

The Nature
Conservancy

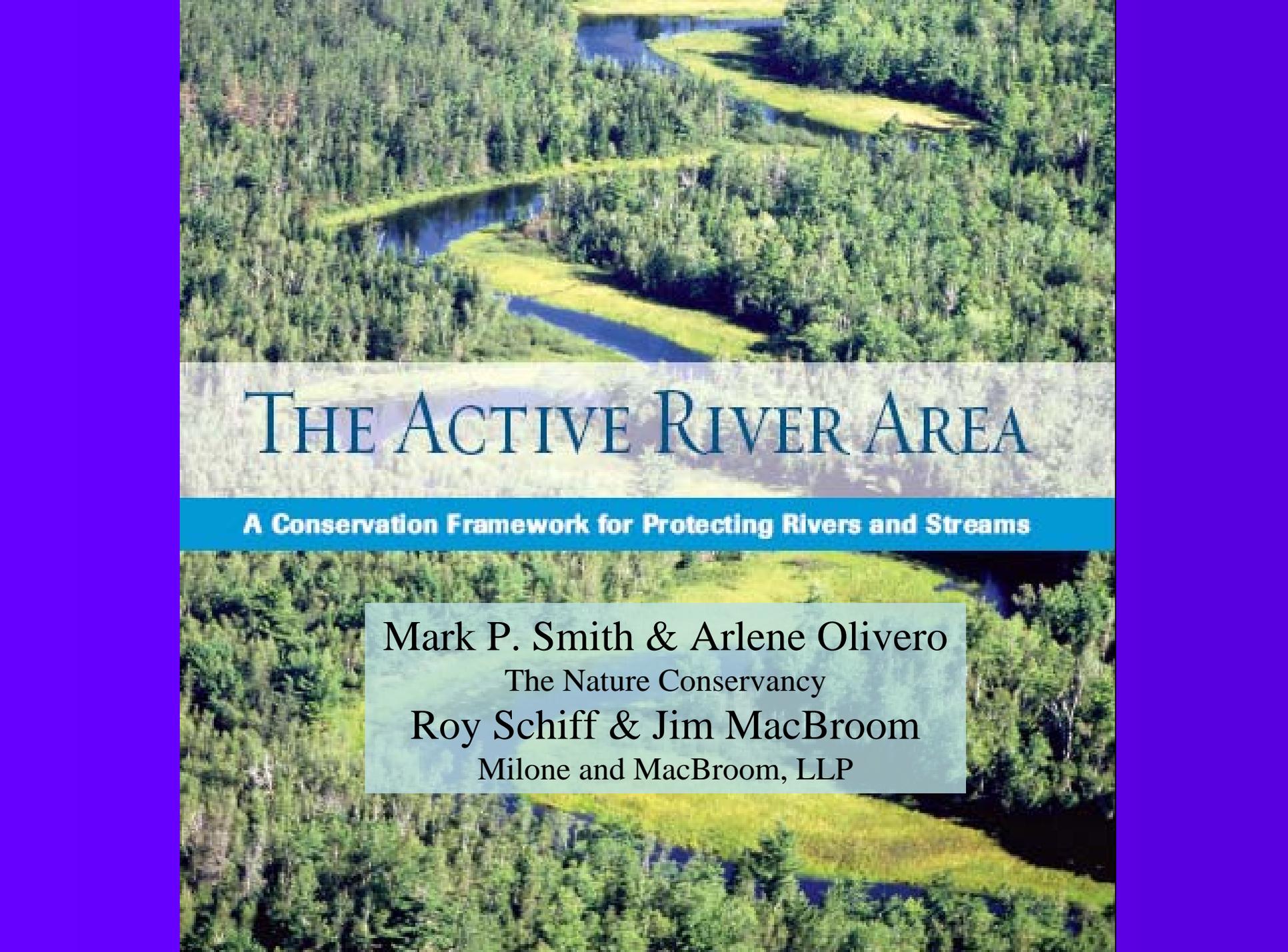


Protecting nature. Preserving life.™

The Active River Area A Conservation Framework for Protecting Rivers and Streams

Water / Watershed Conference
Concord, NH
November 20-21, 2009

Mad River Swamp, Tug Hill, NY

An aerial photograph of a river meandering through a lush, green forest. The river is a vibrant blue, contrasting with the surrounding greenery. The banks are covered in dense trees and vegetation. The overall scene is a natural, undisturbed landscape.

