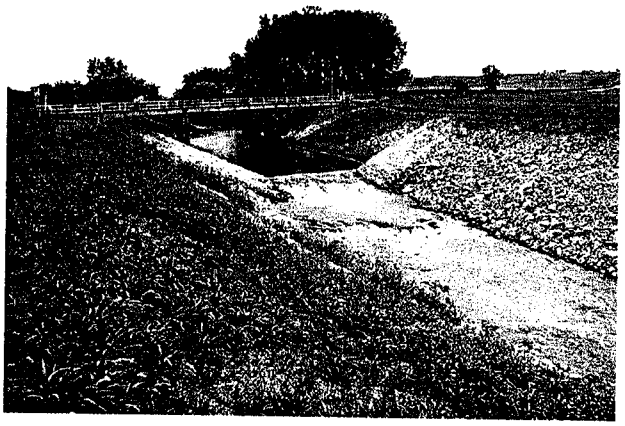
HUNGRY CANYONS ALLIANCE
Streambed Stabilization Program

Background: Stream channel erosion has caused more than $1.1 billion in damages to public and private infrastructure and farmland in the deep loess soil region of western Iowa. This erosion has been greatly accelerated by the channelization of streams and land use changes during the first half of the 1900's. Damages caused by stream channel erosion include the failure of highway bridges, destruction of utility lines, and loss of productive farmland. A survey of western Iowa bridges revealed that 404 are endangered by stream channel erosion. Local, county, state, and federal resources protect threatened bridges, utilities, and farmland through the construction of stream stabilization structures. The Hungry Canyons Alliance makes these resources available to its 22 counties through a cost share program. Since 1992, the program has provided the technical assistance and funds needed to complete 135 grade stabilization structures in western Iowa. Another 44 structures are in progress. The Hungry Canyons Alliance streambed stabilization structures, with an average cost share of $51,850, protect approximately $261,790 in property per structure. That means, for every dollar invested in a Hungry Canyons Alliance streambed stabilization structure, $4.48 in property value is protected.

COSTLY PROBLEM



AFFORDABLE SOLUTION

Fiscal Year 2001: The Hungry Canyons Cost-Share Program approved 39 streambed stabilization structures in 11 counties for a total cost share of $2,293,860. Cost share funds for the structures were provided by the State of Iowa ($1,500,000), by the US Congress through the USDA Natural Resources Conservation Service ($ 750,000), and by county governments who provide a minimum of 20% match. These structures will protect 36 state and county bridges, hundreds of feet of utility lines and culverts, hundreds of acres of valuable farmland, and avoid traffic rerouting costs. Hungry Canyons structures extend the life of old bridges and protect new ones.

Fiscal Year	# of Grade Stabilization Structures	Total Cost of Structures	Value of Bridges Protected	Value of Other Infrastructure Protected	Value of Farmland Protected	Total Value of Property Protected
2001	39	$2,752,600	$9,217,000	$58,000	$430,000	$9,705,000

Table 1. A summary of the impact that streambed stabilization structures will have on threatened infrastructure and land in 2001.

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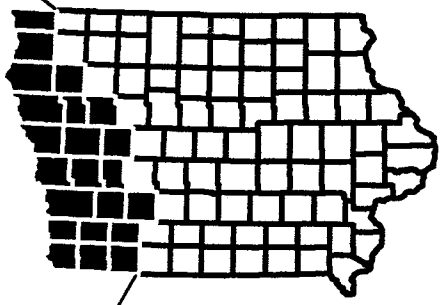
Susceptible Bridges and Hungry Canyons Alliance Streambed Stabilization Structure Locations

within 22 county region



- locations of 404 bridges identified as endangered by stream degradation
- locations of 179 Hungry Canyons Alliance structures
- major stream
- interstate highway
- county line
- incorporated cities

