

Riparian Corridors in the Red River Basin

**A
Red River
Regional Council/
Red River RC&D
Project**



What's the problem?

- Rivers and streams are impaired in 49 of 52 states and territories (225,000 mi.)
- Nonpoint Source Pollution is the leading cause of impairment
 - 60% Agriculture
 - 17% Hydrologic or Habitat Modification
 - 10% Riparian Vegetation Removal
 - 70-90% Natural Riparian Ecosystems Gone

What's the problem?

- North Dakota UWA (1999 305(b) Report)
 - 50% of subwatersheds in RRB are considered in need of restoration.
 - Agriculture is major stressor.
- Minnesota (1996 305(b) Report)
 - Nearly 50% of miles assessed were impaired.
 - Bacteria, turbidity, & habitat alteration are major stressors.

WATERSHEDS OF THE RED RIVER BASIN

MANITOBA



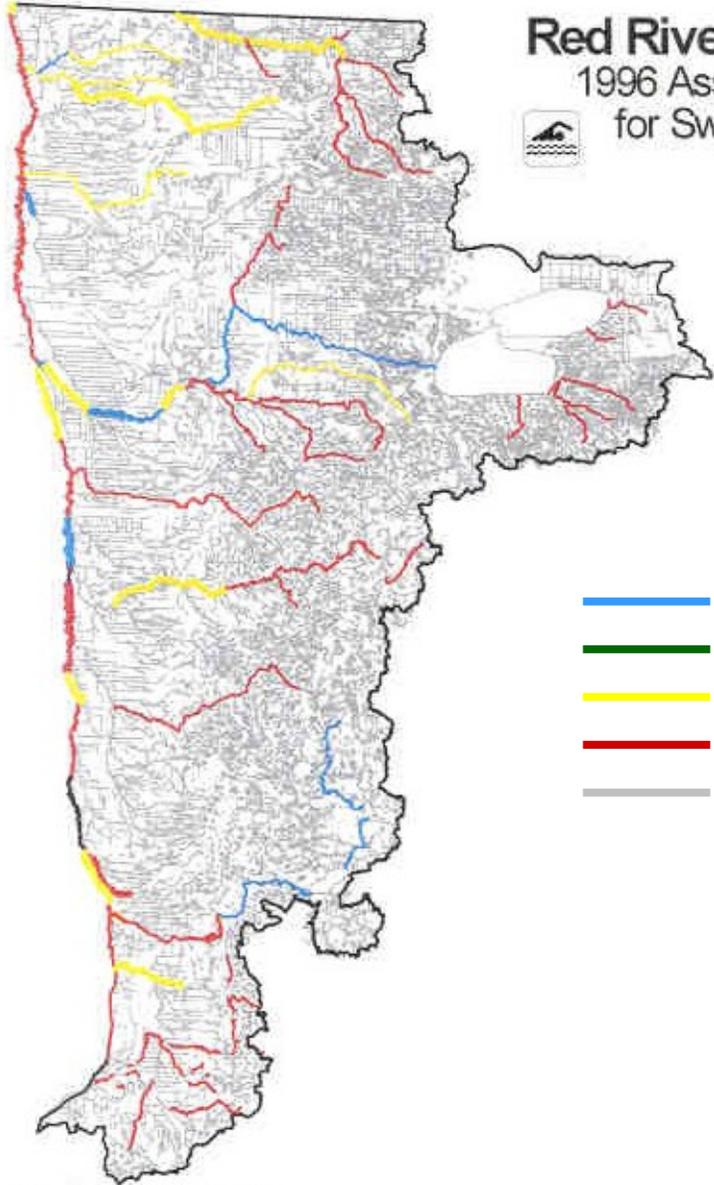
NORTH
DAKOTA

MINNESOTA

0 35 70
Miles

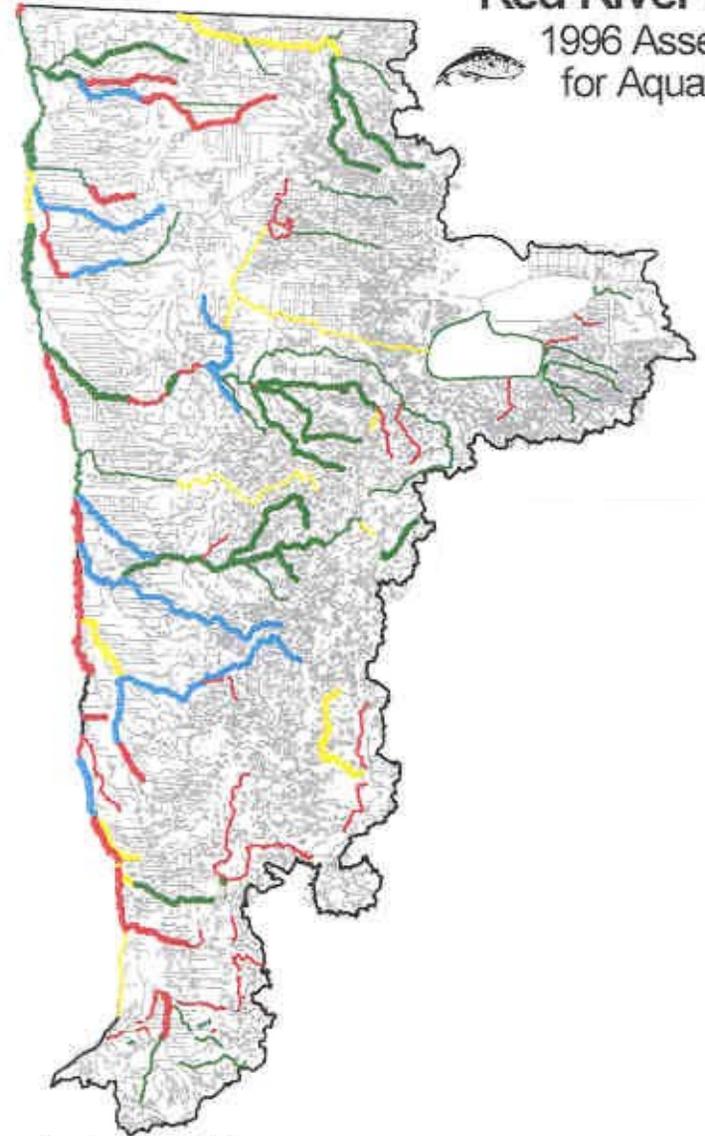
SOUTH
DAKOTA

Red River Basin 1996 Assessment for Swimming



-  Good
-  Threatened
-  Fair
-  Poor
-  Not Assessed

Red River Basin 1996 Assessment for Aquatic Life





Congressional Solution

- Clean Water Act

- “The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

- Section 319

- Nonpoint Source Pollution

- \$\$ provided to the states

- Requires 40% local (non-federal) match

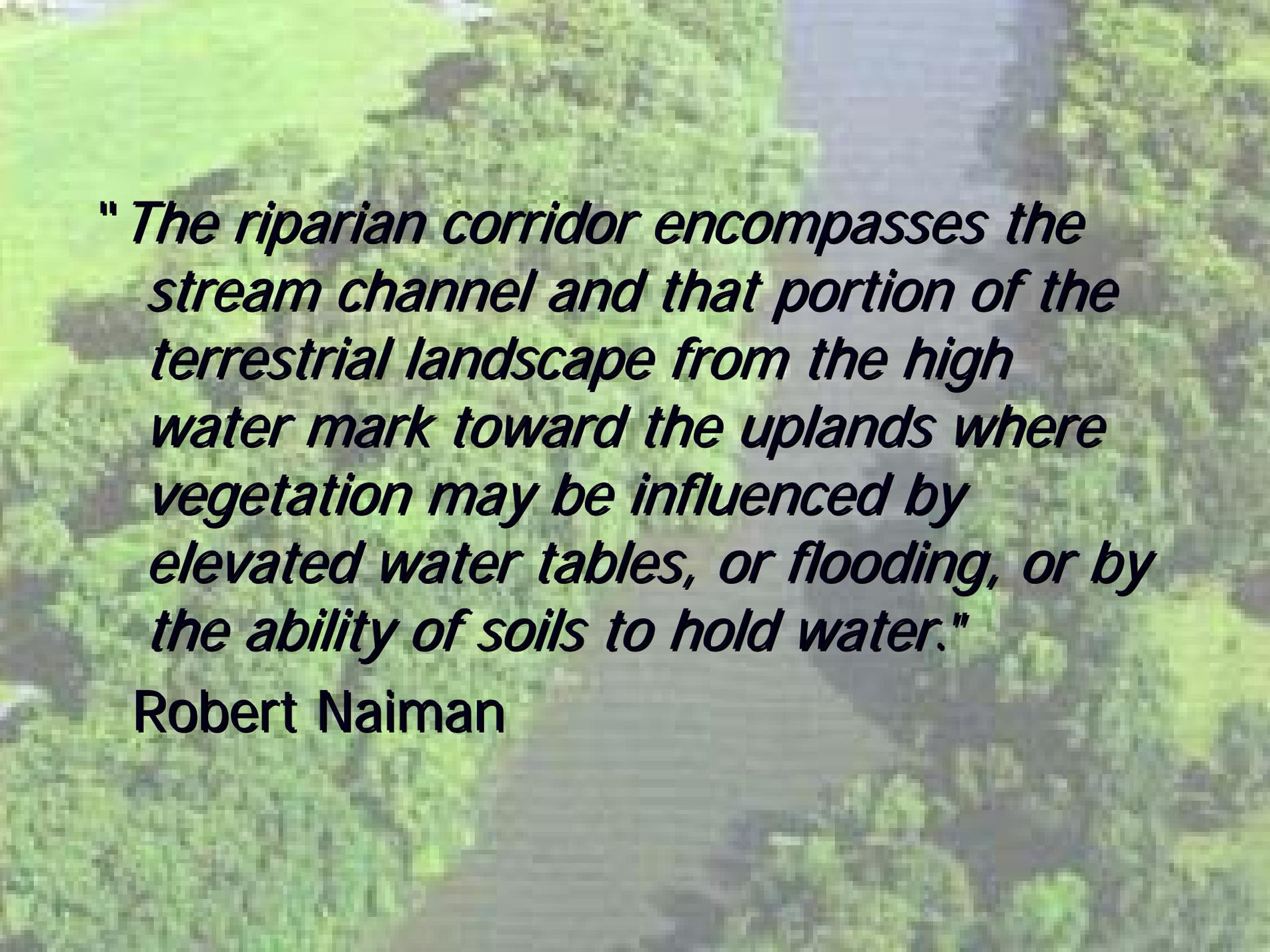
Red River Basin Riparian Project



What is Riparian?