THE ACTIVE RIVER AREA

A Conservation Framework for Protecting Rivers and Streams

Mark P. Smith & Arlene Olivero

The Nature Conservancy

Roy Schiff & Jim MacBroom

Milone and MacBroom, LLP



River and Stream Protection and Restoration

**Look at places through the lens of
processes**

- **Ecological Processes**
- **Physical Processes**

**Build a framework useful at the
regional, watershed and reach
scales.**

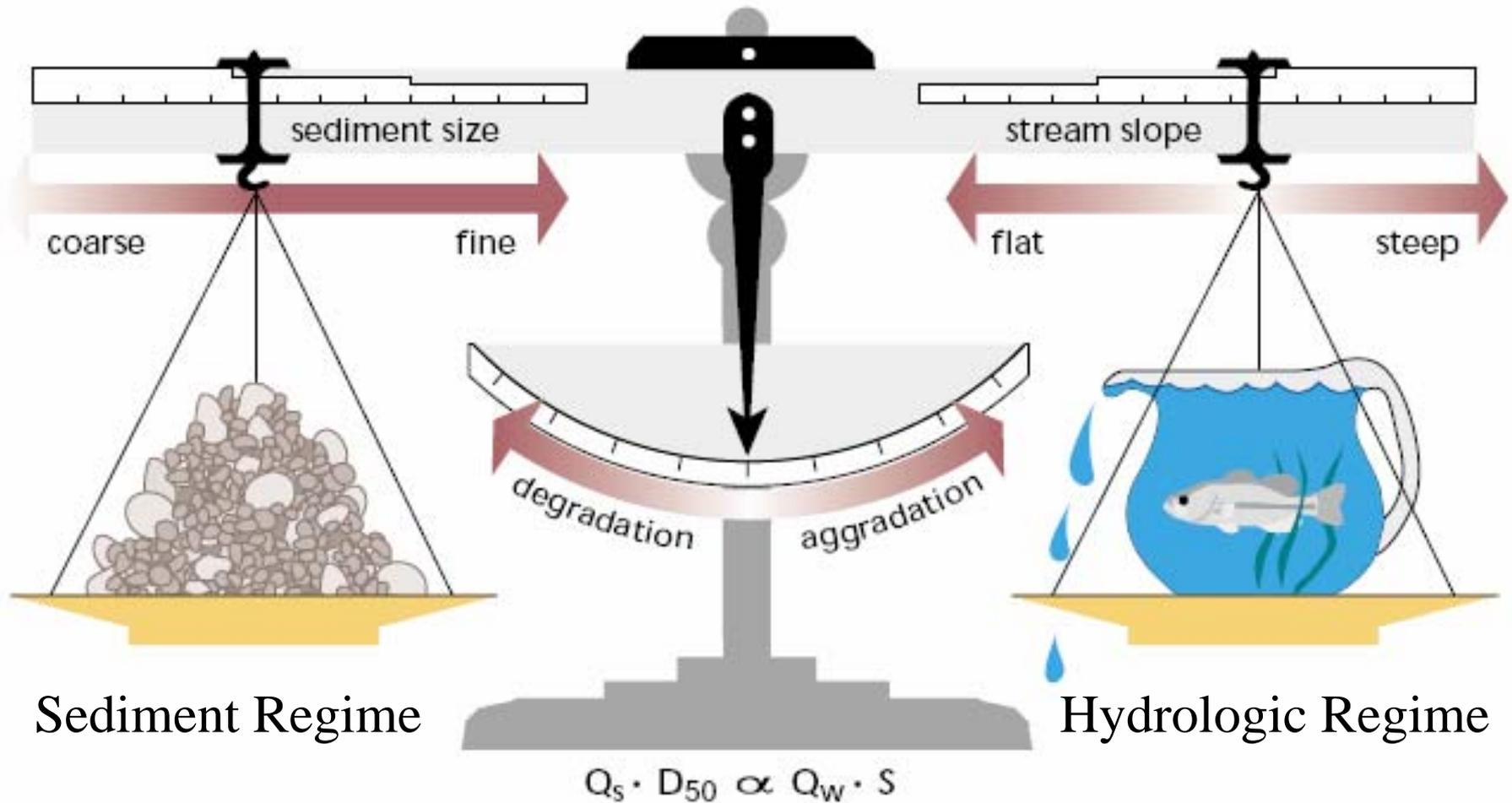


Ecosystem Services

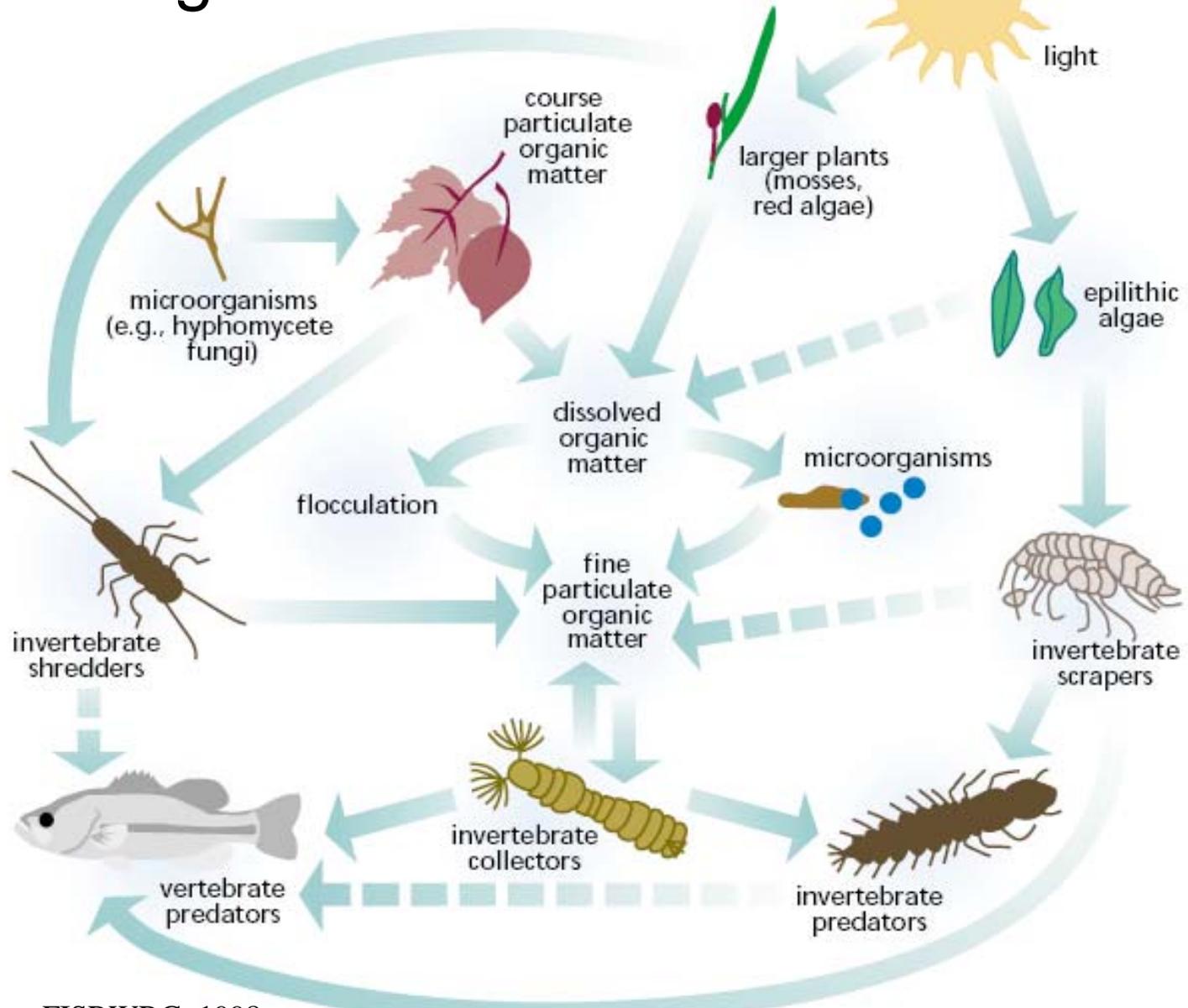
- **Hazard Mitigation and Avoidance**
- **Biodiversity Conservation**
- **Water Quality Protection**
- **Recreation**
- **Other Habitat Values**
 - **Edge Habitat Species & Communities**
 - **Movement Corridors**
 - **Scour Habitats**