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Hungry Canyons Alliance

Stream Stabilization in Western Iowa

Russell Joyce, Cass County Board of Supervisors

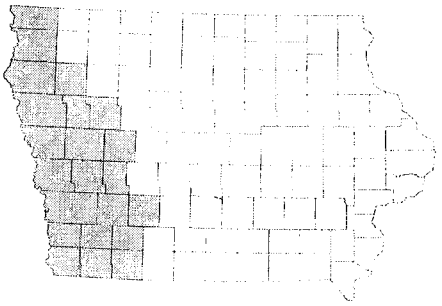
Paul Assman, Crawford County Engineer

Bernie Bolton, East Pottawattamie SWCD Commissioner

Arlyn Danker, Chairman

John Thomas, Project Director
Hungry Canyons Alliance

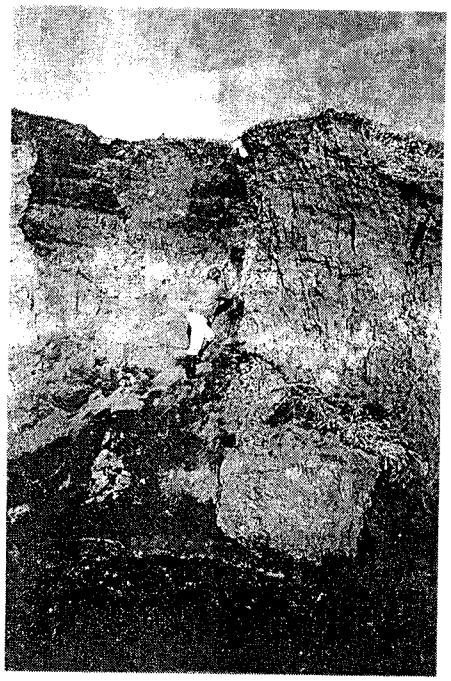
Loess Soils of Western Iowa

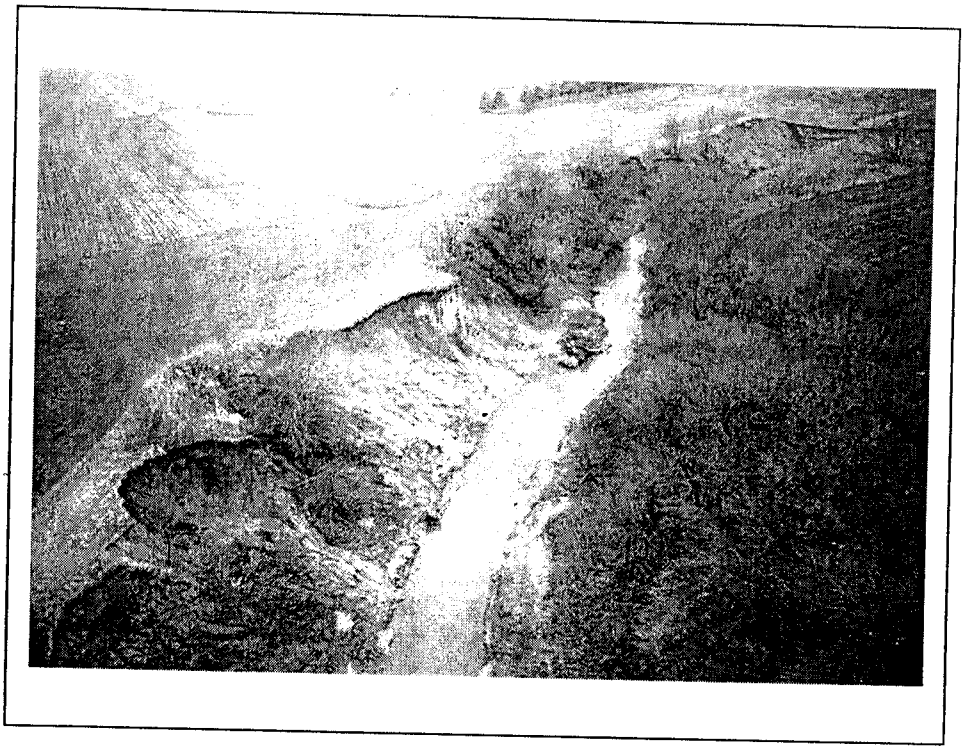


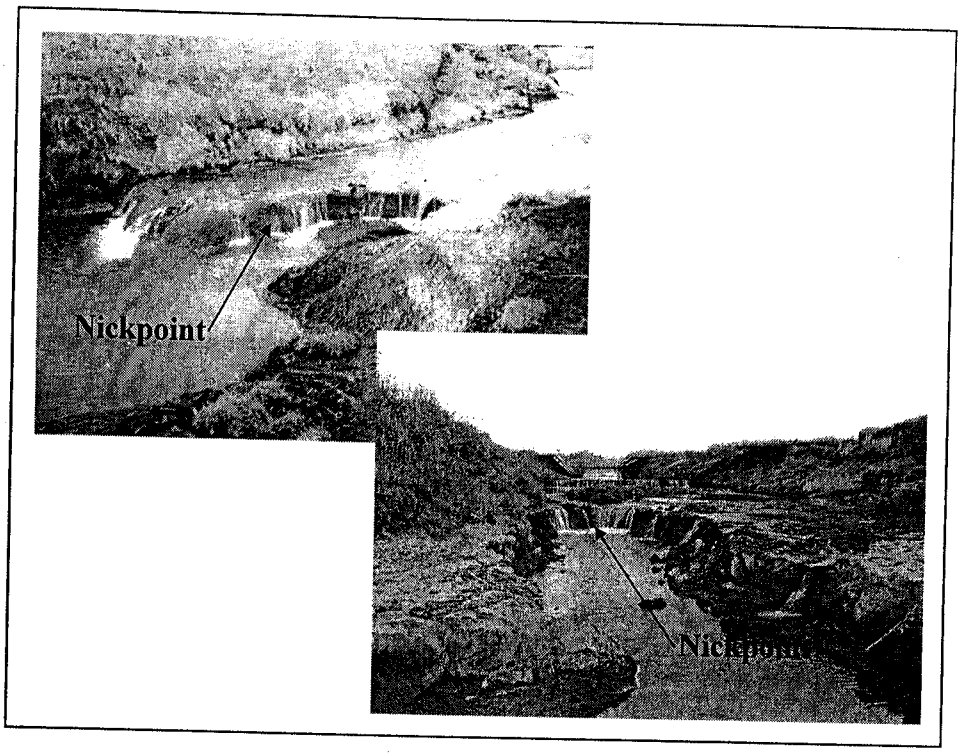
- Depth – 13 to 200+ feet
- Highly erodible
- Stream degradation
  - $1.1 billion in damage
  - Loss of farmland
  - ↑ sediment loads
  - ↓ water quality

