

Stream Habitat Management

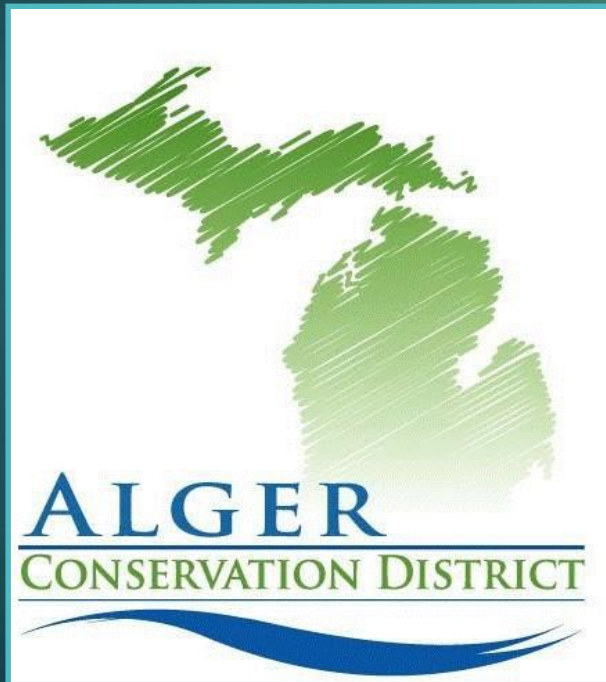


MISA CADY, DISTRICT CONSERVATIONIST, USDA-NRCS

AMY BASTONE, AREA ENGINEER, USDA-NRCS

Who are we

We work with local conservation districts to inform people about the importance of conserving and managing natural resources.



Conservation Assistance



- ▶ Soil
- ▶ Water
- ▶ Air
- ▶ Plants
- ▶ Animals

Local River Systems



Zones

1. Headwaters
2. Transfer
3. Depositional



Floodplain and Riparian

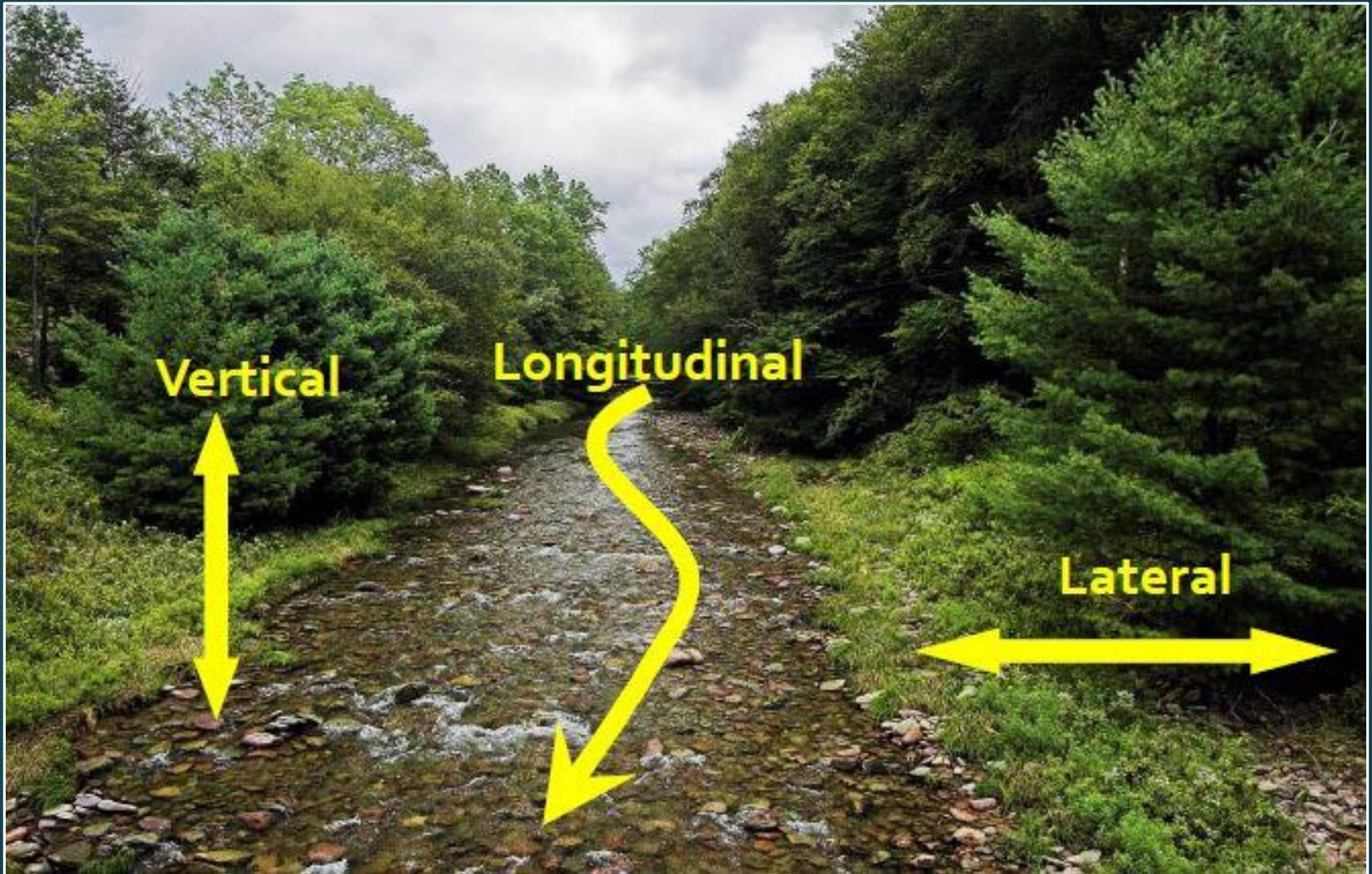
Rivers connected to their floodplains interact with riparian vegetation, which influences channel processes.