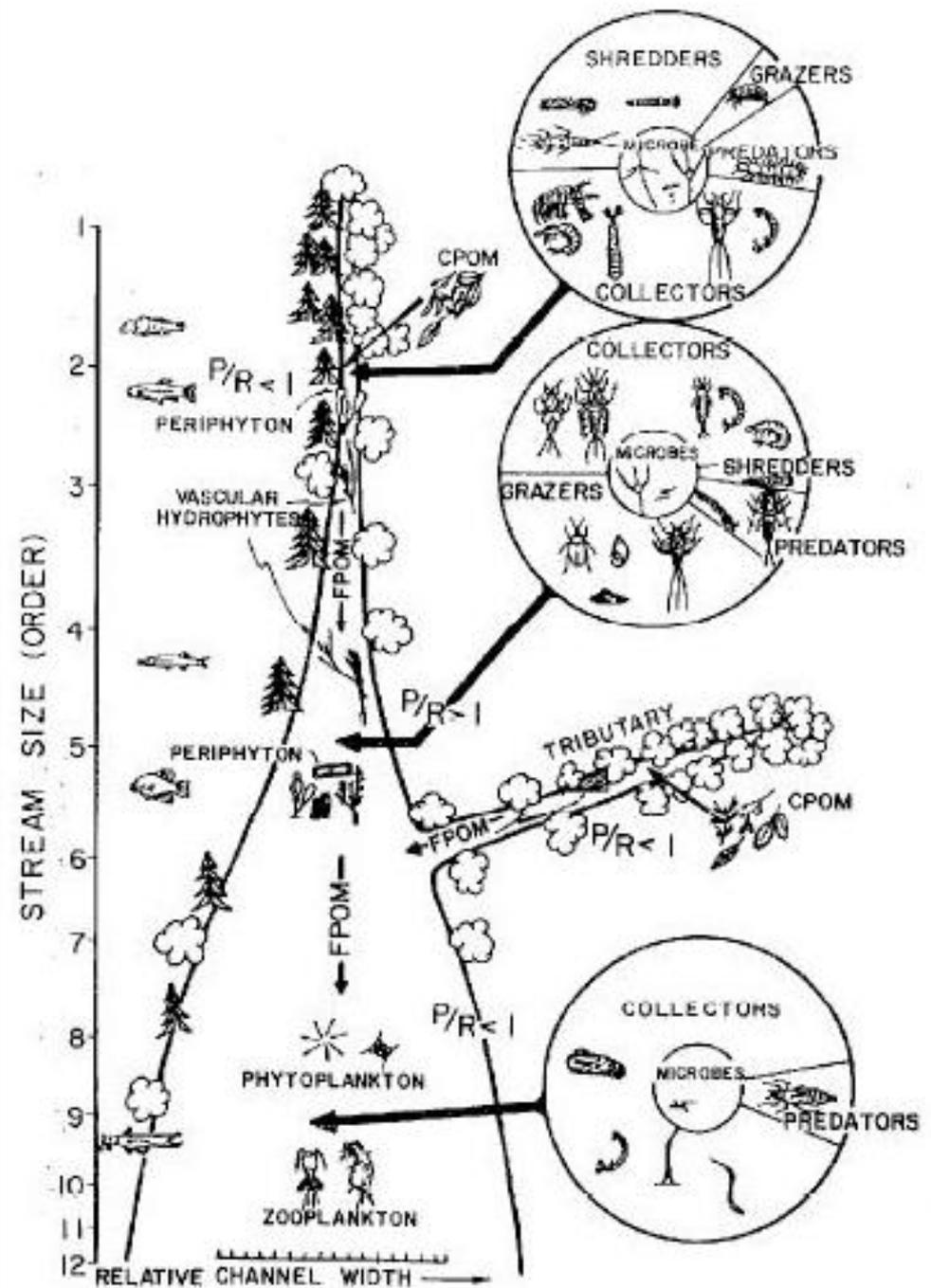
Physical Processes



Ecological Processes

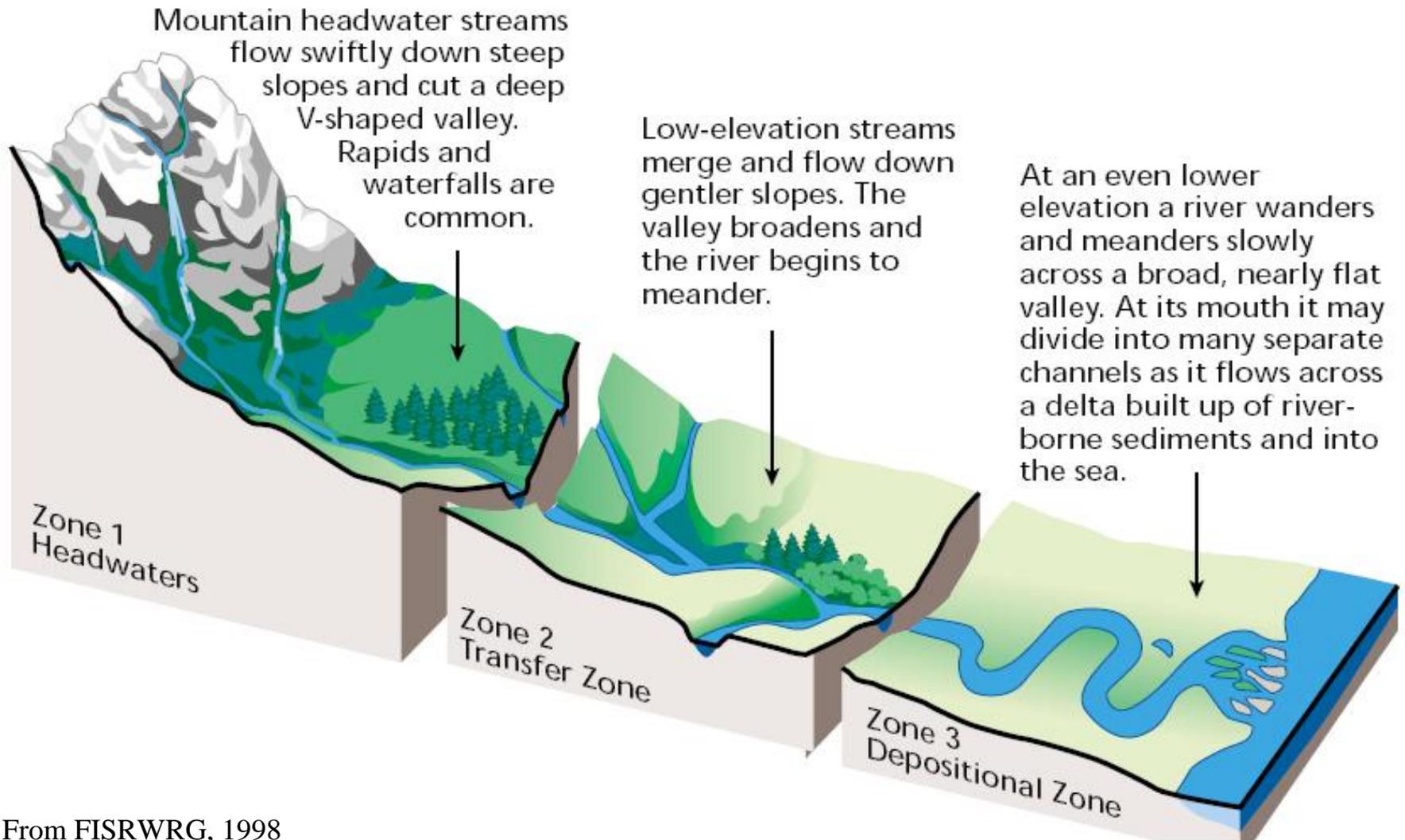


The River Continuum Concept



From Vannote et al., 1980

Watershed Position



Defining the 'active' river area

