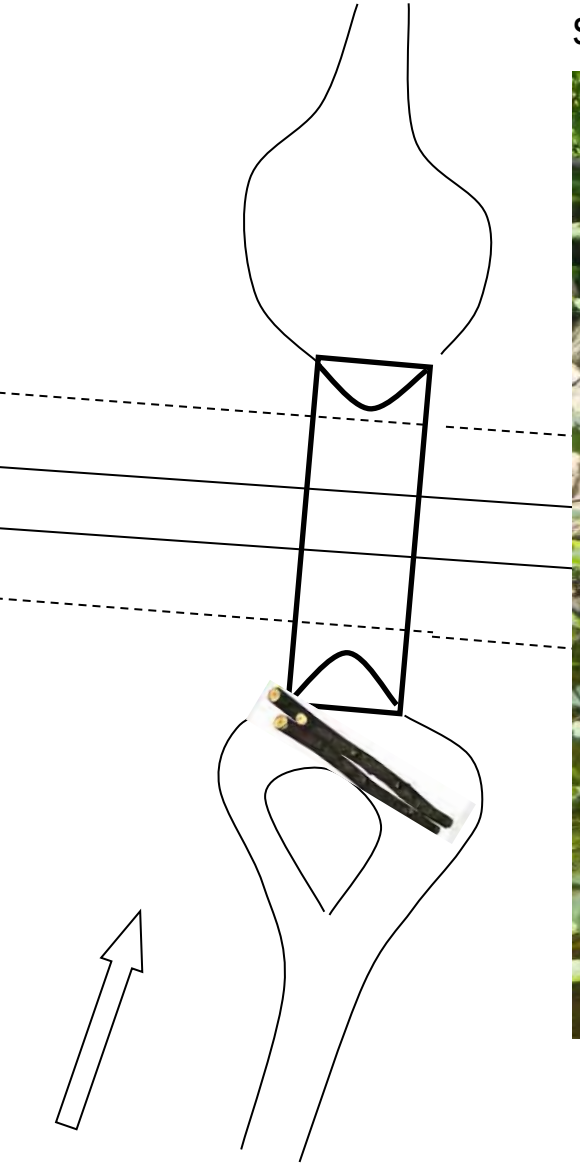
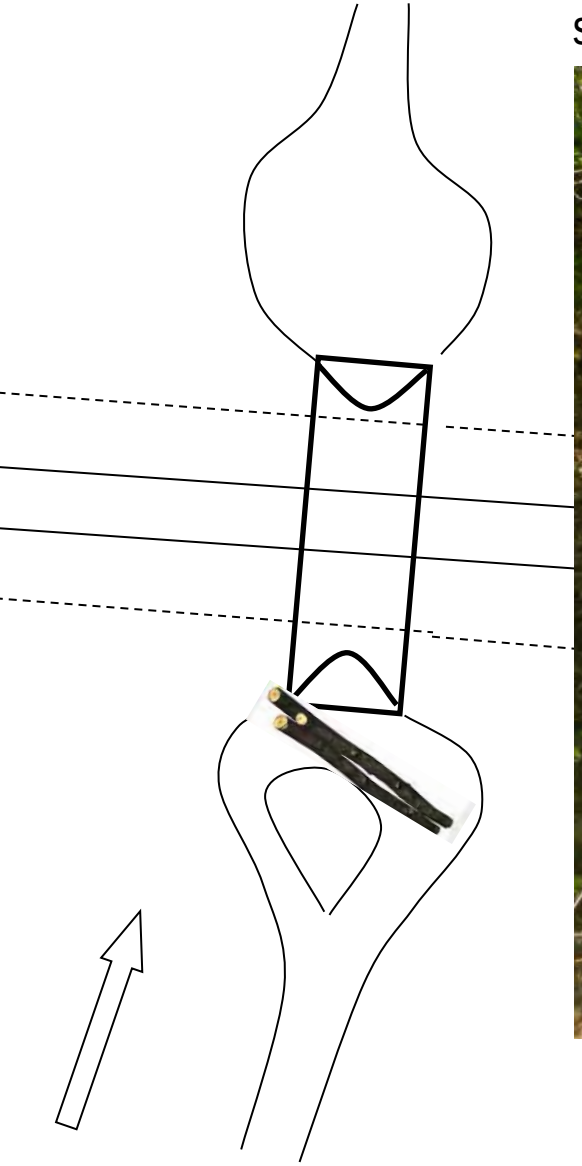


Hourglass shape and debris are signs that the road and stream are fighting each other.

Perched culvert outlets with greatly increased water speeds block fish.

A larger culvert(s) set lower would eliminate the fish passage barrier

Signs of stream connectivity problems = signs of road problems!