Stream Habitat



River Systems & Ecology



Zones

1. Brook Trout
2. Sculpin
3. Darters



Inventory and Evaluate

United States
Department of
Agriculture

Forest Service

National
Technology and
Development
Program

7700—Transportation Mgmt
November 2005



NATIONAL INVENTORY AND ASSESSMENT PROCEDURE—For Identifying Barriers to Aquatic Organism Passage at Road-Stream Crossings

Online tutorial now available at:
http://www.fs.fed.us/pnw/pep/PEP_inventory.html



United States
Department of
Agriculture

Natural
Resource
Conservation
Service

National Biology Handbook
Subpart B—Conservation Planning

Part 614

Stream Visual Assessment Protocol Version 2



Inventory and Evaluate

**Going
with**



**the
Flow**

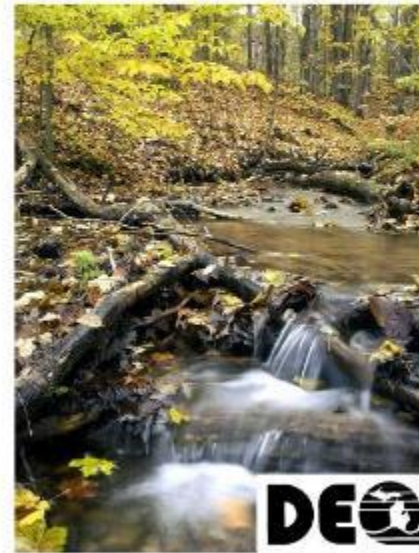
**Understanding Effects of Land Management
on Rivers, Floods, and Floodplains**

Barbara Ellis-Sugai and Derek C. Godwin



Great Lakes, Great Times, Great Outdoors
www.michigan.gov/dnr

**SUSTAINABLE SOIL AND
WATER QUALITY PRACTICES ON
FOREST LAND**



MICHIGAN DEPARTMENT OF NATURAL RESOURCES
AND
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

6247-1 Rev. 10/11/2009

Resource Concerns



Identify Problems

- ▶ Soil
- ▶ Water
- ▶ Plants
- ▶ Animals



Identify Options for Improvement

- ▶ Reduce Erosion
- ▶ Conserve Soil
- ▶ Improve Water Quality
- ▶ Revegetate
- ▶ Enhance Stream Habitat



Conservation Practice Standards

- ▶ Stream Habitat Improvement and Management
- ▶ Streambank and Shoreline Protection
- ▶ Aquatic Organism Passage
- ▶ Stream Crossing
- ▶ Riparian Forest Buffer
- ▶ Tree & Shrub Establishment
- ▶ Forest Trails and Landings

TECHNICAL GUIDE
SECTION IV
State-Wide
Stream Habitat Improvement and Management 395-1

Stream Habitat Improvement and Management (Acre) 395

DEFINITION

Maintain, improve, or restore the physical, chemical, and biological functions of a stream and its associated riparian zone, necessary for meeting the life history requirements of aquatic species.