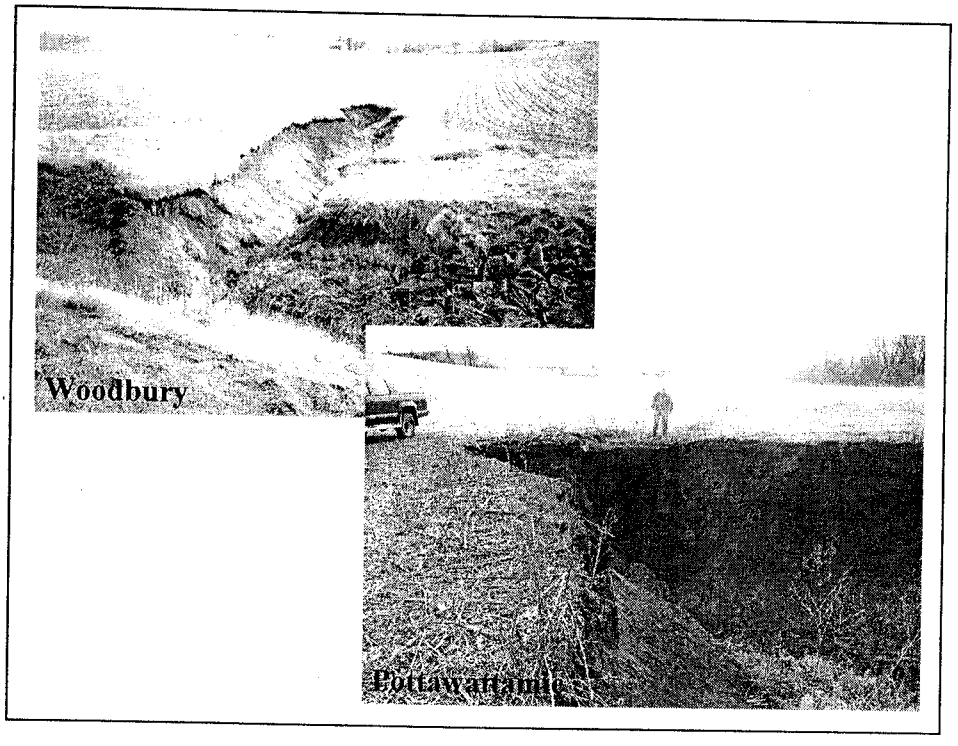
Causes

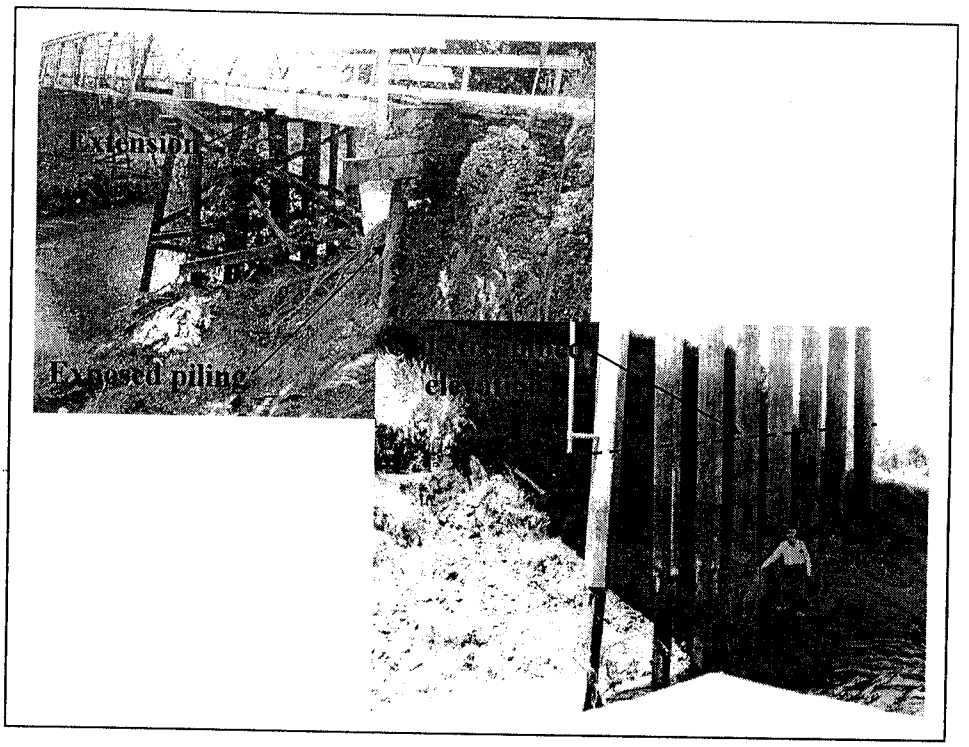
- Stream straightening and land use changes
- Higher water velocities
- Meander or downcut
- Accelerated soil erosion