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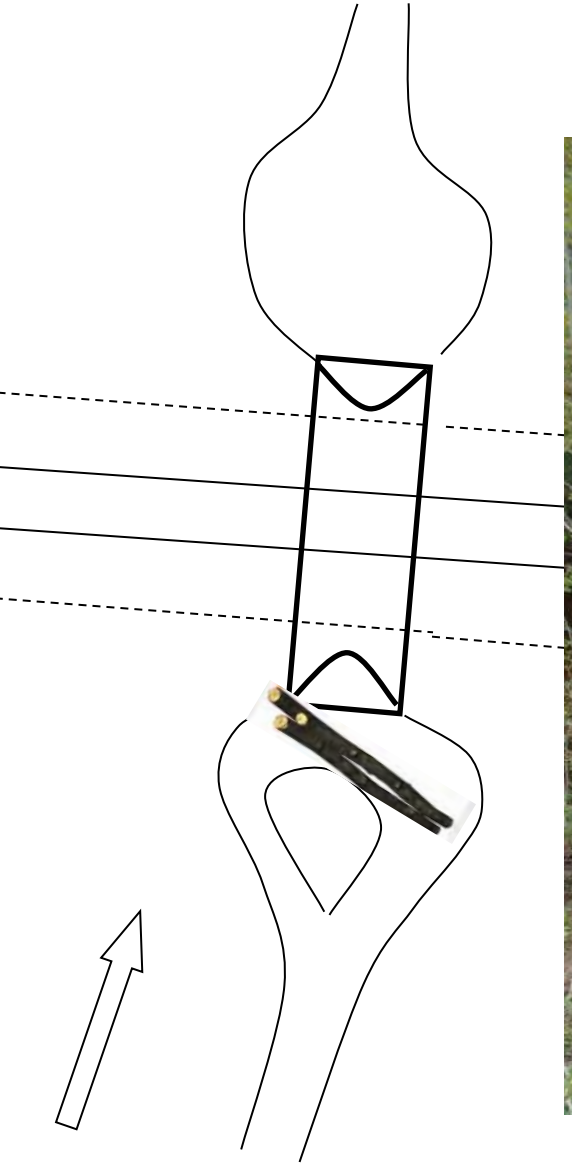

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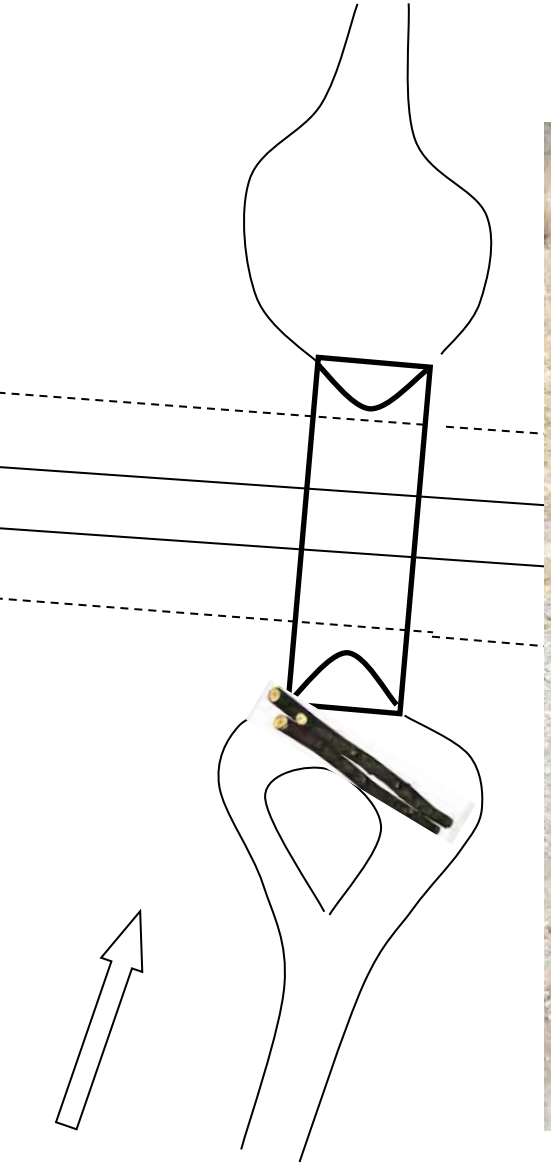

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Gravel deposits downstream from frequent road failures reduce the flow capacity of the stream and road culverts resulting in more frequent road closures
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Road-smart stream crossings: benefits of good erosion control

STREAM PERSPECTIVE
Coffer Dams & Bypass Flows

Protect water quality

ROAD PERSPECTIVE
Non Erodible Coffer Dams & Stream Bypass

- Verify elevations
- Easily remove unsuitable material
- Suitable culvert bedding
- Better compaction
- Most CTH Depts. have re-usable coffer dams and pumps for stream culvert replacements

Removing corduroy, boulders, and unsuitable soils is a common situation at culvert replacements. A dry pipe trench makes this a lot easier.

Problems with earthen coffer dams and no stream bypass

FIXING ROAD PROBLEMS ALSO FIXES STREAM PROBLEMS!

SIZE CORRECTLY, SET LOW ENOUGH, IMPLEMENT GOOD EROSION CONTROL

FIX IT ONCE, MOVE ON, BE DONE WITH IT!