Where do these processes occur?

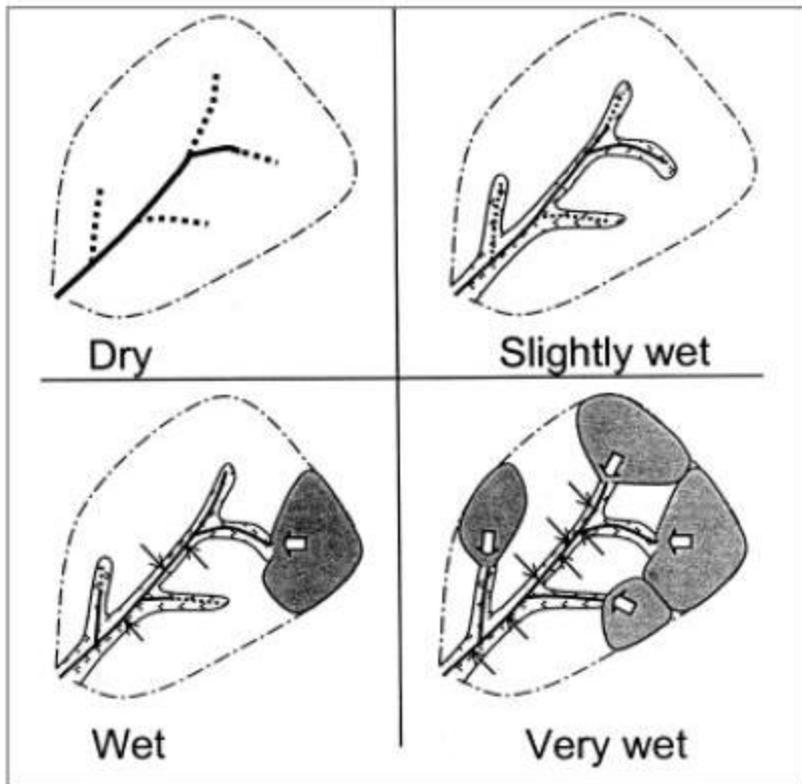


Active River Area Components

- 1. Material Contribution Areas**
- 2. Meander Belt**
- 3. Floodplains**
- 4. Terraces**
- 5. Riparian Wetlands**