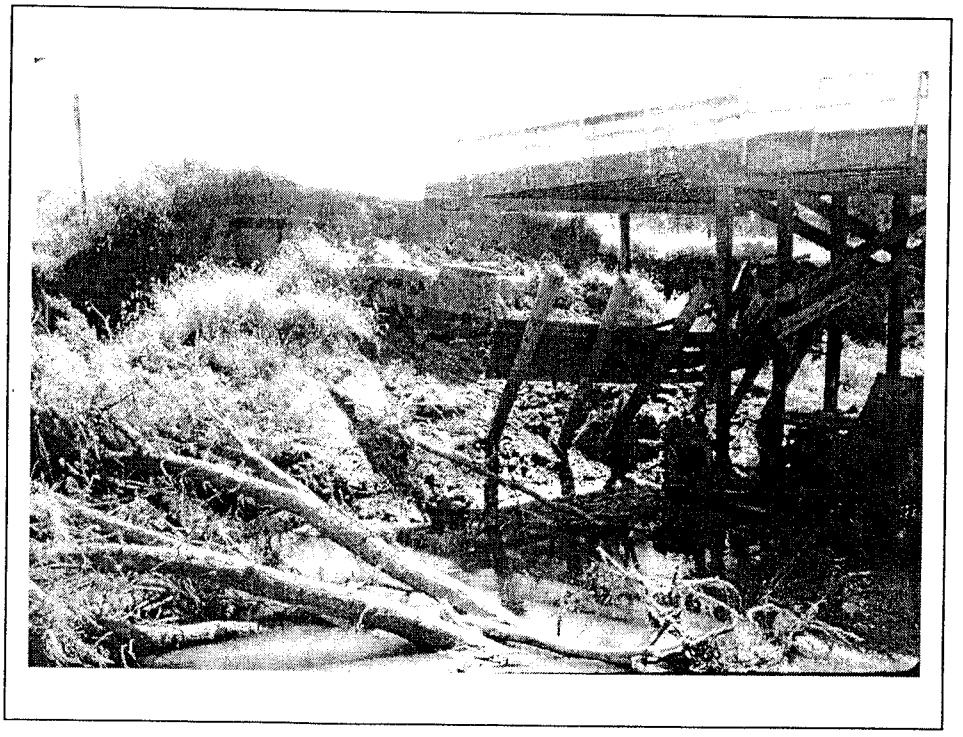





Nickpoint
Nickpoint


Woodbury
Pottawattamie

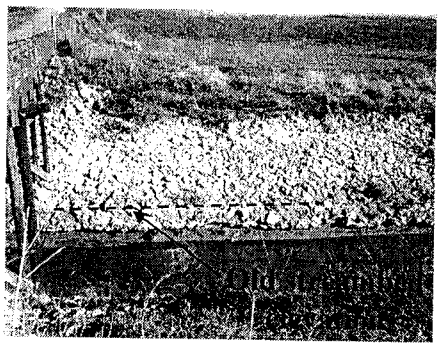

Extension
Exposed piling



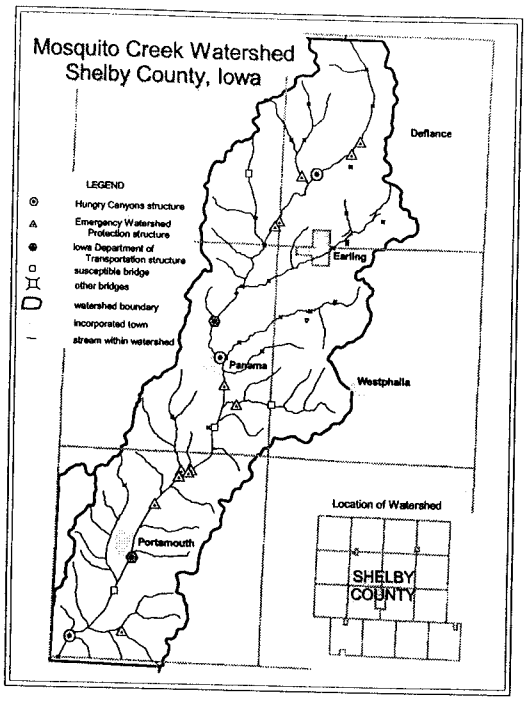
Purpose

- To focus attention on the problems of, and develop solutions related to, stream channel degradation in the deep loess soils region of western Iowa

Streambed Stabilization



- Key to preventing further erosion and protecting infrastructure
- Structures at regular intervals change the stream profile from erosive steep incline to stable stair-step pattern