- Adjacent to the river
- An ecotone
- Encompasses floodplain
- Benefits watershed

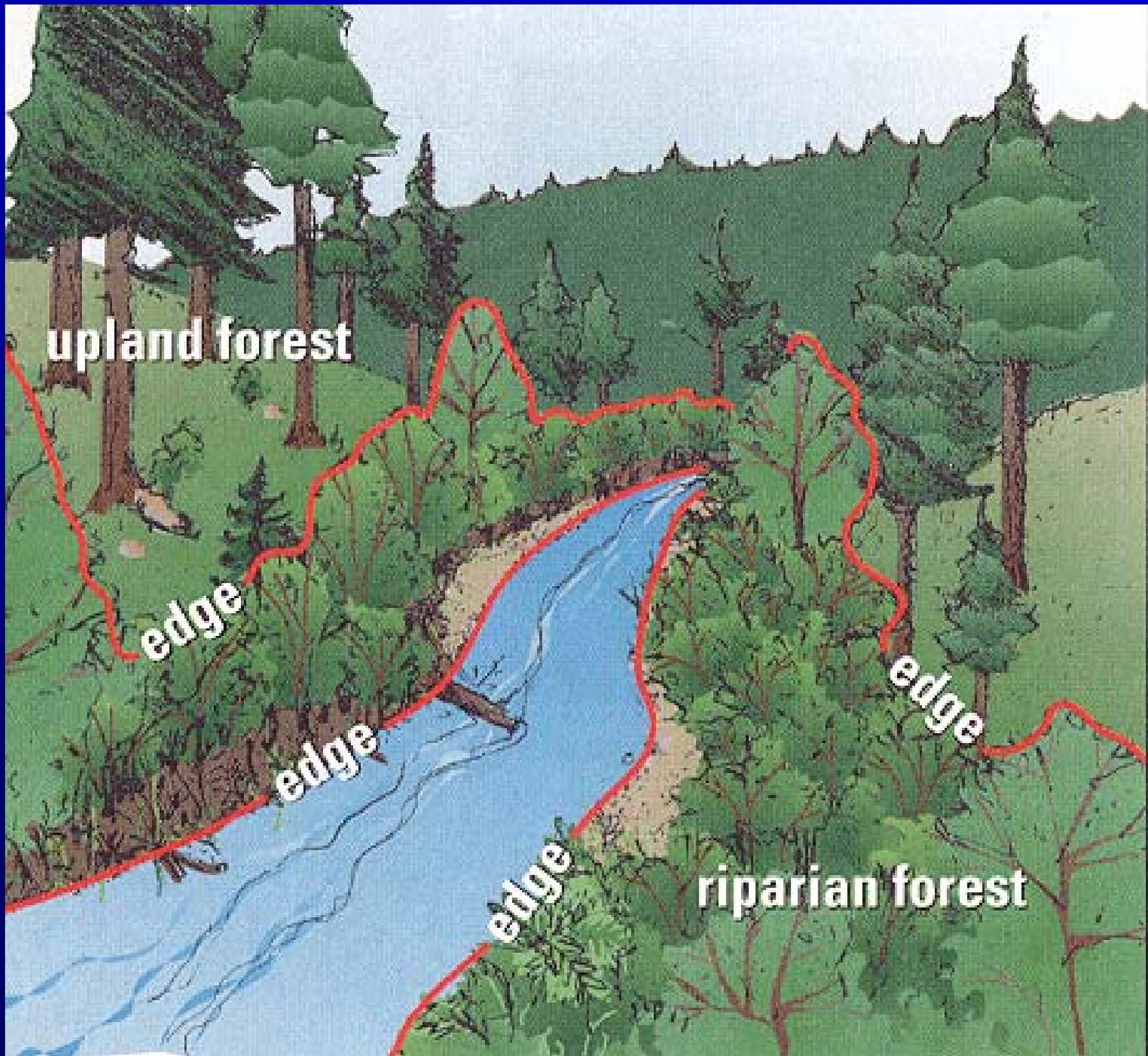


"The riparian corridor encompasses the stream channel and that portion of the terrestrial landscape from the high water mark toward the uplands where vegetation may be influenced by elevated water tables, or flooding, or by the ability of soils to hold water."

Robert Naiman

Definition of Riparian

- *"At the smallest scale, the riparian zone is the immediate water's edge where some specialized plants and animals form a distinct community.*
- *At a larger scale, the riparian zone is the area periodically flooded by high-water, the stream banks and floodplain.*
- *At the largest scale, the riparian zone is the band of land that has significant influence on the stream ecosystem, and/or is significantly influenced by the stream." Malcomb Hunter*



upland forest

edge

edge

edge

edge

riparian forest

Benefits of a Healthy Riparian Zone

An aerial photograph of a river winding through a dense, green forest. The river is a vibrant blue, contrasting with the surrounding lush vegetation. The banks are well-defined and appear to be covered in thick trees and shrubs, characteristic of a healthy riparian zone.

- Erosion Control and Streambank Stability
- Water Quality
- Wildlife Habitat and Biodiversity
- Flood Damage Reduction
- Recreation and Education

Erosion Control and Streambank Stability



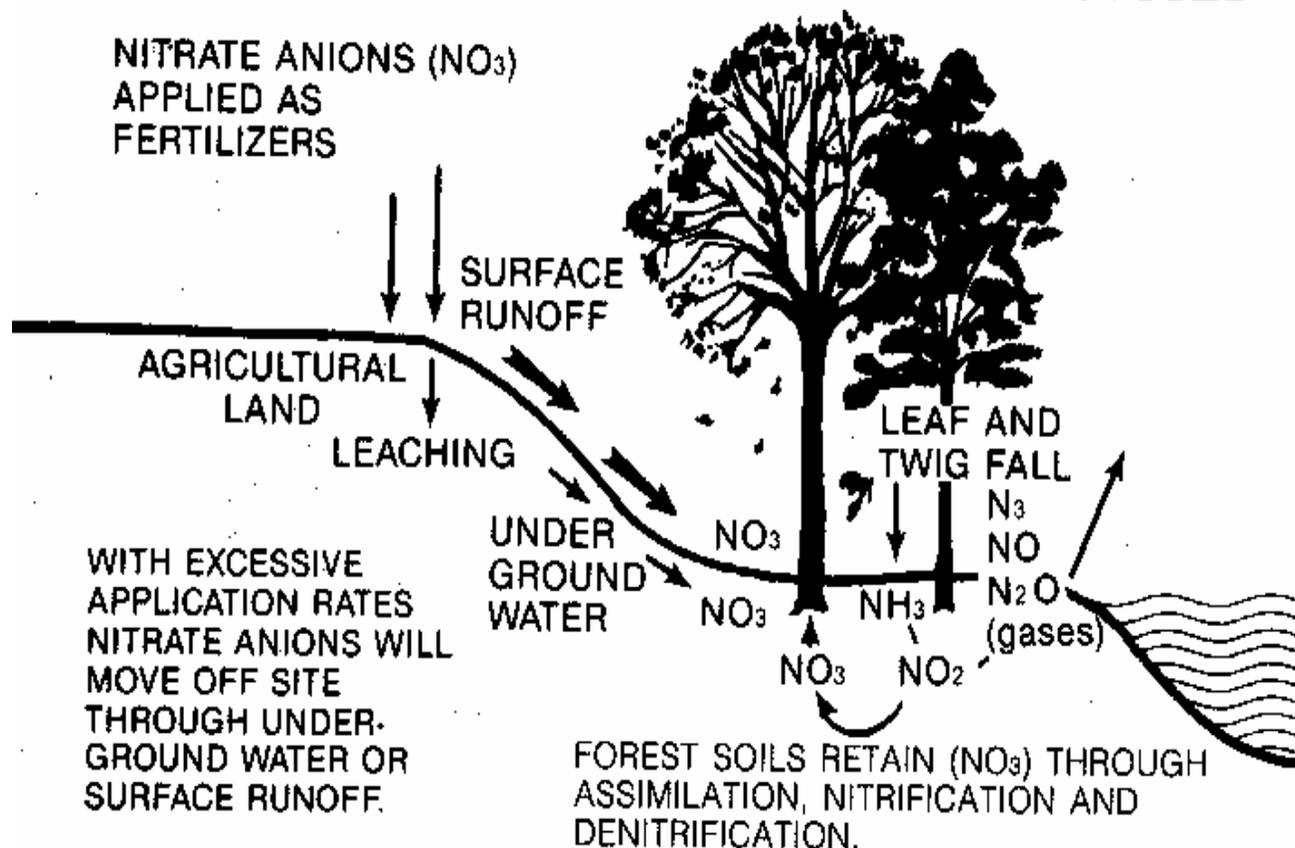


Water Quality

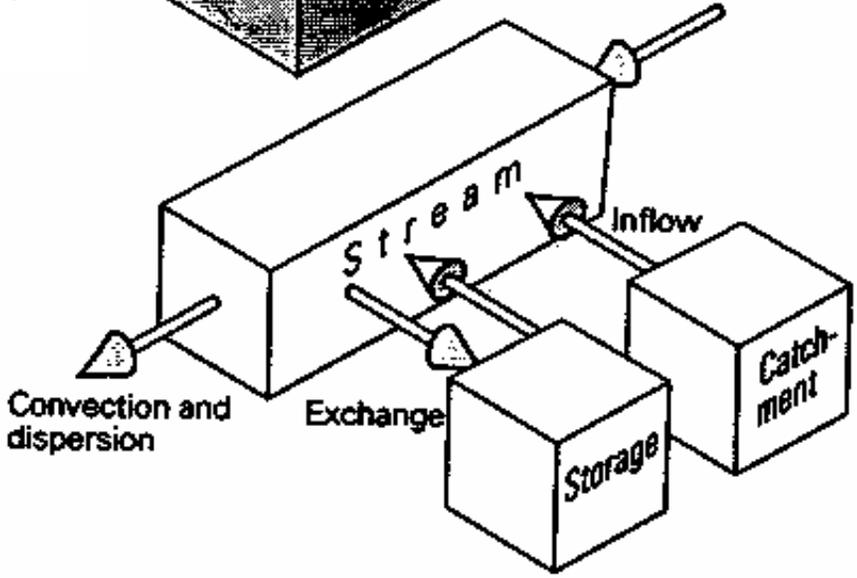
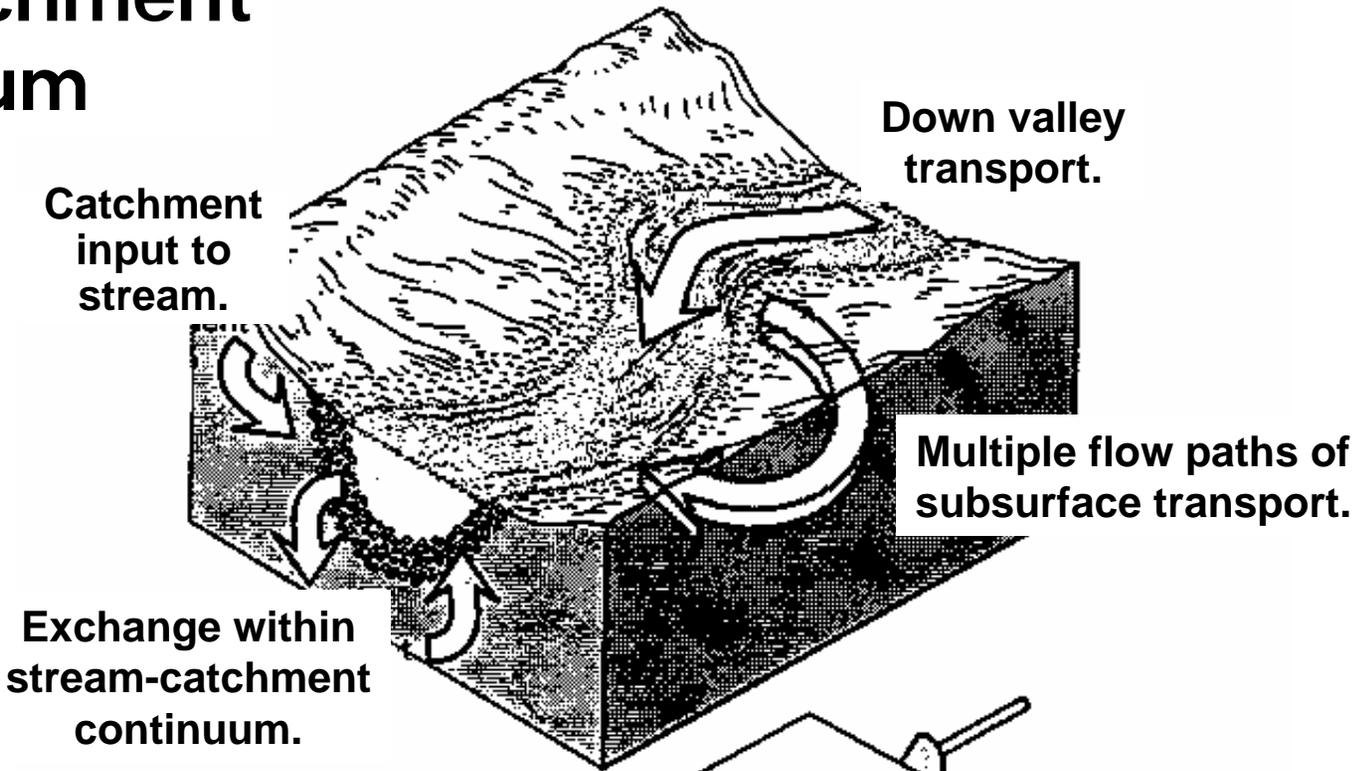
A large, mature tree with a thick trunk and dense green foliage stands in the foreground, partially obscuring a river in the background. The river flows through a lush, green landscape with more trees and vegetation on the banks. The scene is brightly lit, suggesting a sunny day.

