Forest Infrastructure: Road/Stream Crossings

Forests for Fish: Lower Michigan Society of American Foresters
Fall Meeting – October 5, 2017 – Ramada Inn, Grayling, MI

Josh Leisen
Watershed Project Manager

Huron Pines

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Overview

- Introduction

- Aquatic habitat connectivity – why it's important
  - Context of road/stream crossings in Northeast Michigan
  - Consequences of poor crossings

- Project prioritization
  - Comprehensive inventories
  - Stakeholder input

- Project implementation
  - Best Management Practices
  - Funding and partnerships
  - Evaluation

- Questions/Discussion

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501(c)(3) Nonprofit Organization

Founded in 1973

Mission:
To protect the Great Lakes by conserving the forests, lakes and streams of Northeast Michigan

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Strategic Vision: huronpines.files.wordpress.com/2015/09/2015-12-11-hp-strategic-vision.pdf

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Major Programs:

- Water

- Wildlife

- Community

Song of the Morning Dam Removal Project
Pigeon River Ribbon Cutting Celebration – Aug. 31, 2016

Huron Pines Goals:

- Coordinate large-scale, high-impact and long-term habitat restoration and enhancement projects that protect healthy forests and clean water

- Provide leadership to develop private-public sector partnerships in a collaborative approach to solving problems

- Integrate a conservation effort into all aspects of our communities

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Aquatic Habitat Connectivity – Why it's Important…

- *Landscape Connectivity*: The degree to which a landscape facilitates or impedes movement among resource patches

- Fish passage
  - Spawning
  - Forage
  - Refuge
  - Other aquatic species

Fantail Darter – *Etheostoma flabellare*
Au Gres River – Whittemore, MI

- Healthy fisheries in Northeast Michigan are crucial to the region's outdoor recreation and tourism-based economy

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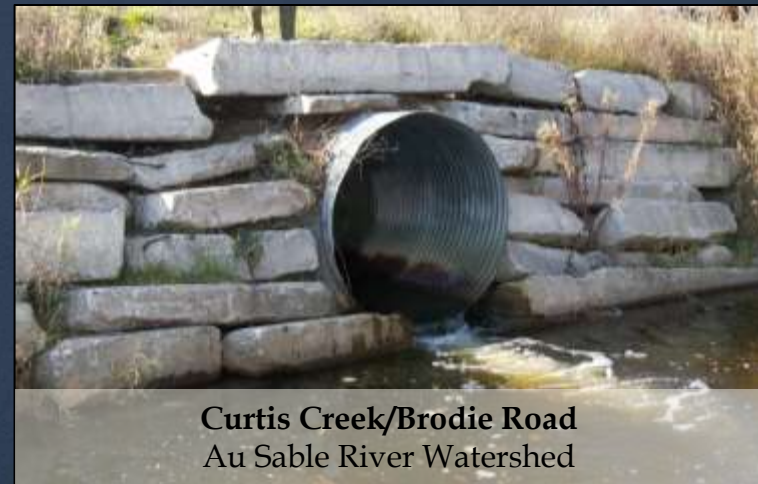October 5, 2017 – Ramada Inn – Grayling, MI
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Poorly designed crossing structures…

- Thousands of undersized crossings in Northeast Michigan
- Most are decades old, small and short for reduced cost
- Undersized, misaligned culverts (corrugated metal pipes)
- AOP Barriers – perched culverts and velocity barriers
- Pollutant loading due to runoff and erosion issues

Curtis Creek/Brodie Road
Au Sable River Watershed

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Poorly designed crossing structures…

- Disrupt transport of sediment, wood, nutrients
- Road maintenance and safety issues
- Alter hydrology and geomorphology
- Thermal pollution
- Failure to pass flood water - complete washouts possible

Crow Creek/Townline Road (Replaced in 2013)
Ogemaw County - Rifle River Watershed

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Houghton Creek/Beechwood Road Washout (2012)
Rose City, MI – Rifle River Watershed

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What's the problem with too much sand?