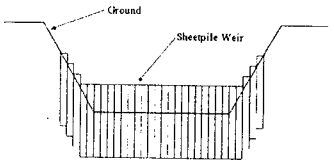


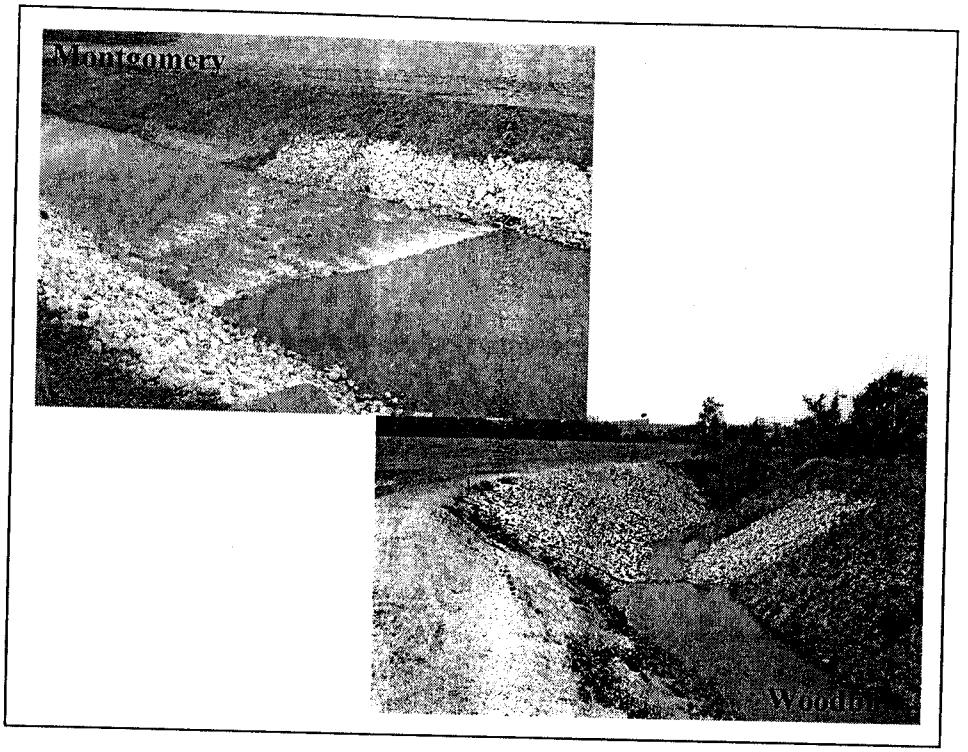
Watershed Consciousness

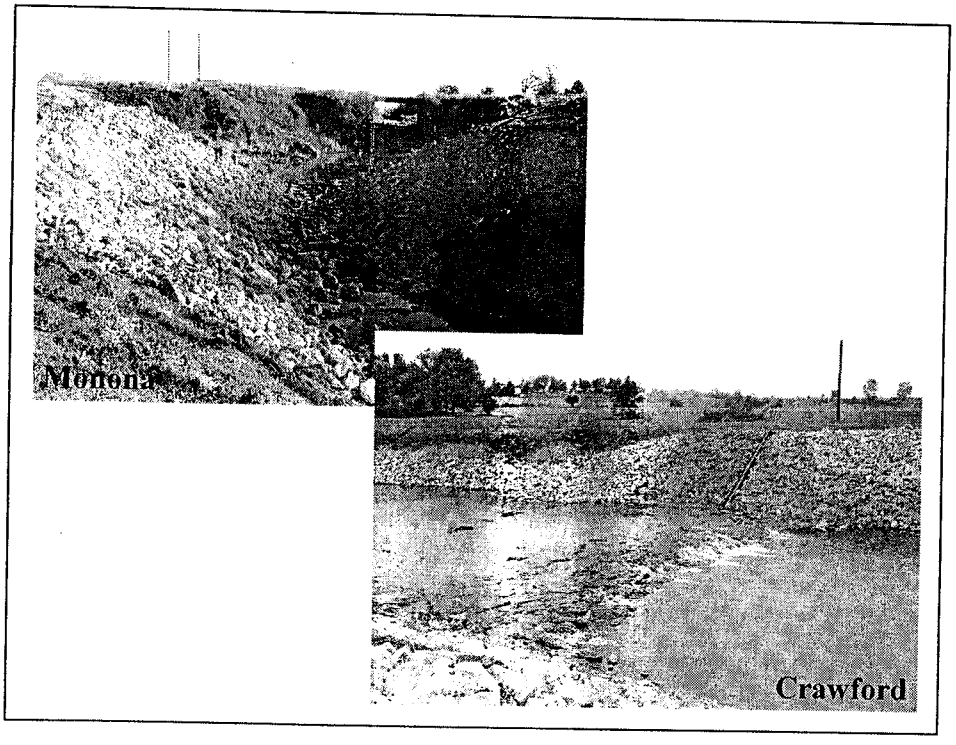
- Nickpoints affect entire watershed as erode upstream
- Structures planned on watershed scale
- Site locations planned across political boundaries