- Filters sediment from runoff
- Transforms and sequesters nutrients
- Shades the river, moderating water temperatures
- Provides opportunities for storm water treatment

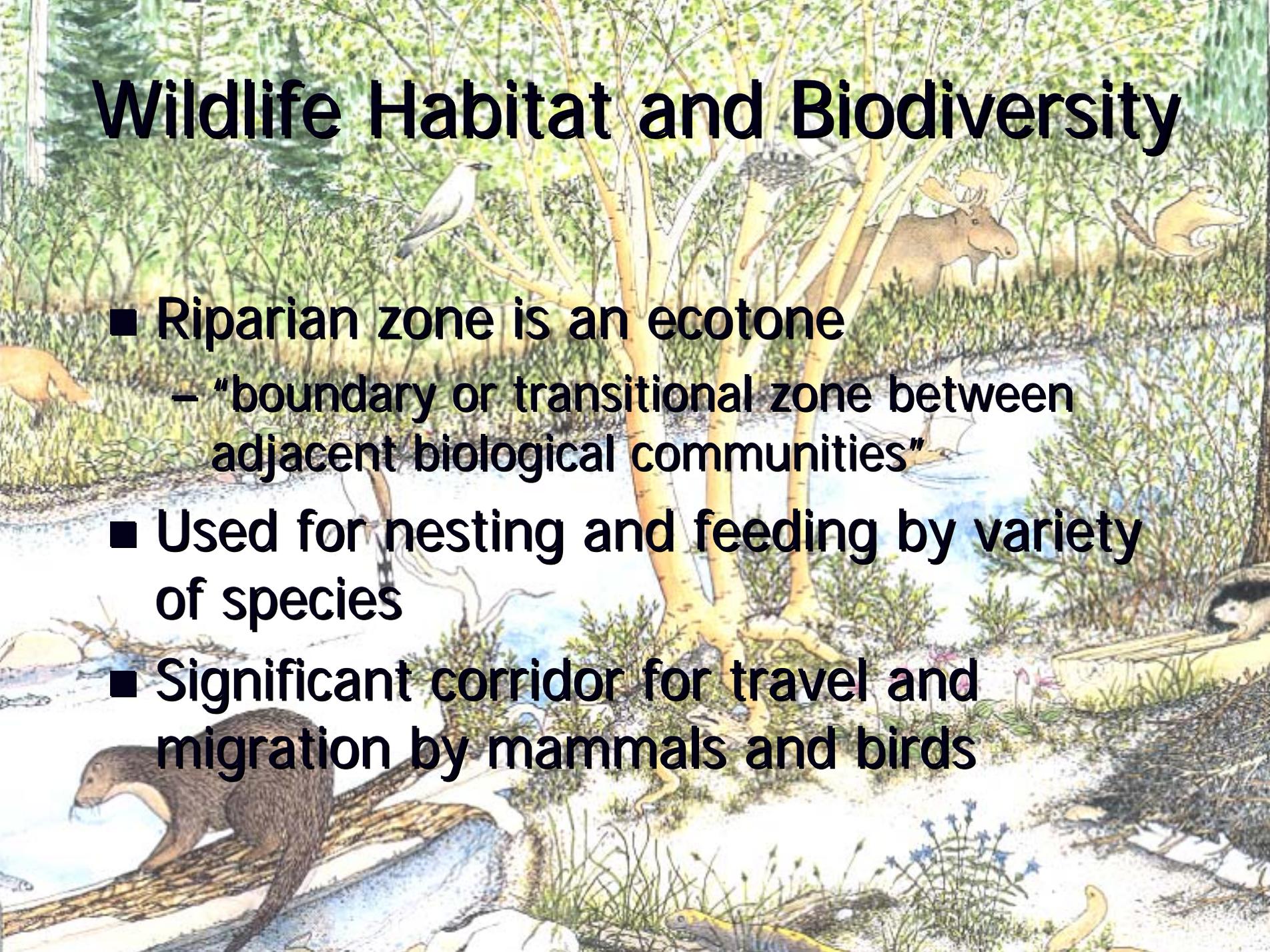
STREAMSIDE FORESTS TRANSFORM NITROGEN IN RUNOFF TO GAS OR USE IT IN GROWTH PROCESSES