- Gravel substrate is very important
  - Spawning success for salmonids and other species
  - Habitat for some fish and many macroinvertebrates
- Turbidity and excess nutrient loads impair water quality
- Positive feedback loop leading to wider, shallower streams

Spawning Brook Trout
Mullet Creek – Cheboygan County, MI

Excessive sediment in the stream channel (and lack of riparian buffer)
Au Gres River – Arenac County, MI

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How do we address these issues?

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Identify Meaningful Goals and Objectives

Potential project sites in area of interest

Comprehensive inventory

Database of sites

Objective ranking based on data

Severe sites

Analysis of ecological & spatial context

Megalist

Engage partners and stakeholders

Shared priorities

Fundraising and project planning

Archive Completed Projects

PROJECT

Implementation
Evaluation

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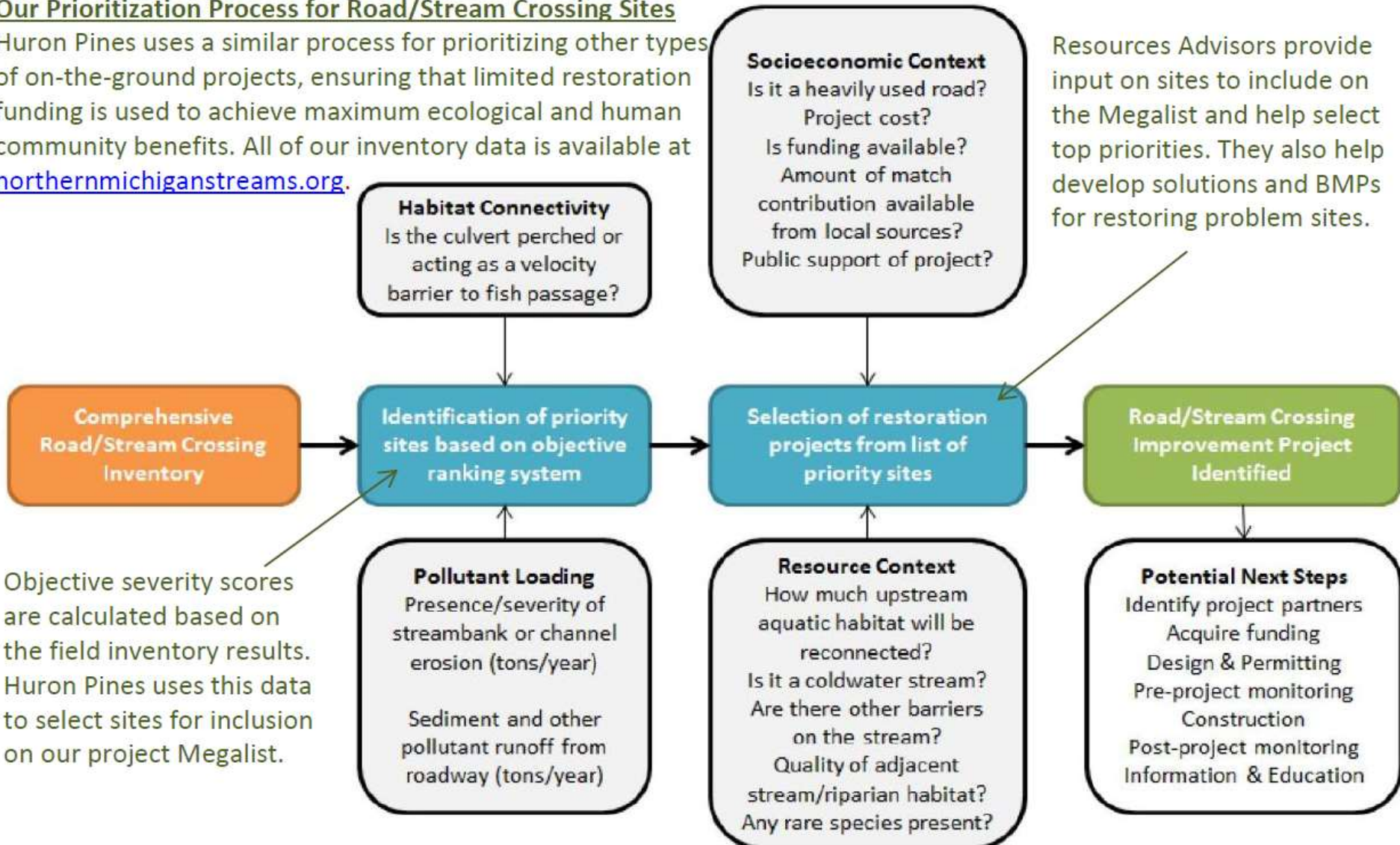October 5, 2017 – Ramada Inn – Grayling, MI
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Our Prioritization Process for Road/Stream Crossing Sites