1. Material Contribution Areas



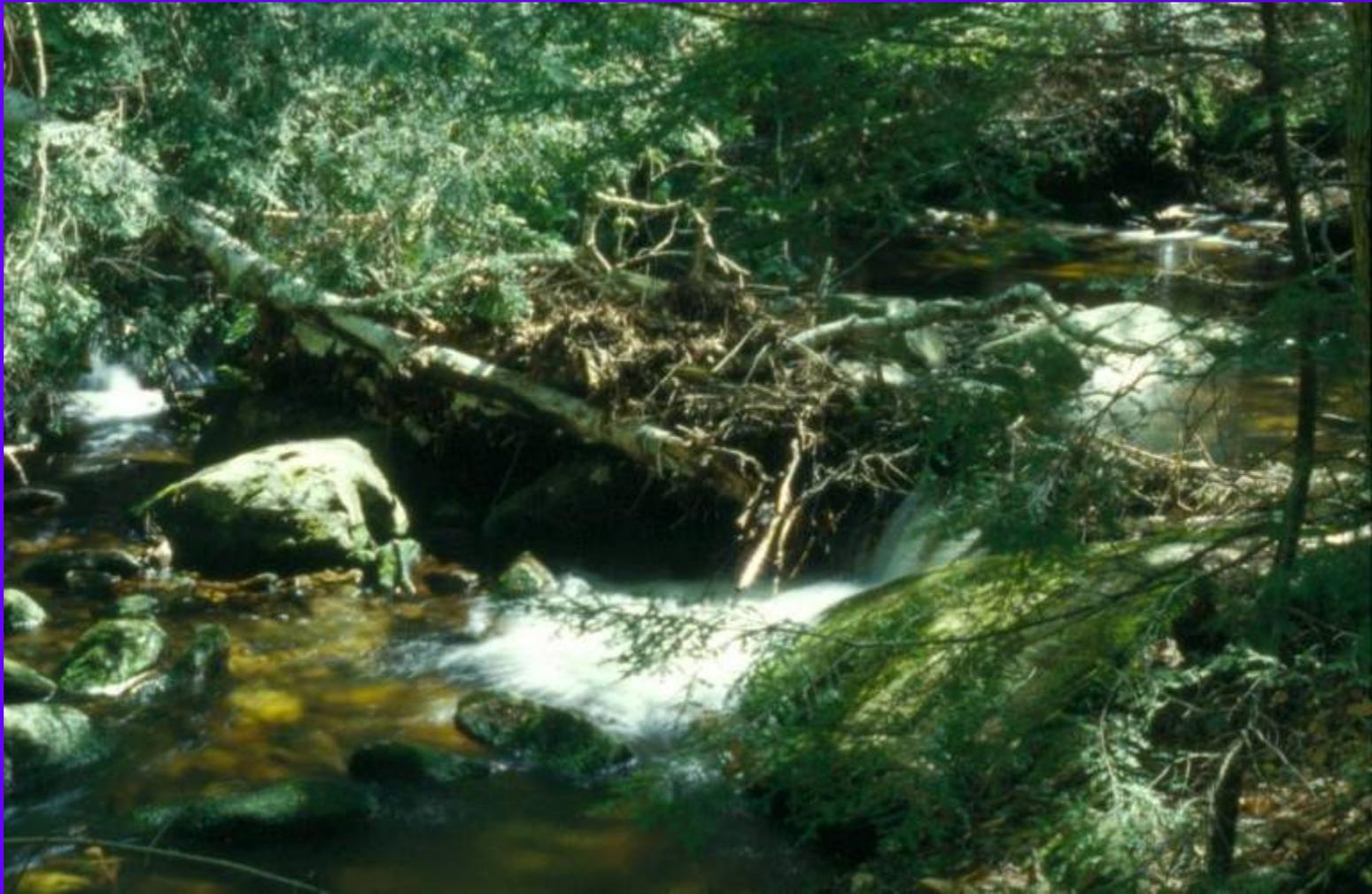
+



Bluffs, Slopes and
Adjacent Uplands

Small Headwater Watersheds

Organic and Inorganic Material + Large Woody Debris