Stream - catchment Continuum



Wildlife Habitat and Biodiversity

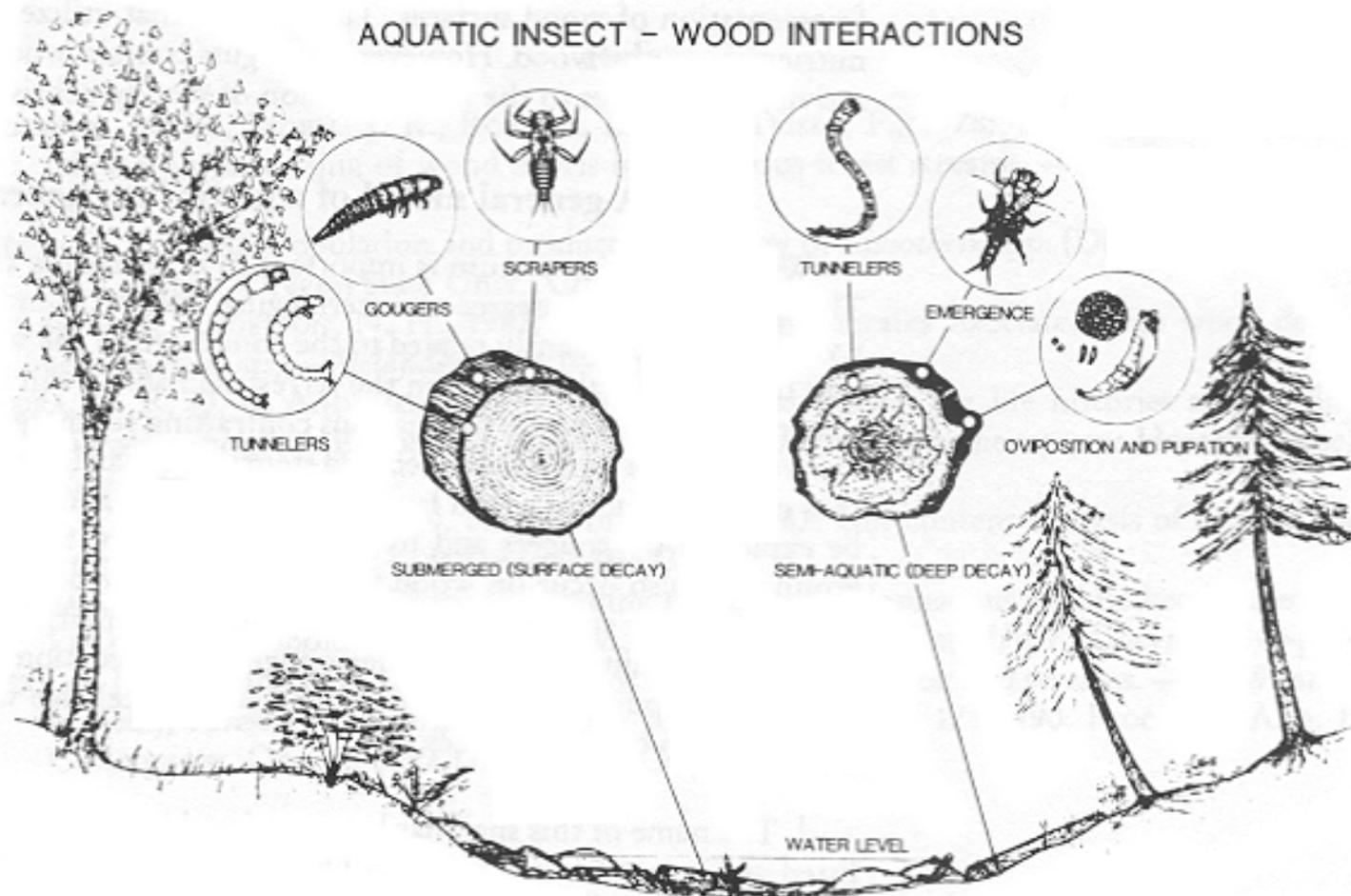


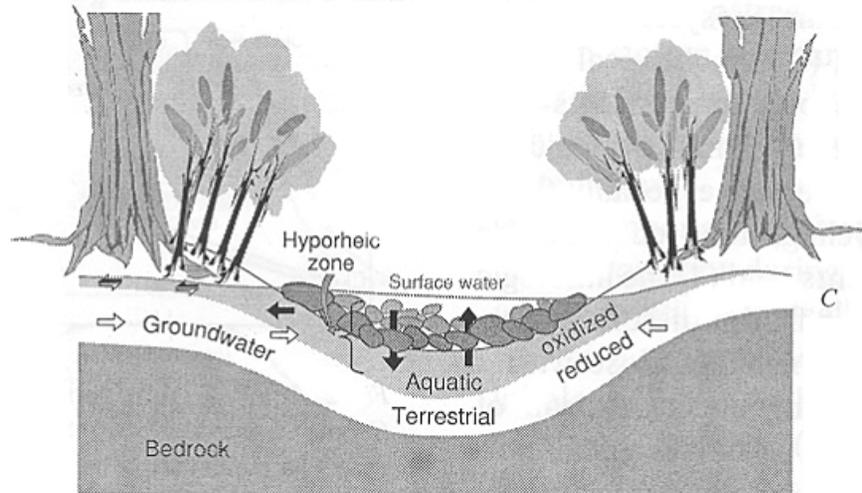
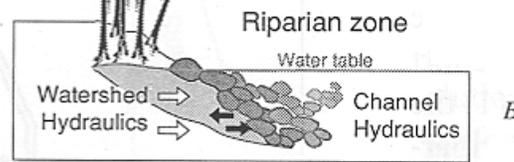
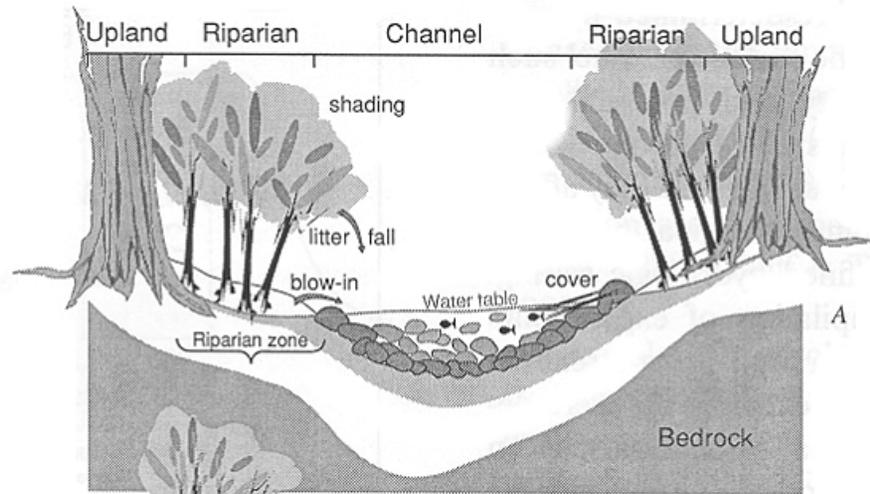
- Riparian zone is an ecotone
 - “boundary or transitional zone between adjacent biological communities”
- Used for nesting and feeding by variety of species
- Significant corridor for travel and migration by mammals and birds

Wildlife Habitat and Biodiversity

- Essential to Aquatic system functions
 - Riparian zone contributes 70-90% of food and energy to headwater streams
 - Large woody debris is important habitat for fish and aquatic insects

AQUATIC INSECT - WOOD INTERACTIONS





Flood Damage Reduction

- Riparian buffers may reduce damages from flooding by:
 - Storing water in soil, floodplains, and wetlands
 - Reducing peak flows of certain events
 - Protecting streambanks from erosion
 - Slowing flows in headwater streams

Recreation and Education



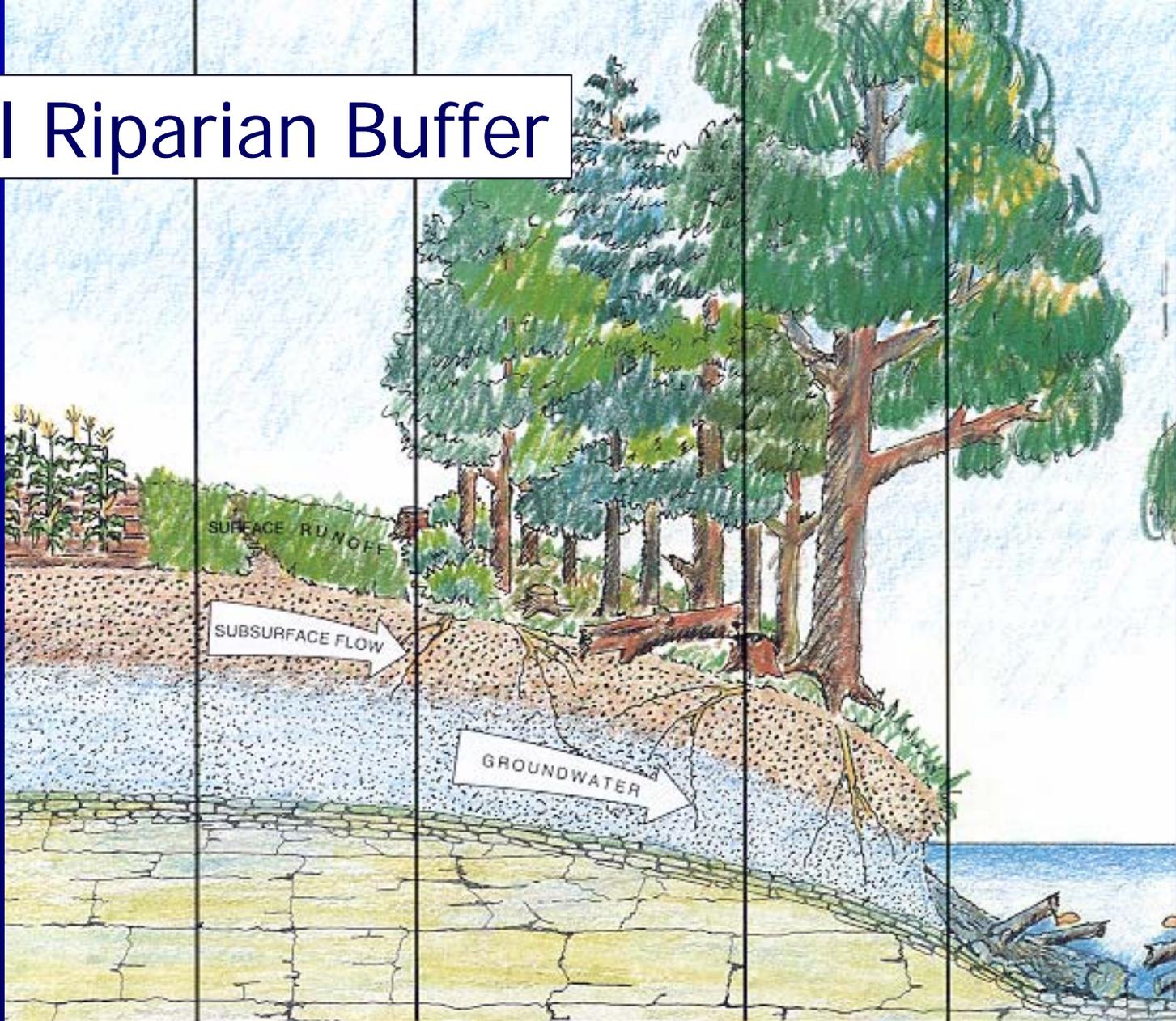
■ Outdoor Recreation

- Trail systems (Walk/Bike/Ski/Canoe)
- Bird watching
- Fishing/Hunting
- Camping

■ Educational Opportunities

- Outdoor classroom for local schools
- Natural interpretive areas

Ideal Riparian Buffer



Cropland

Runoff Control

Managed Forest

Undisturbed
Forest

Stream Channel

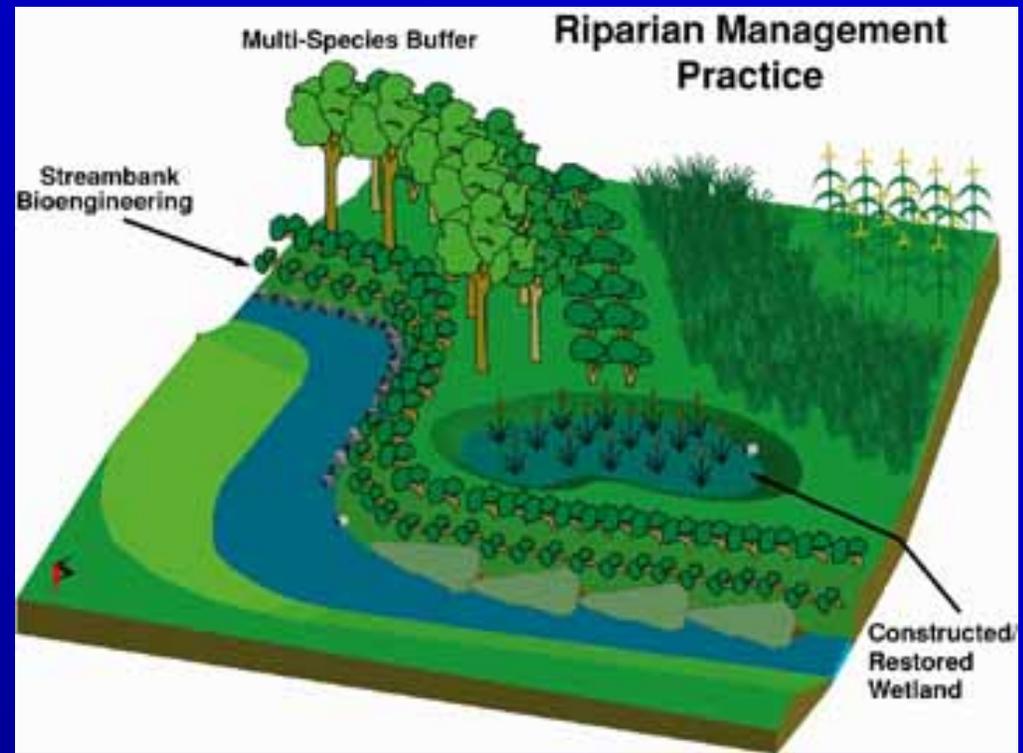
How do we have functioning Riparian Buffers?

Restoration

Protection

Management

Project Goals



- 1. Influence land management choices in the watersheds of the basin that improve forest condition, protect water resources and improve water quality.
- 2. Produce 300 plans representing 30,000 acres, outlining forest management practices aligned with North Dakota Forest Best Management Practices.

Project Goals

- 3. Restore 100 river miles.
- 4. Establish eight BMP demonstration sites.



Project Goals



- 5. Coordinate delivery of multiple programs involving riparian management by combining efforts of the project sponsors and contributing agencies.
- 6. Provide direct assistance to landowners and communities.
- 7. Increase the awareness and expertise of resource managers, policy makers and landowners.