Huron Pines uses a similar process for prioritizing other types of on-the-ground projects, ensuring that limited restoration funding is used to achieve maximum ecological and human community benefits. All of our inventory data is available at northernmichiganstreams.org.

Resources Advisors provide input on sites to include on the Megalist and help select top priorities. They also help develop solutions and BMPs for restoring problem sites.
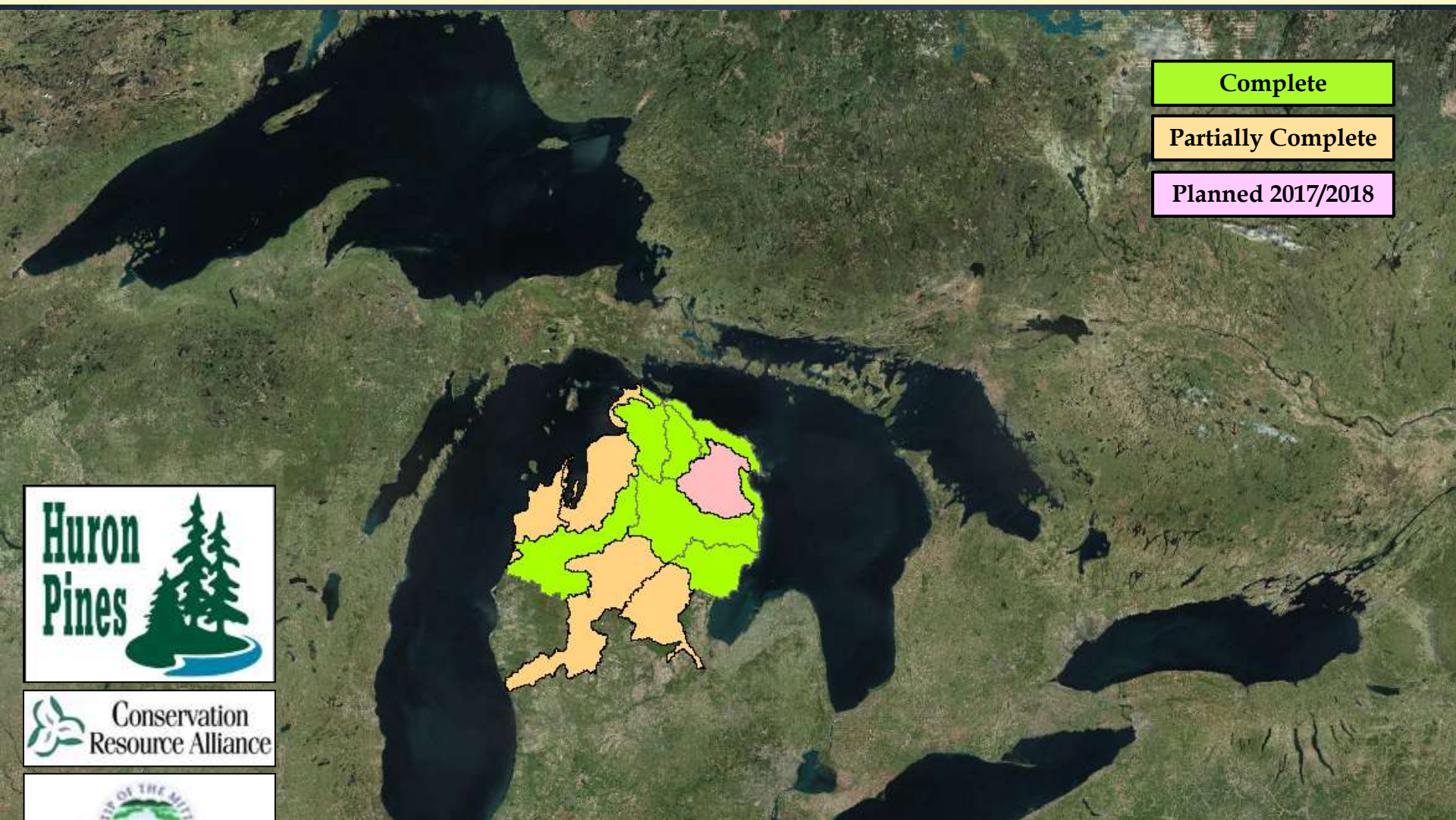
Socioeconomic Context
Is it a heavily used road?
Project cost?
Is funding available?
Amount of match contribution available from local sources?
Public support of project?