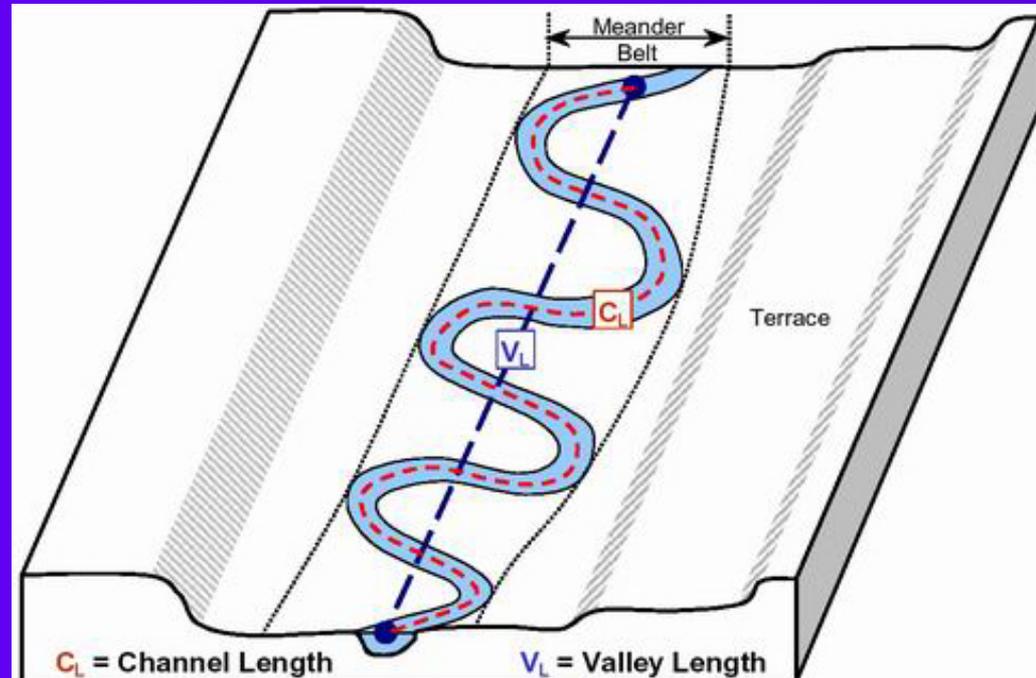


2. Meander Belts

From: Natural Resources of Canada

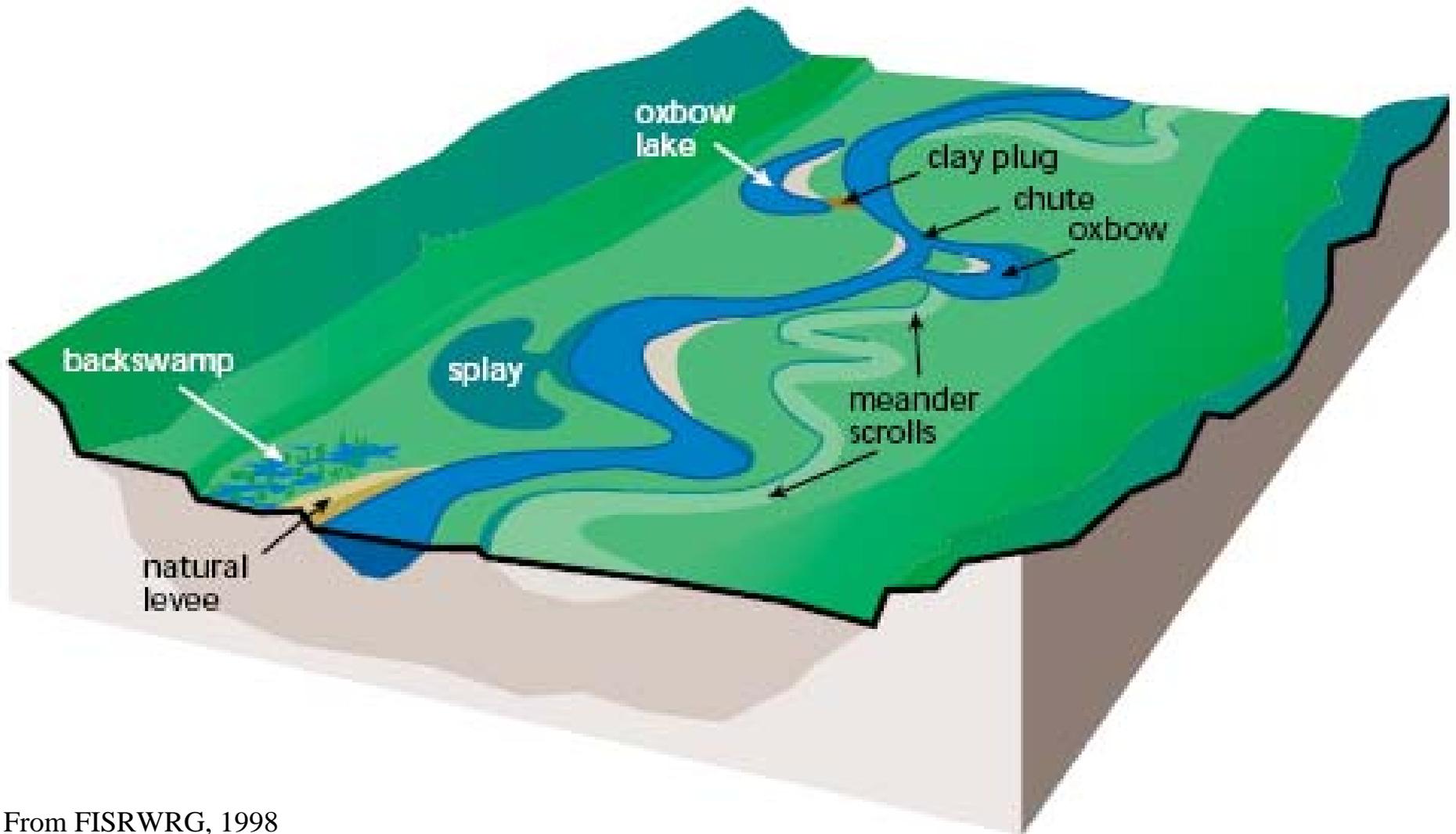
From: City of Austin

Channel location changes over time within this 'footprint'