Project Organization

Sponsors:



Red River
RC&D

Subcontractors:



Geology
Department



Project Organization

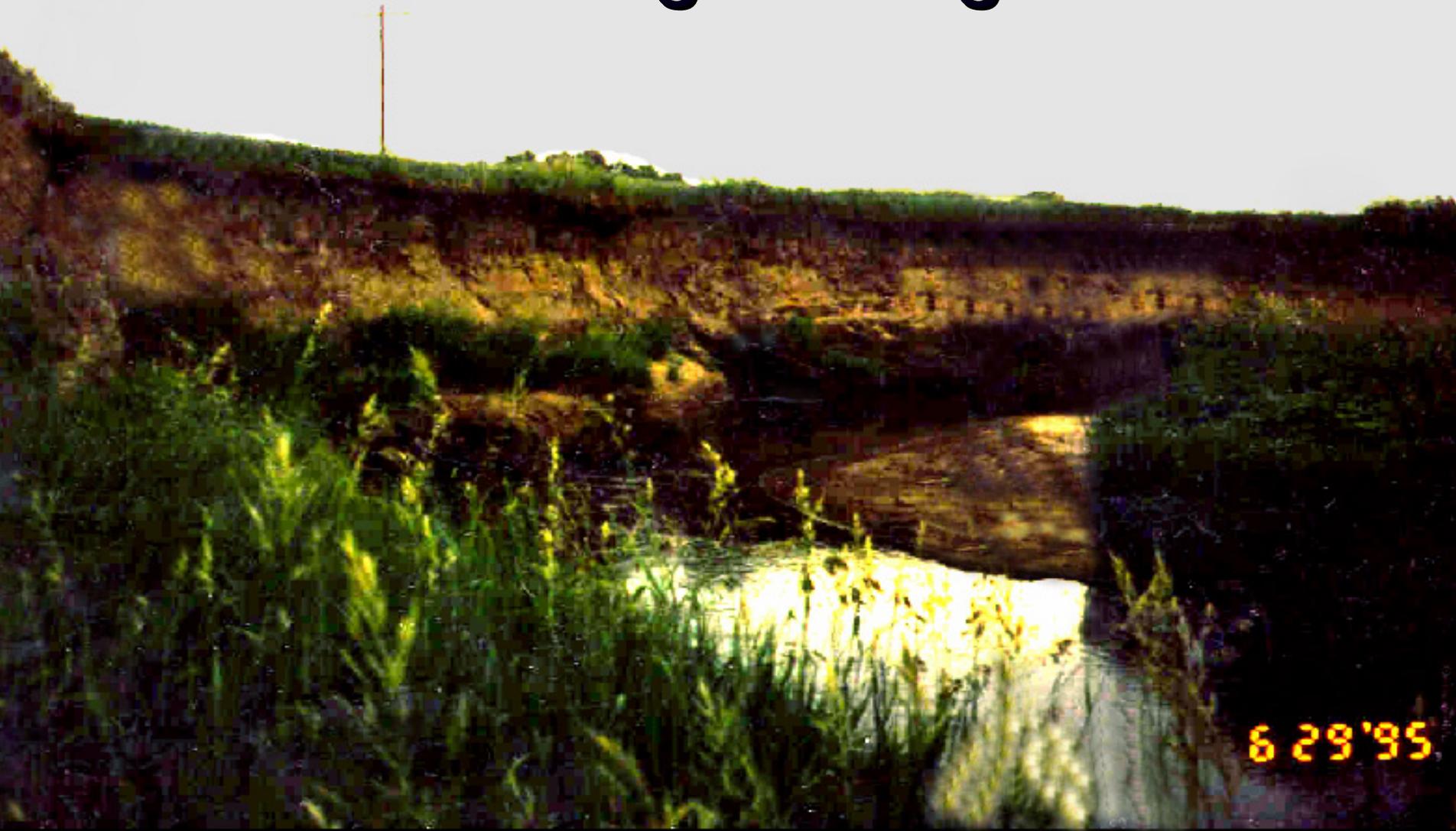
- Advisory Committee:
 - Local landowners



North Dakota
Game & Fish



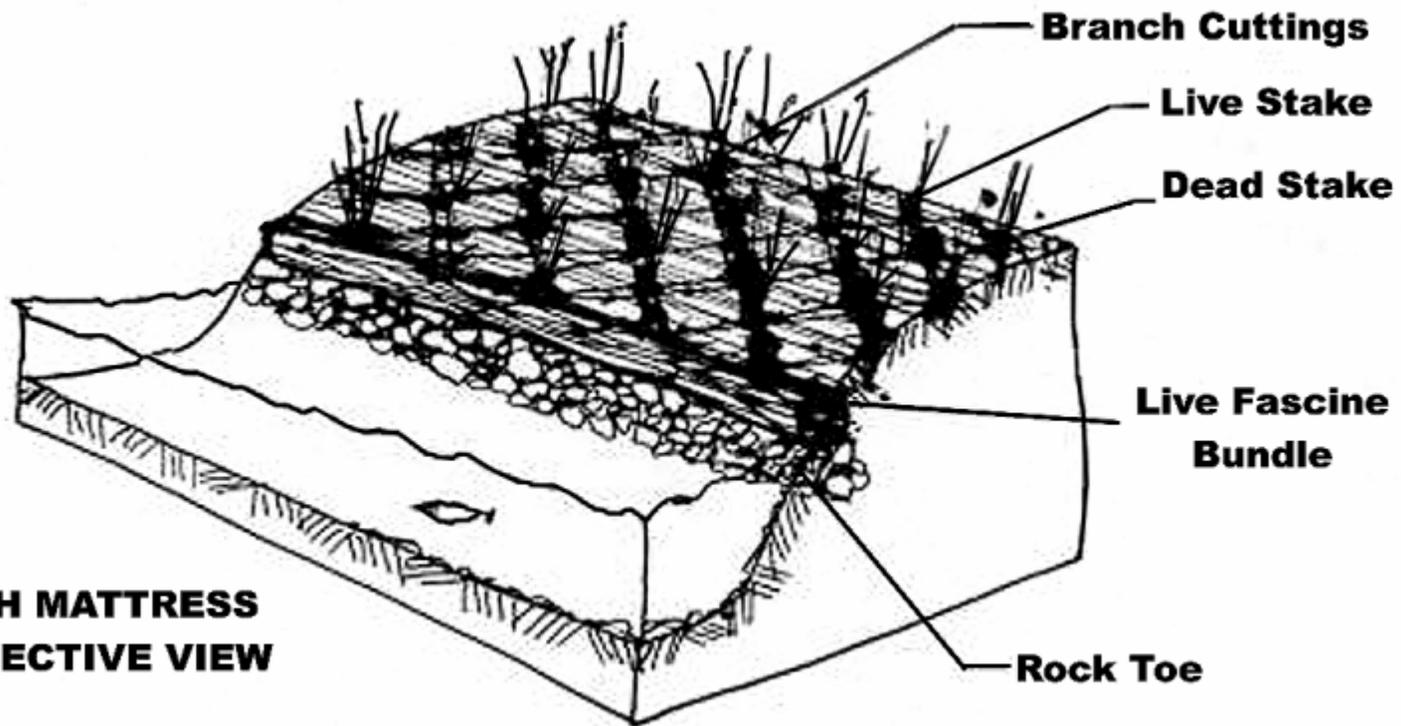
Turtle River Soil Bioengineering Site



6 29 '95

Installing fascine and brush mattress





**BRUSH MATTRESS
PERSPECTIVE VIEW**

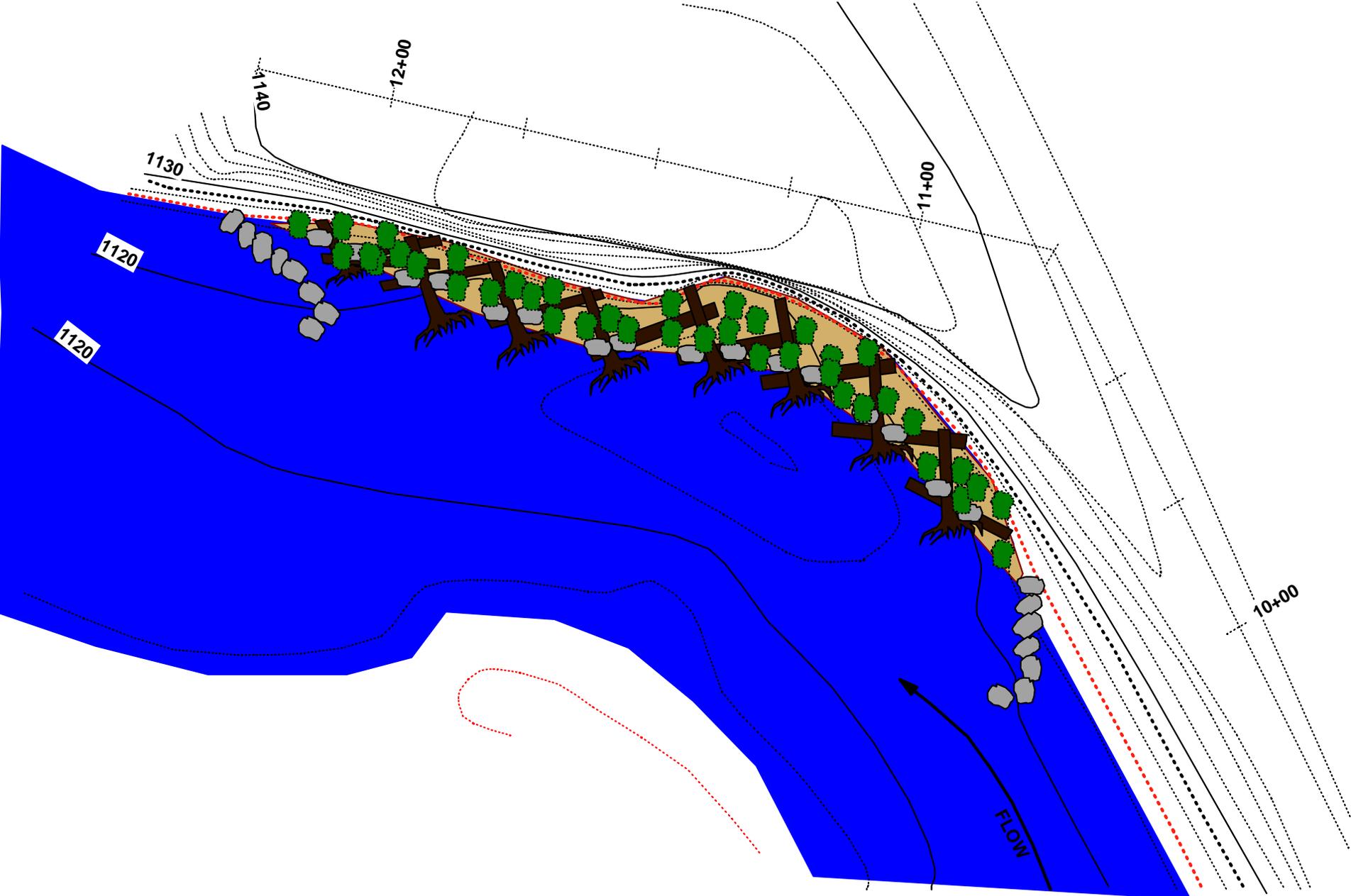
Brush mattress and facine
after installation.



