

Stream Stability Assessment

Soil and Water Quality Funding Summit

February 6, 2015



Causes of Streambank Failure

- Toe Scour
- Local Scour
- Mass Failure/Pore Pressure
- Geotechnical / Geologic Problems
- Head Cuts / Channel Lowering

Toe Scour



Toe Scour



Other Factors



Local Scour



Pore Pressure / Pop Out



Head Cut



Head Cut



A River is Part of System

- The entire watershed forms a system
 - Rainfall => Runoff (Land Use)
 - Runoff Transports Sediment
 - Slope / Meanders Impact Transport
 - Sediment Size Impacts Transport and Erosion/Deposition
 - Manmade Features Impact Everything
 - Nature has its own plans and goals!!!
 - It's not always what we expect!

Causes of System Instability

- Upstream Changes
 - Changes in Inflowing Water or Sediment
- Downstream Changes
 - Base Level Lowering
- Basin Wide Changes
 - Urbanization / Land Use Changes

Unstable



Remember:

Changes in Watershed
Equals
Changes in Stream
Morphology

Possible Solutions

- Grade Control – Western Iowa
- Bank Protection
 - Bioengineering Techniques
 - Redirective Techniques
 - Resistive Techniques

Redirective Techniques

- Dikes
 - Palisades
 - Retards
 - Jacks (Large Type)
 - Jetties
 - Spurs
- Vanes
- Bendway Weirs

Bendway Weirs

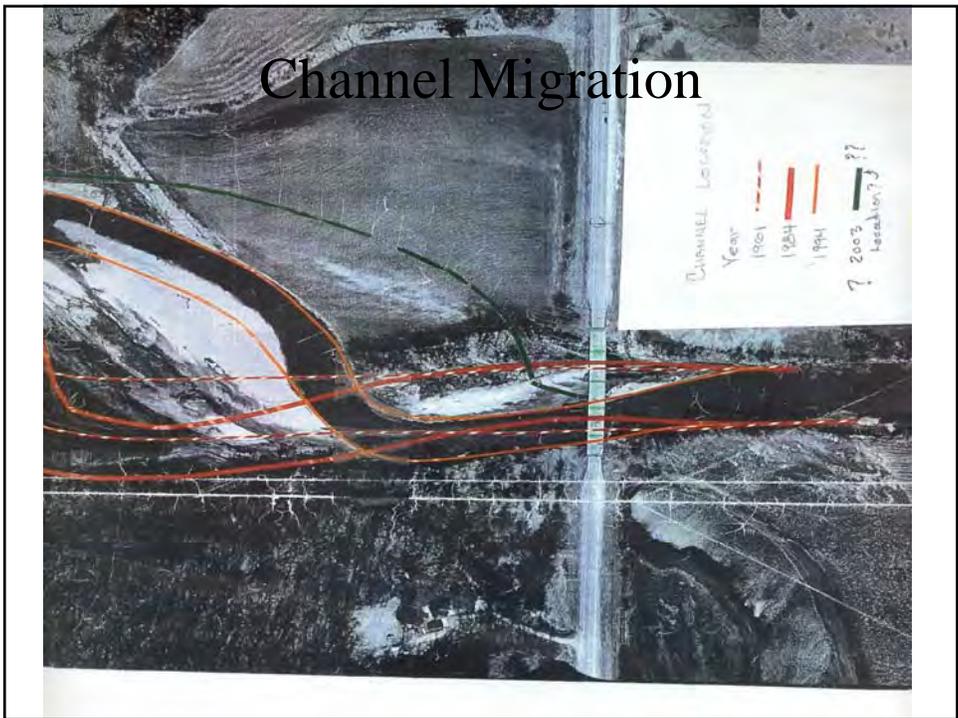


Bendway Weirs



Bendway Weirs + Peaked Stone Toe

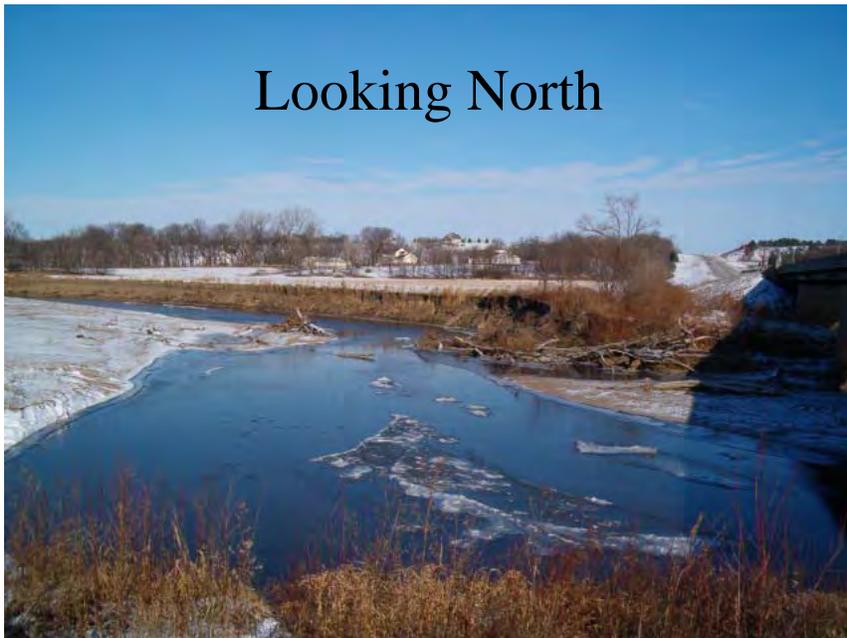




U.S. 169 – S. Raccoon River



Looking North



US 169 – S. Raccoon River



Starting Work – 2/2006



Excavation of Sandbar



Looking D.S. from sandbar





Looking U.S. 3/2006







www.iowadnr.com/water/stormwater/forms/streambank_man.pdf

**How to Control
Streambank Erosion**

Updated 2005



IOWA Department of Natural Resources

Questions?