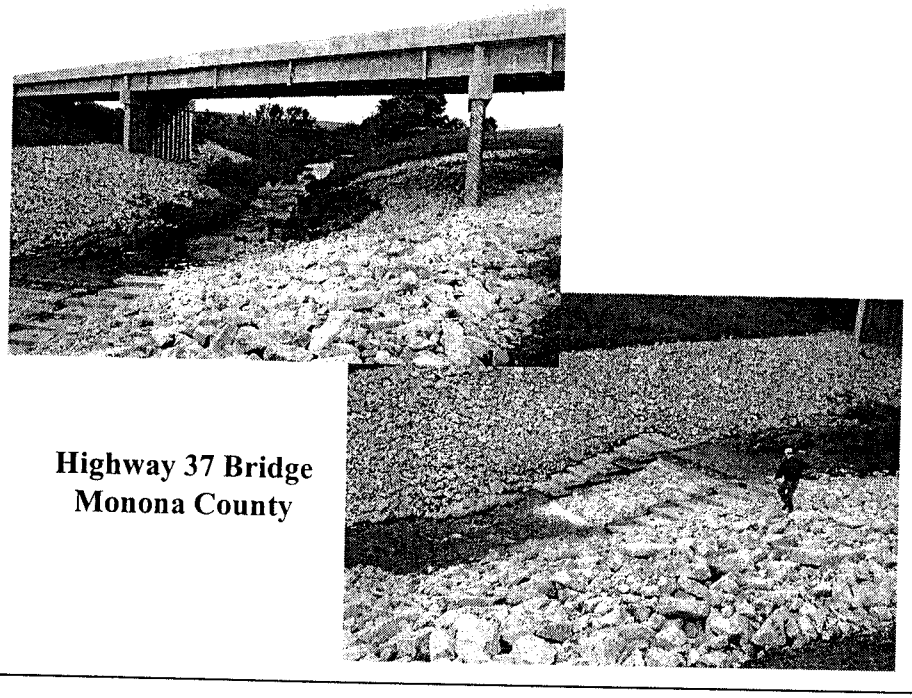
Streambed Stabilization Structures

- Raised weir section
- Steel sheet pile and rip-rap
- Decreases slope of streambed
- Prevents further downcutting
- Creates an upstream backwater condition
  - Sediment settles out upstream
  - Reduces sediment loads and TMDL's
  - Protects bridge pilings




Montgomery
Woodford


Monona
Crawford



Highway 37 Bridge
Monona County

Streambed Stabilization Research

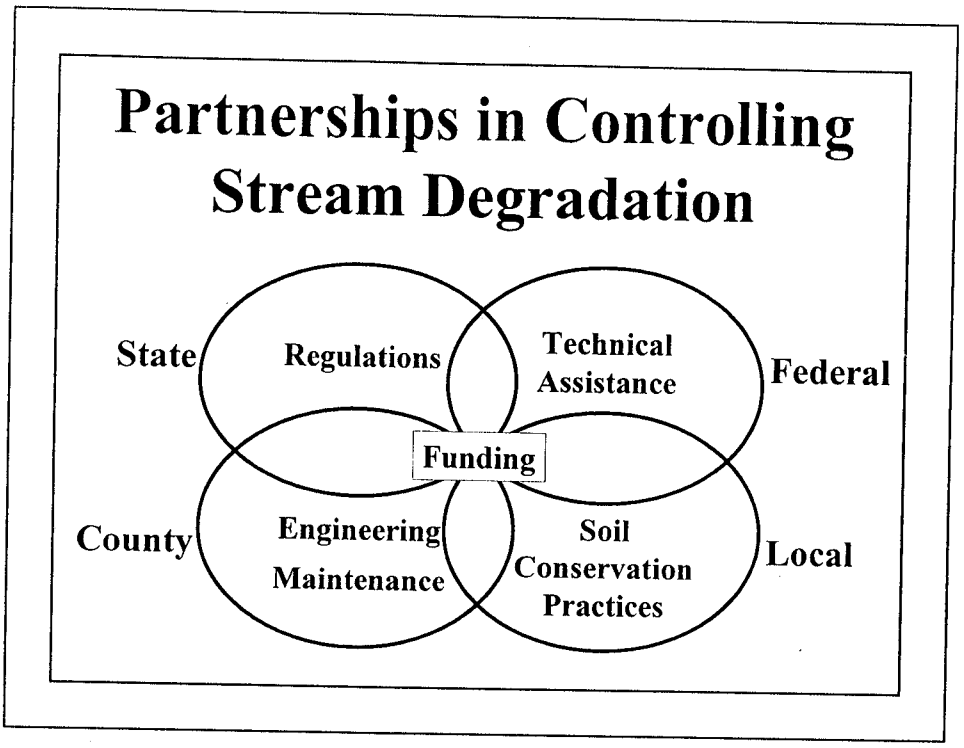
- Stream classification in 1993-1994
- Effective stabilization techniques and design manual in 1996
- Susceptible bridge identification in 2000
- Stream classification in 2002-2003