PURPOSES

1. Provide suitable habitat for desired aquatic species.
2. Provide stream channel and associated riparian conditions that maintain ecological processes and connections of diverse stream habitat types important to aquatic species.

CONDITIONS WHERE PRACTICE APPLIES

All streams and their adjoining backwaters, floodplains, associated wetlands, and riparian areas where geomorphic conditions or habitat deficiencies limit reproduction, growth, survival, and diversity of aquatic species.

CRITERIA

Planned fish stream improvements will be based on a stream assessment that identifies habitat limitations. This assessment may be conducted using the Stream Visual Assessment Protocol, Water Quality Indicators Guide or other assessment procedure. When assessing large projects, coordination with the Michigan Stream Team, MDNR Fisheries biologist, and/or local watershed council is required. Individuals conducting stream assessments, designing, supervising construction, and approving the final installation will meet the requirements identified in the Michigan Job Approval Authority List.

Planned stream habitat improvements will address the aquatic species and life history stages for which the stream is being managed and when applied will result in a conservation system that meets or exceeds the minimum quality criteria for stream habitat established in Section III of the Field Office Technical Guide (eFOTG). Guidance for stream restoration can be found in the NRCS Stream Restoration Guidance Handbook (NEH-654) and the NRCS Stream Corridor Restoration Principles, Processes, and Practices Handbook (NEH-653).

Where practical, restore or maintain stream habitat and channel forming processes such as natural flow regime, meander migration, sediment transport, recruitment and retention of large wood, and floodplain interactions with the stream.

Manage adjoining riparian areas to support diverse natural vegetation suitable for the site conditions and desired ecological benefits. Such benefits include stream temperature moderation, recruitment of instream large wood and fine organic matter, input of riparian nutrients and terrestrial insects, streambank stability, and filtration of contaminants from surface runoff.

Use vegetation adapted to the site that will accomplish the desired purpose. Preference shall be given to native species in order to minimize the introduction of invasive plant species. If native plant materials are not adaptable or proven ineffective for the planned use, then non-native species may be used. Refer to the eFOTG, Section I, Invasive Plant Species for plant materials identified as invasive species.

Design in-stream structures that are compatible with the dynamic nature of streams and rivers and minimize disruption of recreational or other traditional uses of the stream corridor. Structures installed for the purposes of this standard will not impede or prevent passage of fish and other aquatic organisms, cause excessive bank erosion, cause unattended lateral migration, aggradation or degradation of the channel, and hinder channel-floodplain interactions.

Conservation Practice Standards

- ▶ Definition
- ▶ Purpose
- ▶ Condition Where Practice Applies
- ▶ Criteria
- ▶ Additional Criteria to Enhance Wildlife Habitat
- ▶ Plan of Work
- ▶ Specifications



Management Options

- ▶ Slope Back Bank
- ▶ Armor
- ▶ Add Instream Habitat Structures
- ▶ Revegetate



Conservation Practices

Stream Habitat Improvement and Management (Acre) 395

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▶ Stream Habitat Improvement and Management – Code 395

▶ Streambank and Shoreline Protection - Code 580

Management Choices

- ▶ Slope Back Bank
- ▶ Revegetate
 - ▶ Native
 - ▶ Site Suitability
 - ▶ Soils
 - ▶ Branch Packing
 - ▶ Live Stake
 - ▶ Tree Planting