Turtle River Site: August 2000

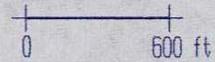


INTERSTATE BANK STABILIZATION PROJECT

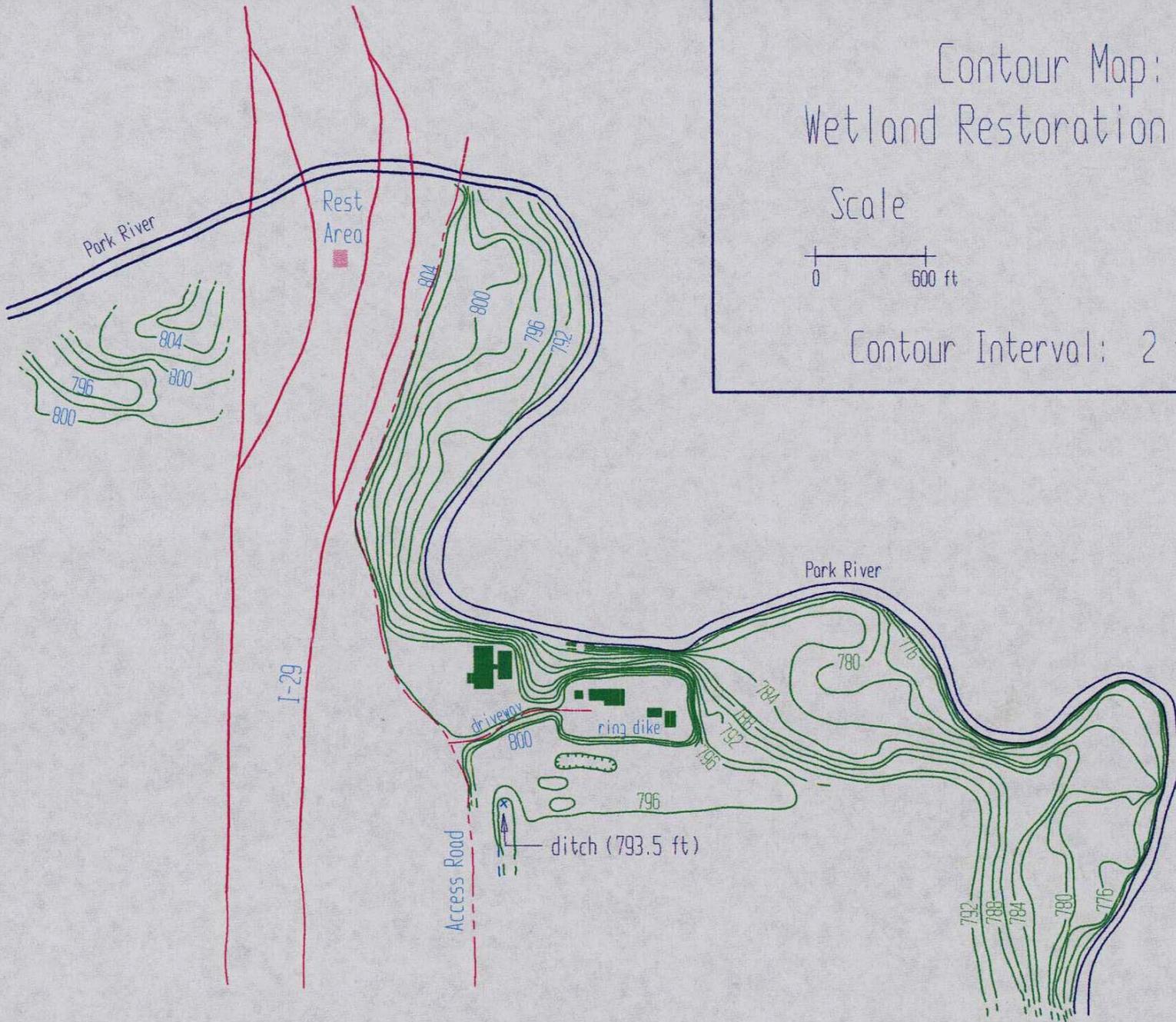


Contour Map: Wetland Restoration Sites

Scale



Contour Interval: 2 feet

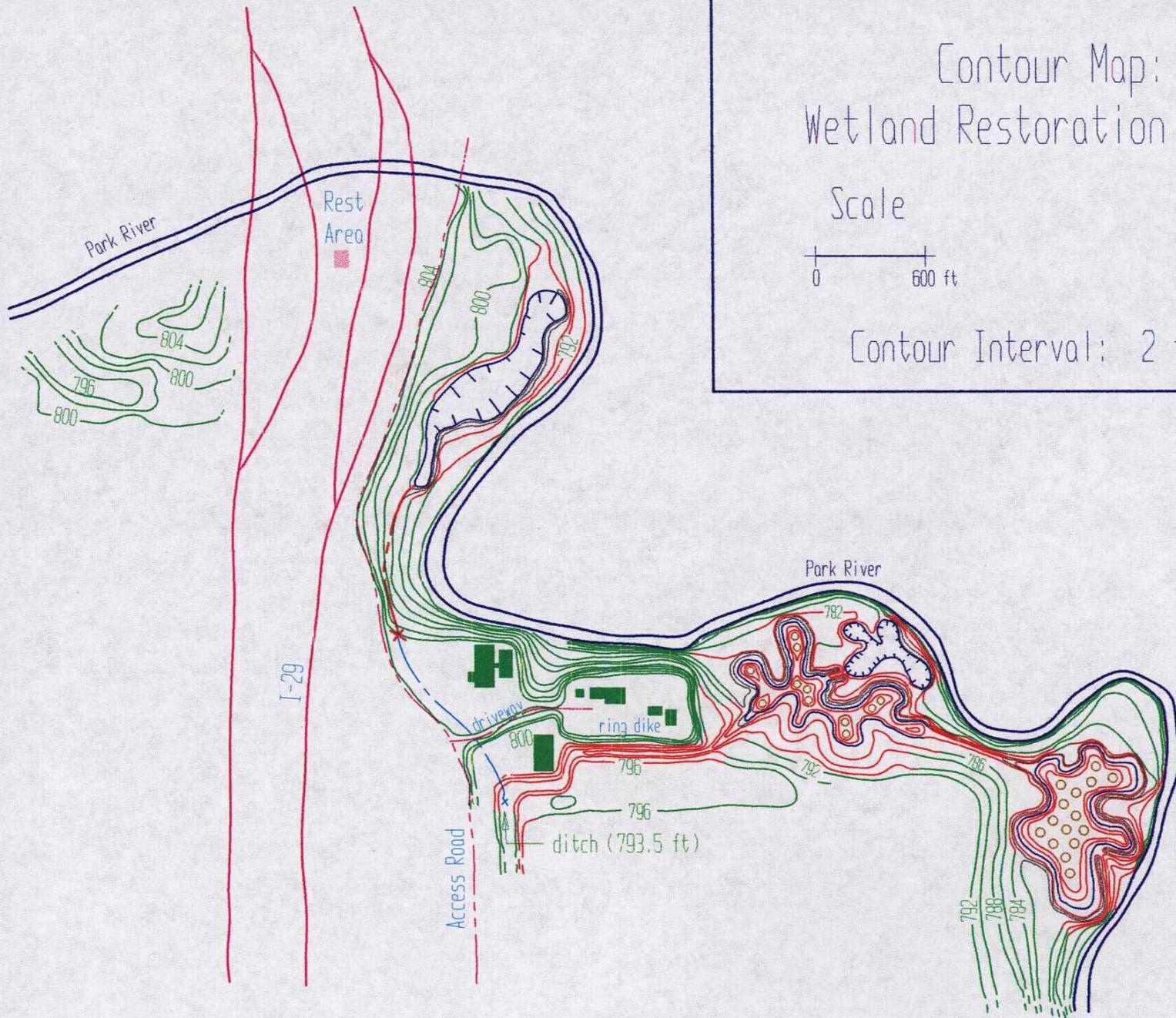


Contour Map: Wetland Restoration Sites

Scale



Contour Interval: 2 feet



Grand Forks Country Club