Can be predictably measured

3. Floodplains



Floodplains

Highly Productive Riparian Habitat Areas

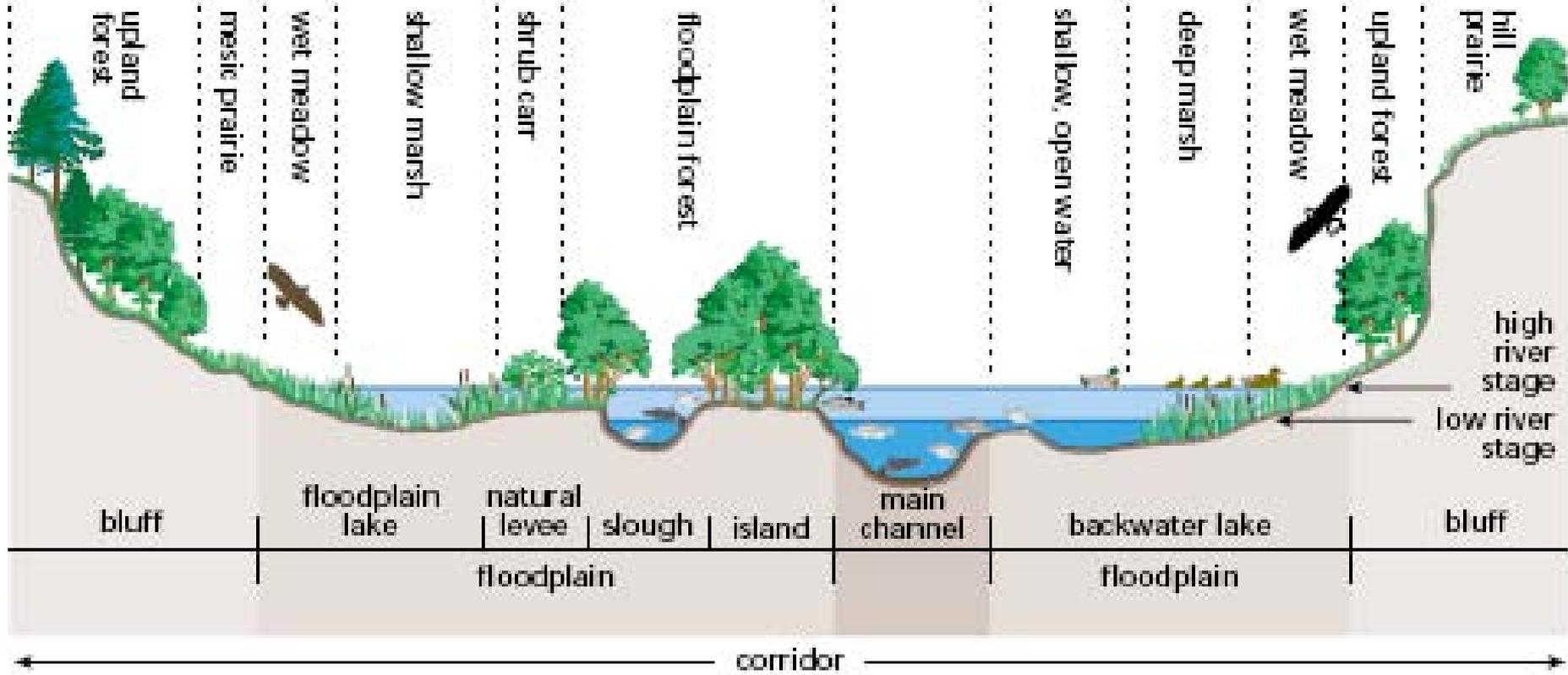


4. Terraces



New River, VA

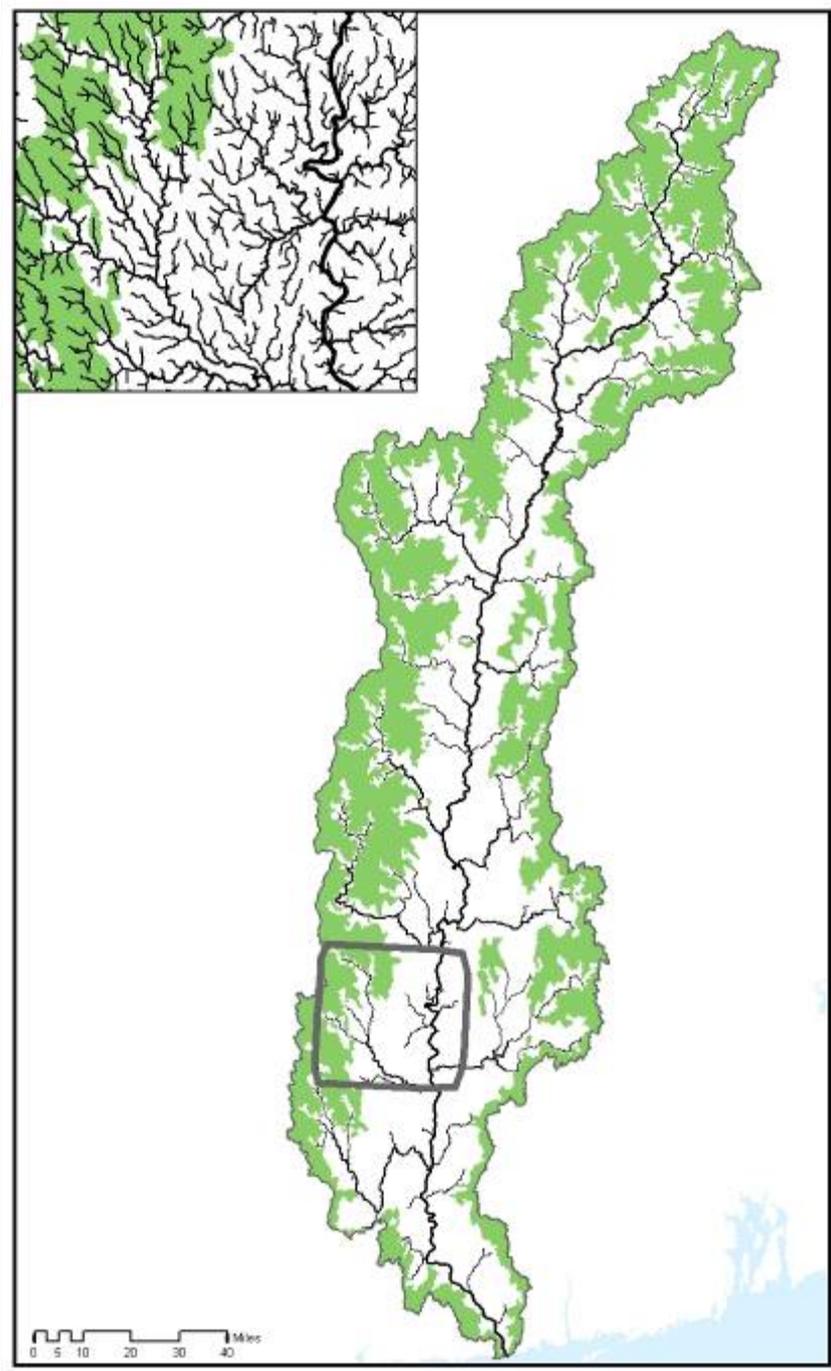
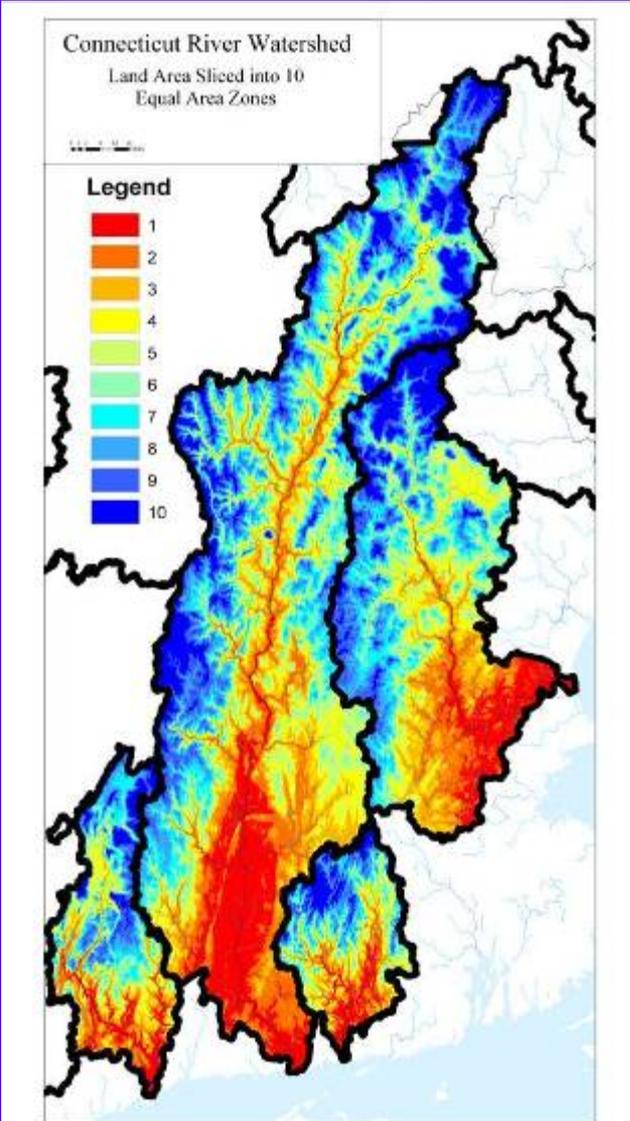
5. Riparian Wetlands