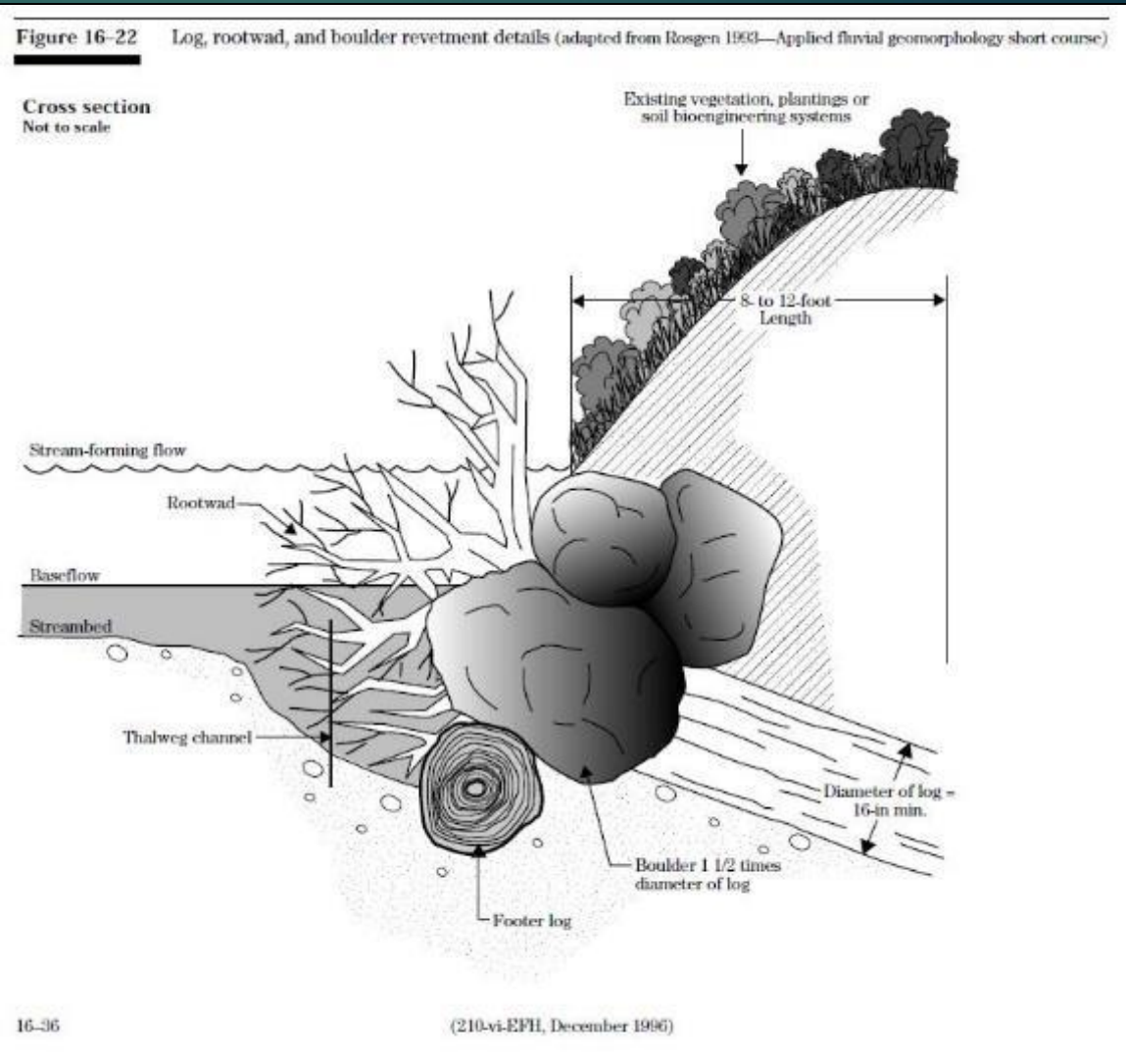


Management Choices

► Add Armor

► Wood

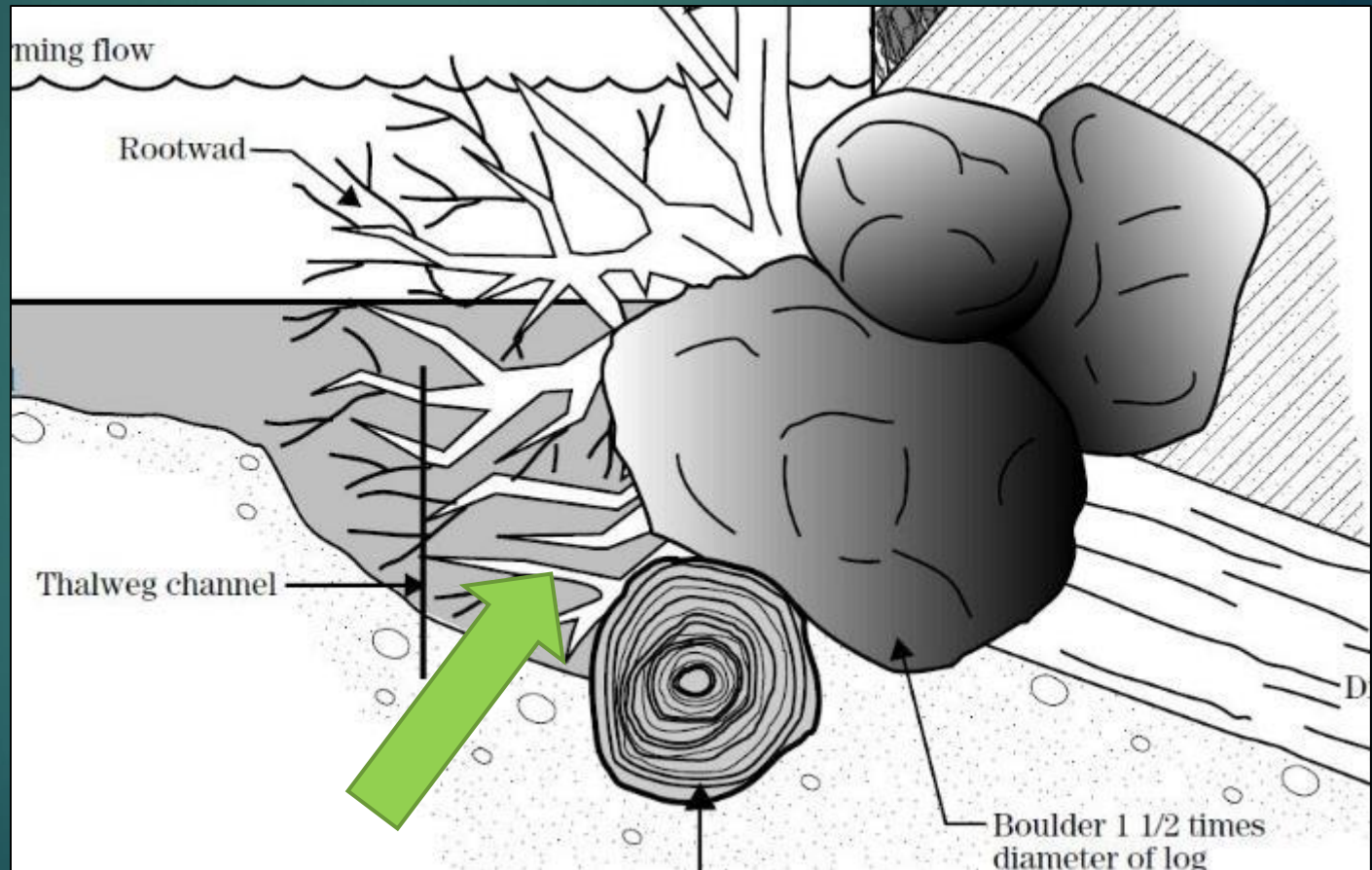
► Rock



Management Choices

▶ Add Armor

▶ Wood



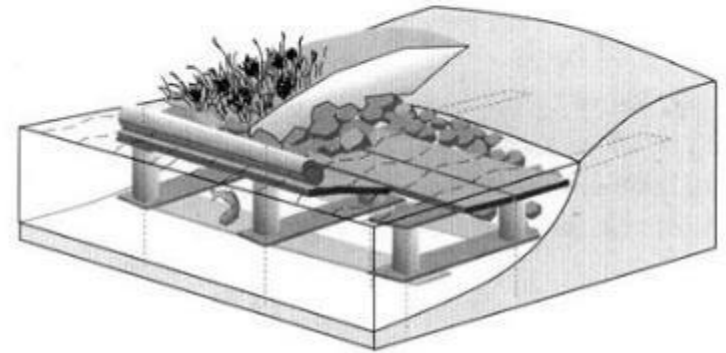
Management Choices

▶ Add In Stream Habitat Structures

▶ LUNKERS



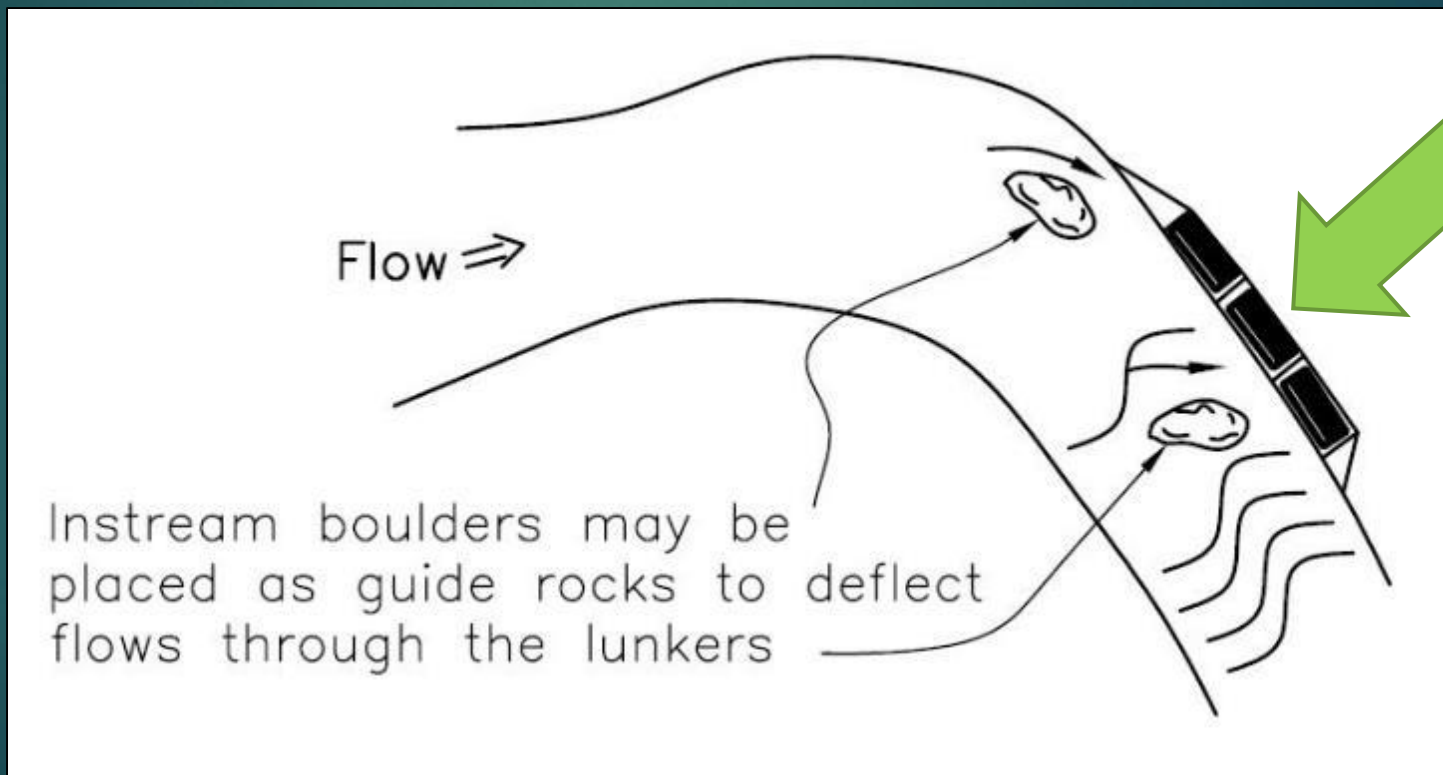
Lunker Structures



Cells constructed of heavy wooden planks and blocks which are imbedded into the toe of streambanks at channel bed level to provide covered compartments for fish shelter, habitat, and prevention of streambank erosion.

Management Options

- ▶ Add In Stream Habitat Structures
 - ▶ LUNKERS



Escanaba River

- ▶ Erosion from high flows
- ▶ Vegetation killed by foot traffic
- ▶ Rock and LWD in system
- ▶ Rock toe protection w/plantings
- ▶ Log crib wall



Yellow Dog River

- ▶ Bank scour undermined tree roots
- ▶ No vegetation/roots to hold soil
- ▶ Sand and LWD in system
- ▶ Rootwad and stone toe
- ▶ Slope shaping
- ▶ Revegetate slope



Roubillard Creek

- ▶ >2' perched outlet
- ▶ Steep slope in culvert
- ▶ Bankfull width = 7' - 8'
- ▶ Step pools present upstream
- ▶ Stable reference reaches
- ▶ 9.5' culvert with rock bottom