Habitat Connectivity
Is the culvert perched or acting as a velocity barrier to fish passage?

Objective severity scores are calculated based on the field inventory results. Huron Pines uses this data to select sites for inclusion on our project Megalist.

Comprehensive Road/Stream Crossing Inventory → **Identification of priority sites based on objective ranking system** → **Selection of restoration projects from list of priority sites** → **Road/Stream Crossing Improvement Project Identified**

Pollutant Loading
Presence/severity of streambank or channel erosion (tons/year)

Sediment and other pollutant runoff from roadway (tons/year)

Resource Context
How much upstream aquatic habitat will be reconnected?
Is it a coldwater stream?
Are there other barriers on the stream?
Quality of adjacent stream/riparian habitat?
Any rare species present?

Potential Next Steps
Identify project partners
Acquire funding
Design & Permitting
Pre-project monitoring
Construction
Post-project monitoring
Information & Education

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Complete

Partially Complete

Planned 2017/2018

Road/Stream Crossing Inventories
Data and photos publicly available at www.northernmichiganstreams.org

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How do we address problems caused by poor RSX sites?

- Restore functional connectivity for organism passage

- Reduce inputs of sediment and associated pollutants

- Minimize road maintenance and risk of future washout

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Best Management Practices…

- Structures adequately sized and aligned with stream
- Countersunk to avoid perching and for natural substrate
- Embankments no steeper than 1V:3H slope and vegetated
- Harden road surface if road approaches are steep
- Direct runoff through filter strips or rock rip rap in ditches
- Avoid working in high flow or during sensitive periods
- Manage sediment during and after construction activities
- Follow equipment decontamination protocols to prevent spreading invasive species
- Additional T/E species considerations where applicable

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Best Management Practices…temporary logging crossings

- Minimize sediment inputs to surface waters
- Follow decontamination protocols
- Common sense courtesy
  - Don't leave a mess…

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Project funding and partnerships

- Huron Pines > 75 road/stream crossing improvements

- Project team:
  - Project manager, engineer, county road commissions, construction contractors, natural resource agencies, landowners, other conservation groups and funders

- Funding sources include federal and state agencies, community foundations, conservation nonprofits, and county road commissions

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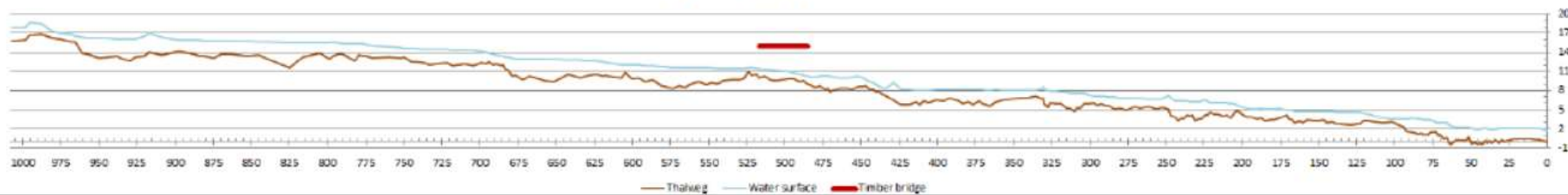"Forest Infrastructure: Road/Stream Crossings"
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MAJOR FUNDING SOURCES

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Evaluation

OG23 Houghton Creek/Flynn Road
Post-project Longitudinal Profile (6/2/2016)

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Questions?