After Reshaping and Installing Rocks/Root Wads

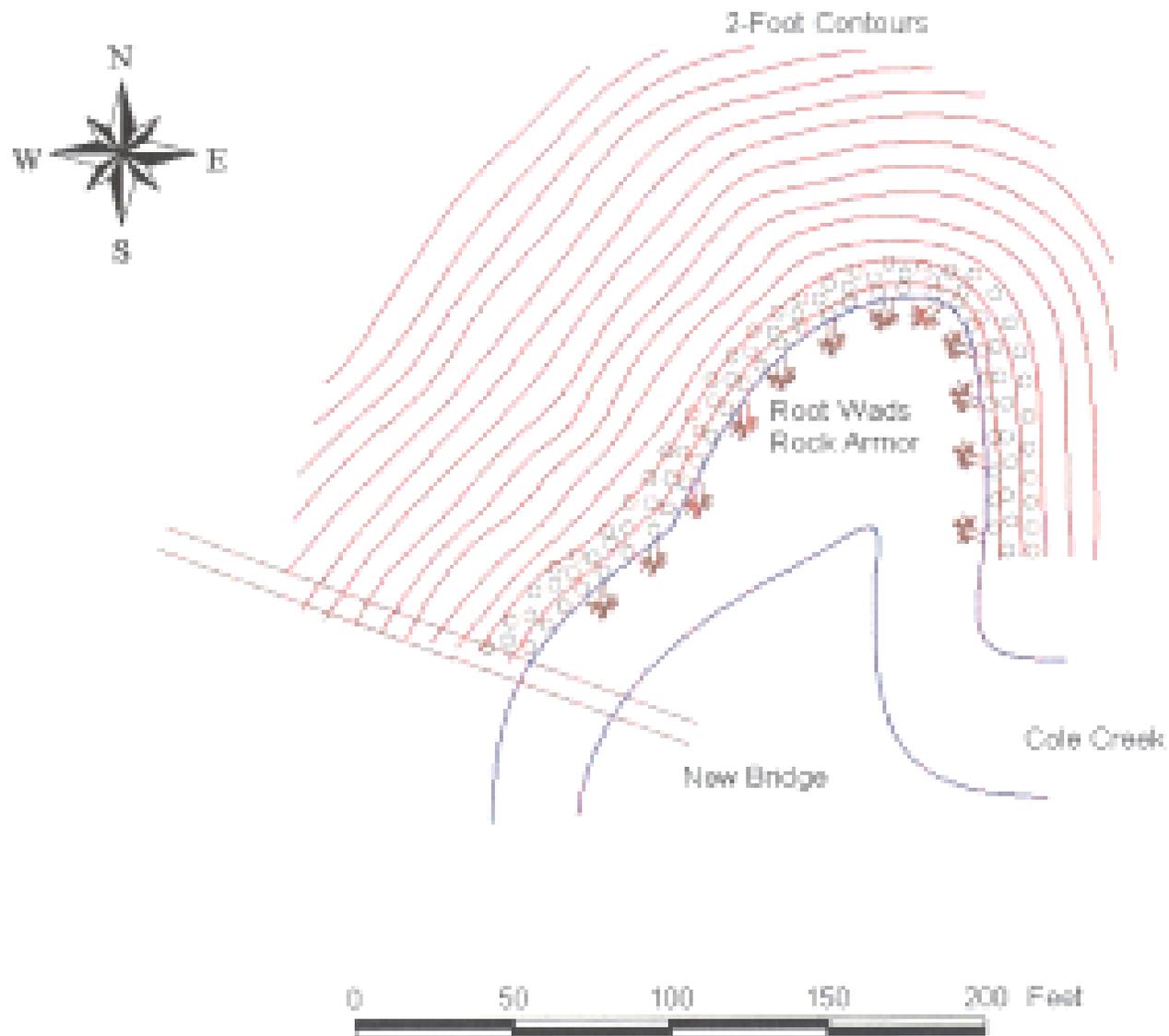


Figure 4

RRRP Involvement in GF/EGF Greenway

Riparian forest area

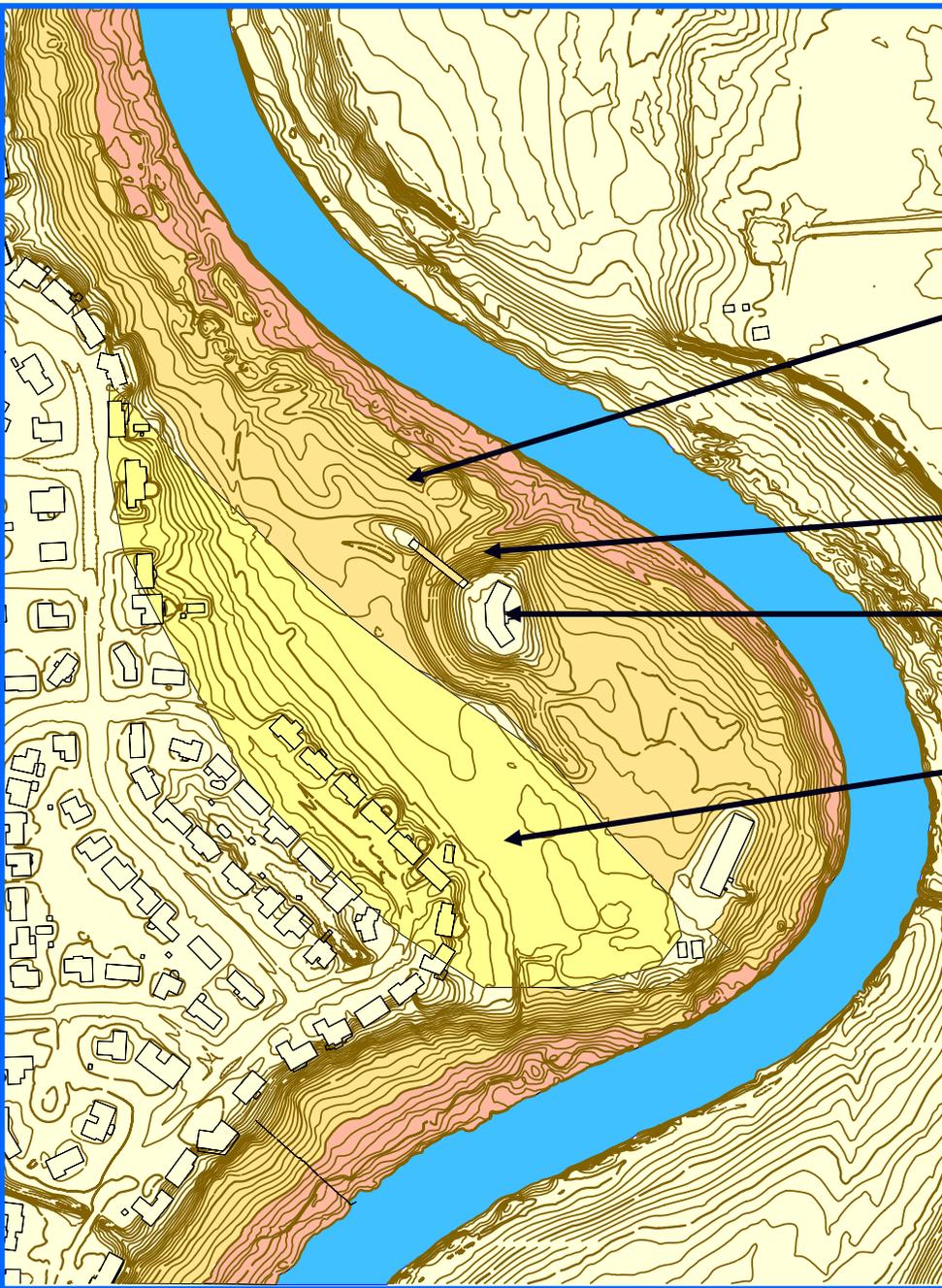
- Area below 823'

Wetland planting

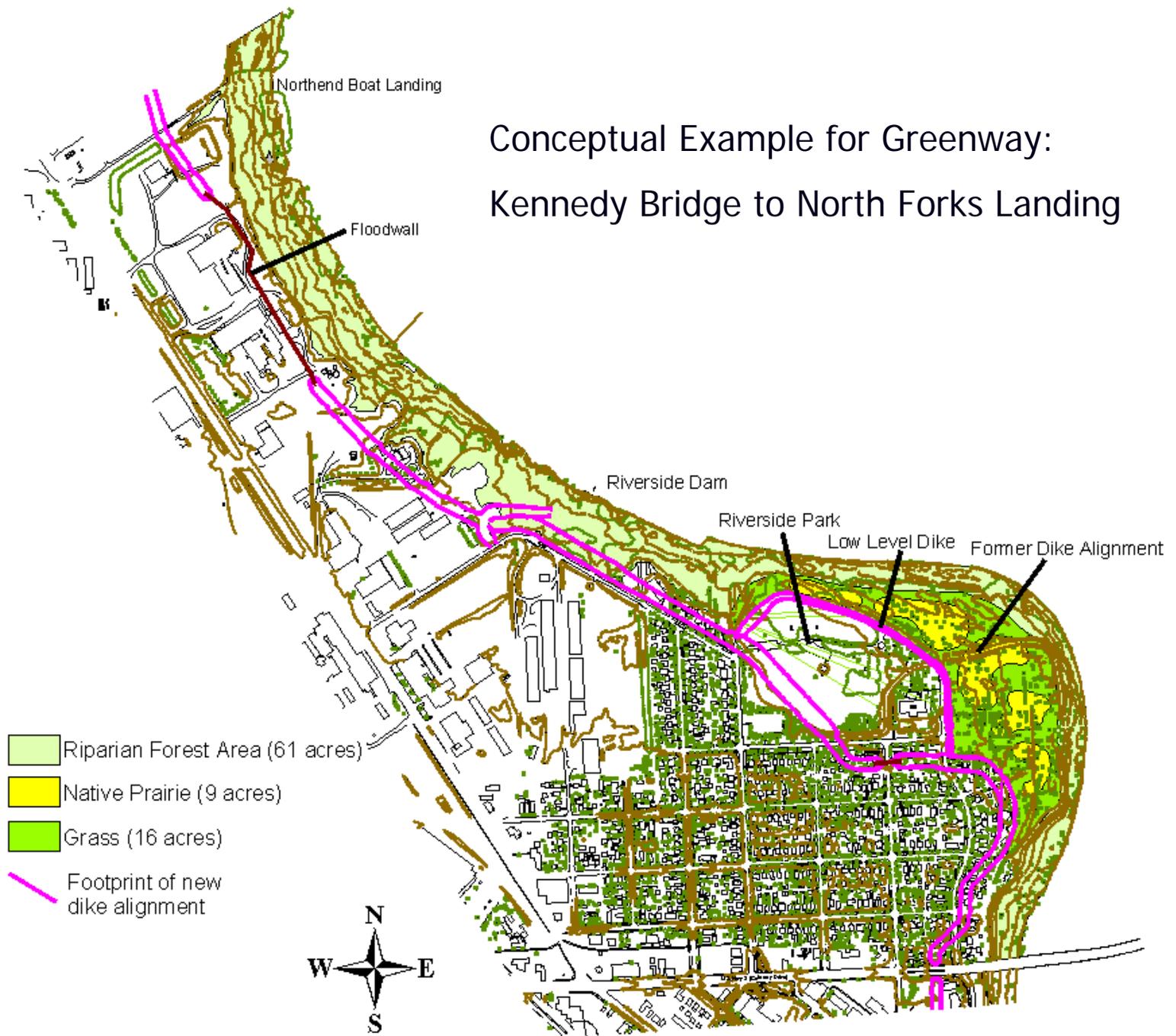
Scenic overlook

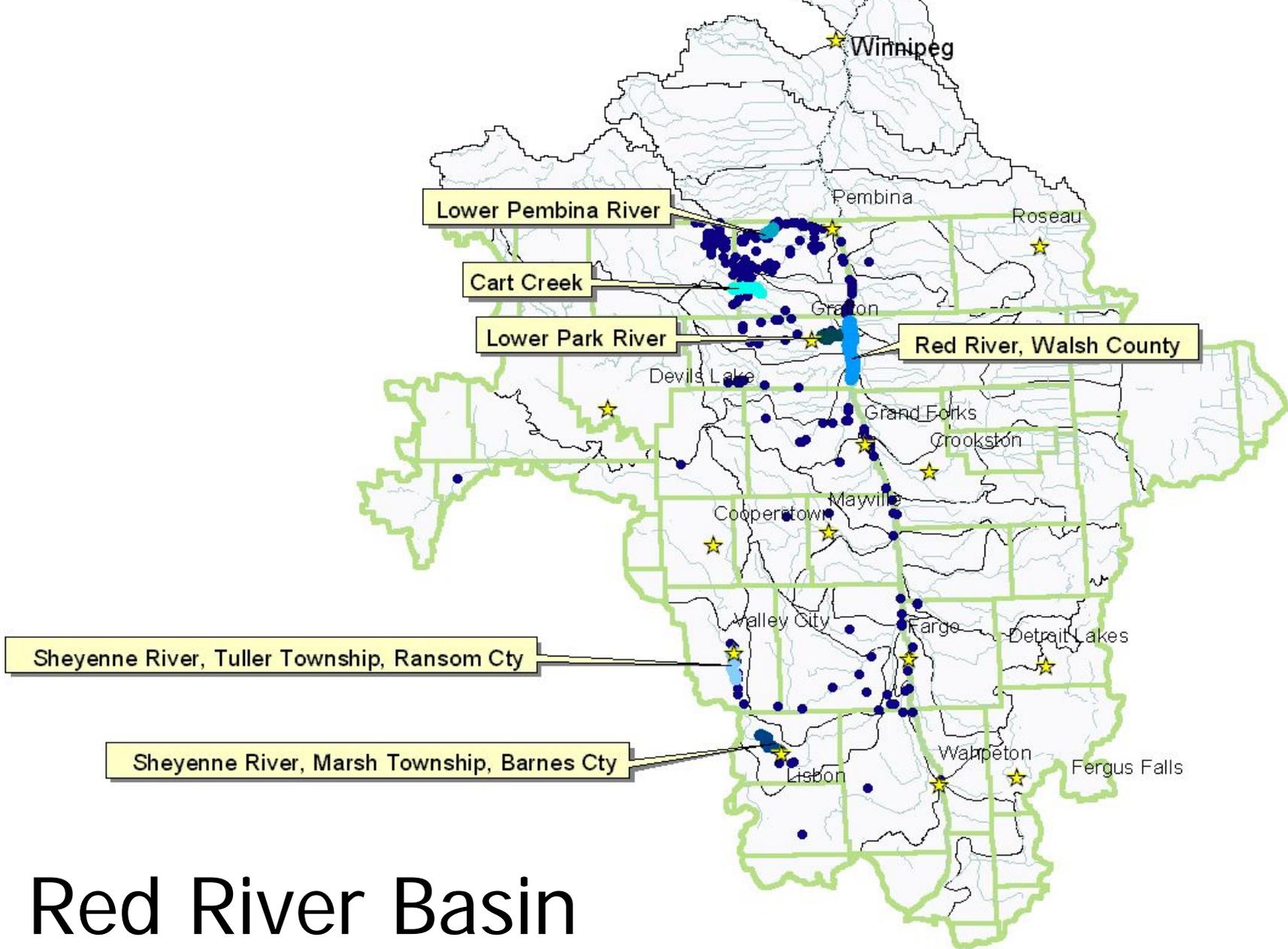
Native wildflower
prairie (14 acres)