Summary

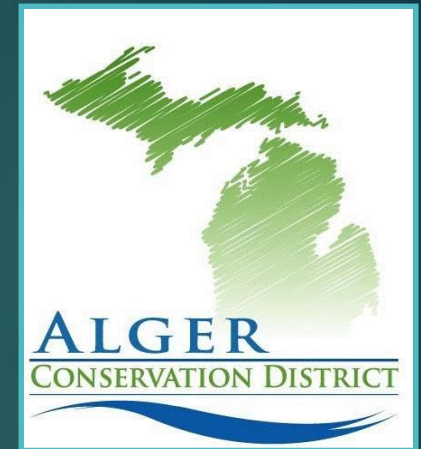
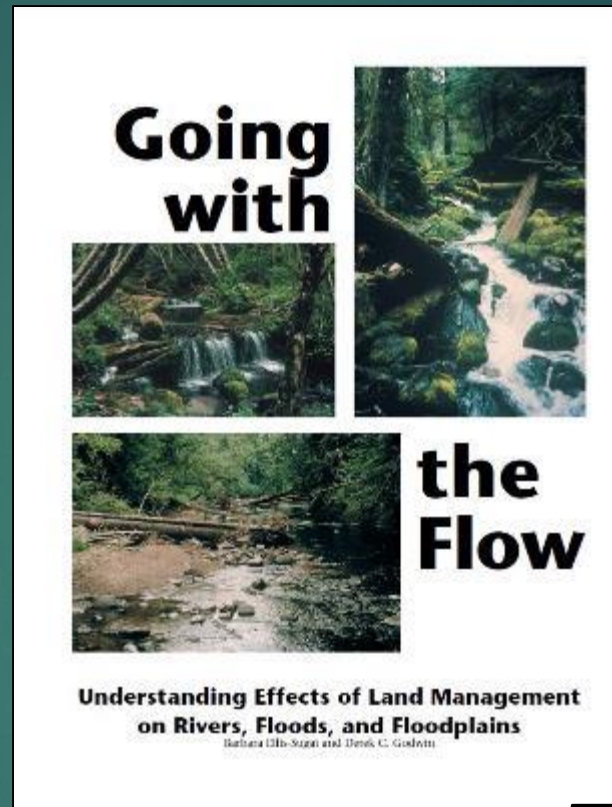
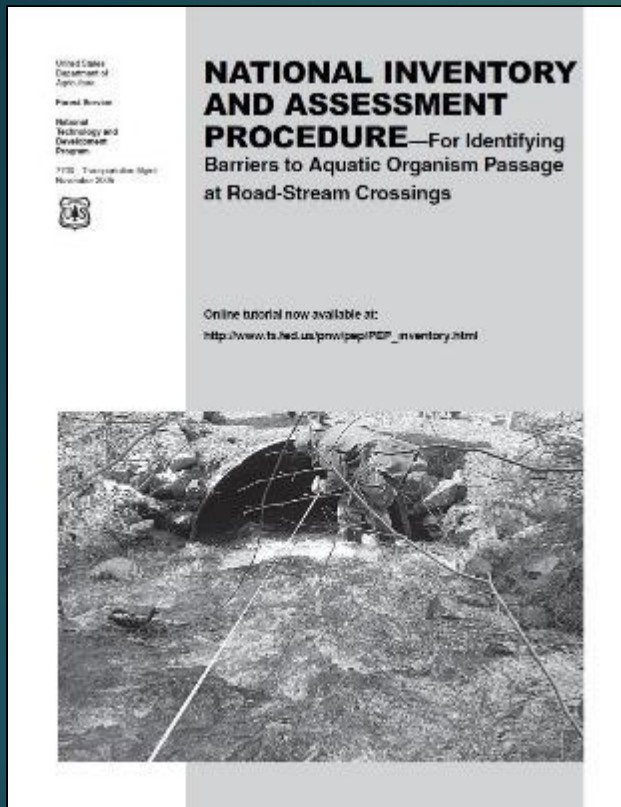


- ▶ **Goals and Objectives**
- ▶ **Understand Location**
- ▶ **Inventory & Evaluate**
- ▶ **ID Resource Concerns**
- ▶ **Match to Practices**

- ▶ **Plan and Design**
- ▶ **Build**



Stream Habitat Resources



USDA – NRCS Engineering Field Handbook
Technical Supplement 140 – Stream Habitat
Enhancement Using LUNKERS

Questions? – Trees are the answer.