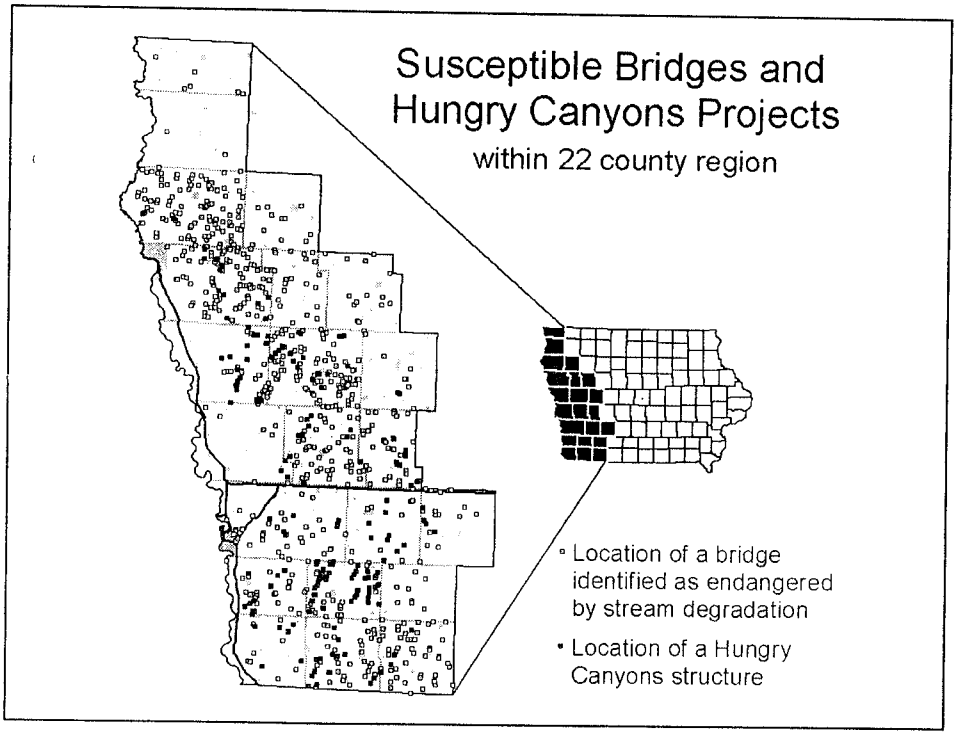
Structures & Impact

- Structures (1992-2001)
  - 179 structures approved for cost share
  - 135 completed, 44 in progress
  - Average cost share: $ 51,850
  - Average total cost: $ 67,190
- Impact (1992-2001)
  - Total property protected: $ 46,860,400
  - Property protected per structure: $ 261,790

Benefits

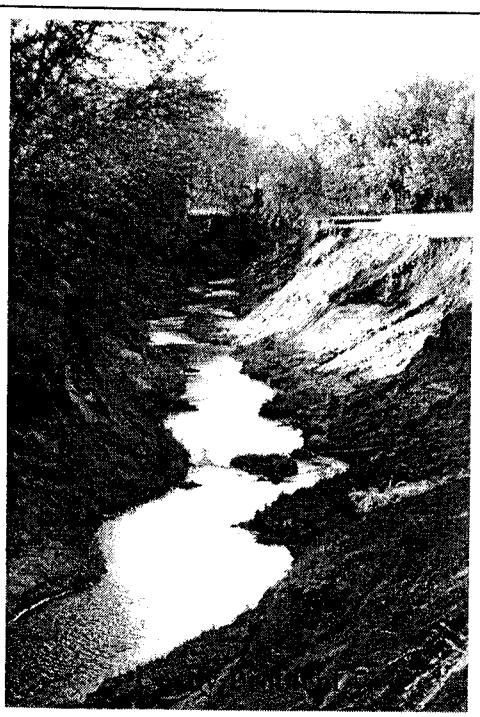
- Benefits (1992-2001)
  - 172 bridges protected
  - Protection of numerous utility lines (electric, phone, gas, sewer, water)
  - Protection of farmland
- **For every $1 invested in Hungry Canyons Alliance structures, $4.48 in property value is protected.**


Partnerships in Controlling Stream Degradation
State
Regulations
Technical Assistance
Federal
Funding
County
Engineering Maintenance
Soil Conservation Practices
Local


Susceptible Bridges and Hungry Canyons Projects
within 22 county region
Location of a bridge identified as endangered by stream degradation
Location of a Hungry Canyons structure

Hungry Canyons Streambed Stabilization

- Protects farmland
- Protects bridges and utility lines
- Reduces sediment loads
- Improves water quality
- Prevents soil movement into the Missouri River
- Reduce the "dead zone" in the Gulf of Mexico



Affordable Solution