**Conceptual
Example for
Koinonia Property**



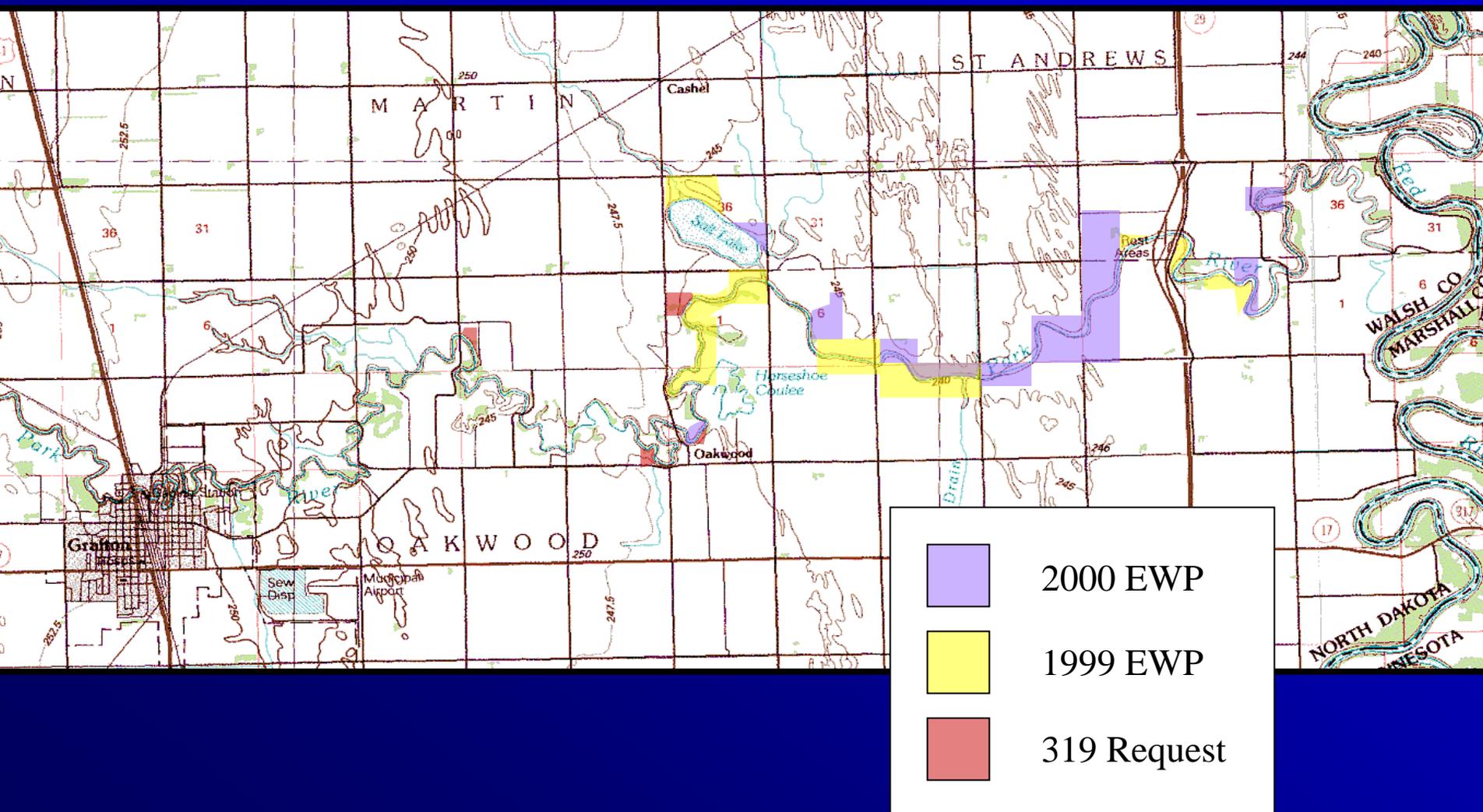
Conceptual Example for Greenway: Kennedy Bridge to North Forks Landing



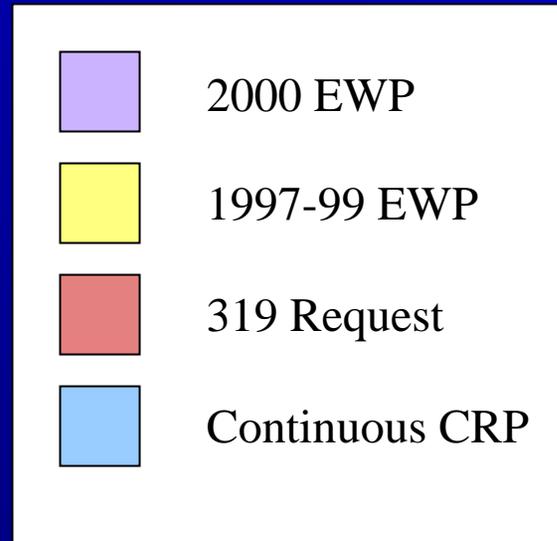
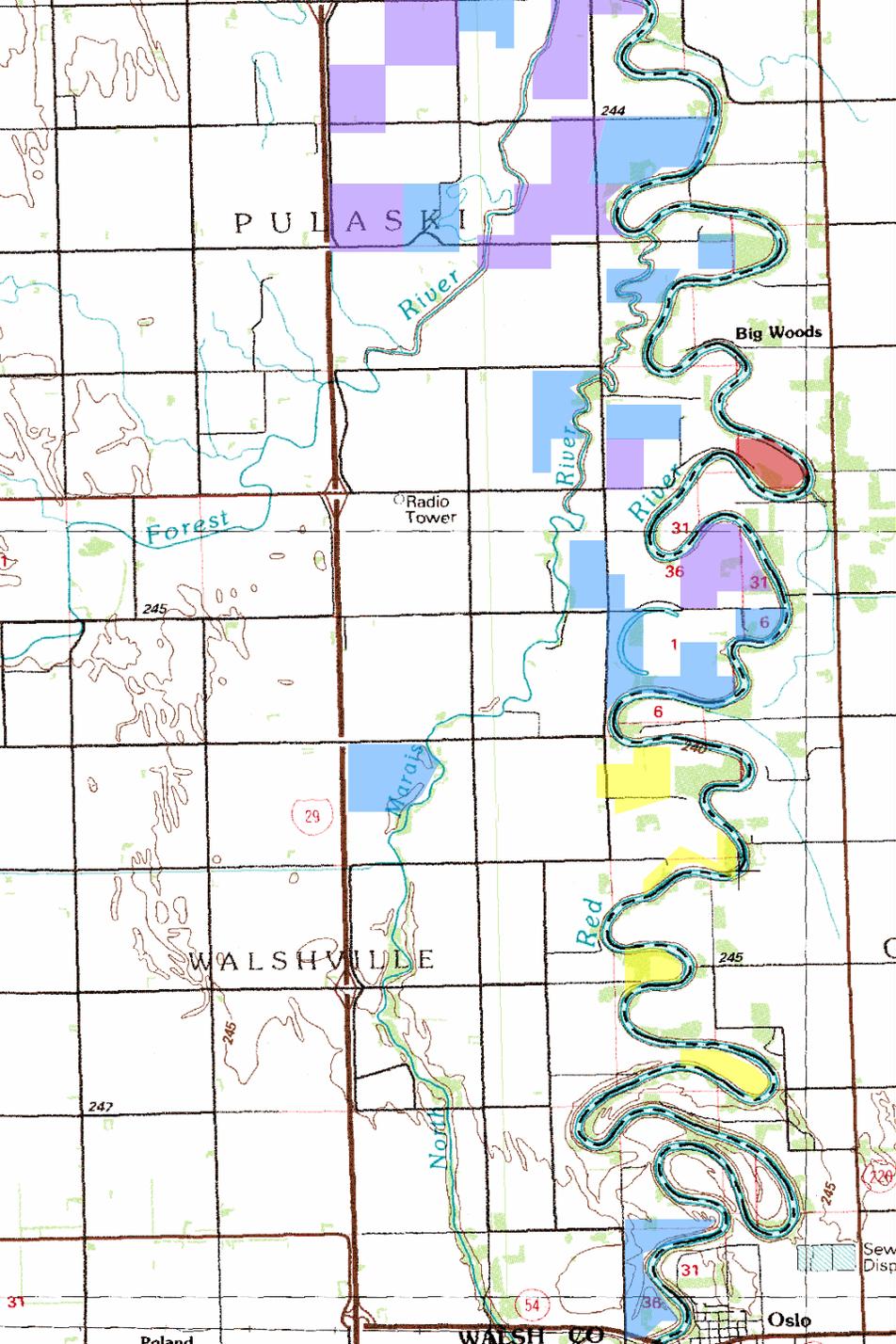


Red River Basin Priority Reaches

Lower Park River Reach



Protection efforts along the Red River Walshville and Pulaski Twps.



Reach Restoration Objectives



- Re-establish riparian forests.
- Manage existing riparian forests in a healthy condition for water quality and habitat benefits.

Red River Basin Riparian Project Informational Products

- Website

www.health.state.nd.us/RRBRP

- Reports

- ND Forestry BMP manual

- Workshops and training

- Site maps and photos