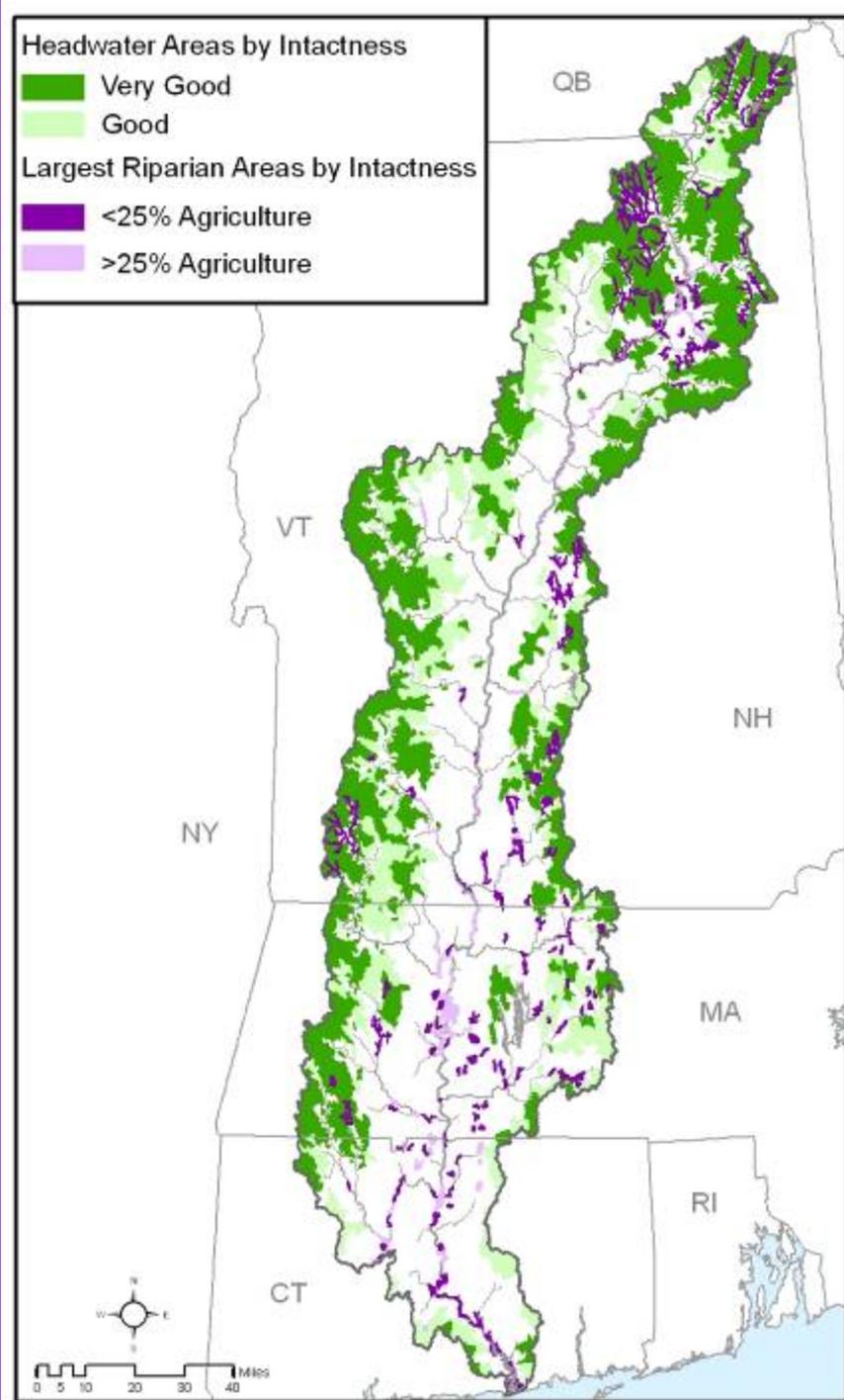


Tools for Mapping the Active River Area

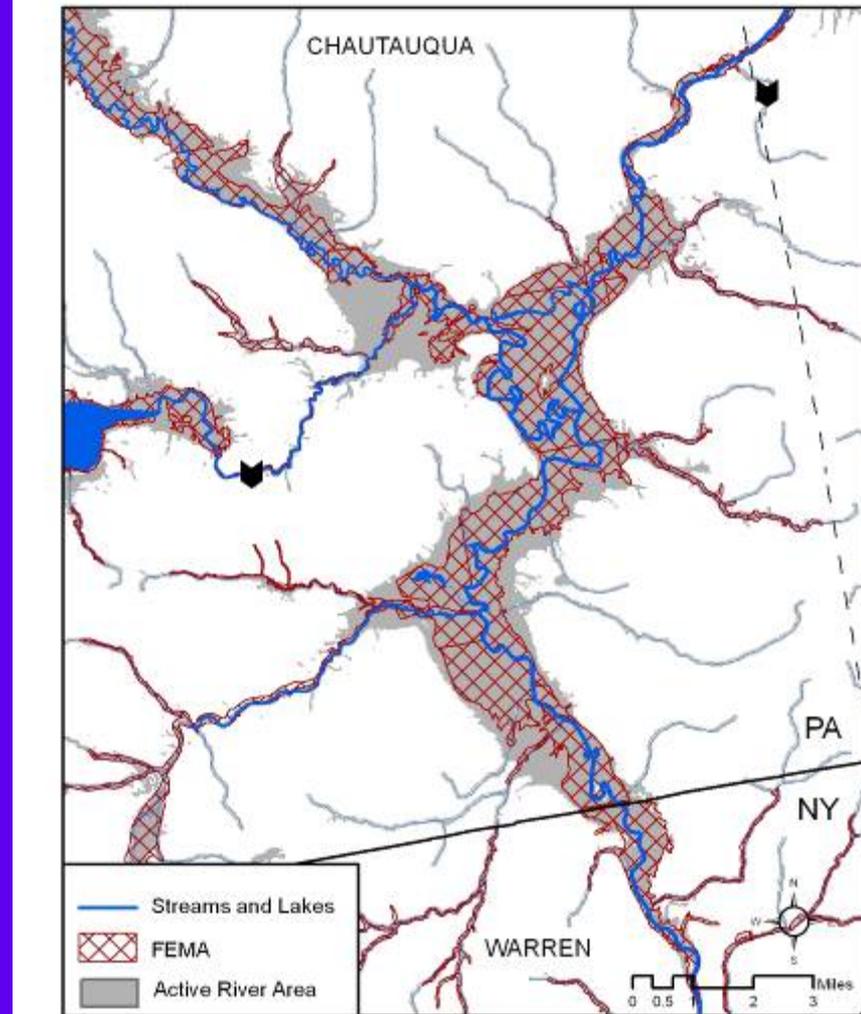
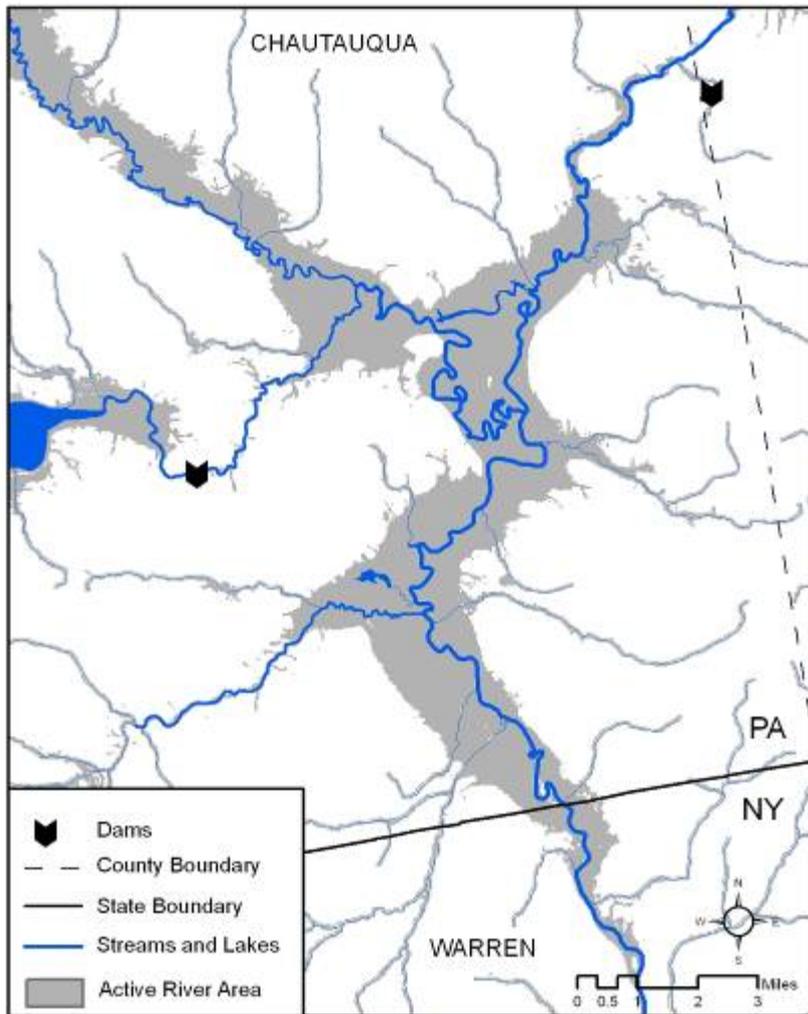
Part 1: Material Contribution Headwater Areas



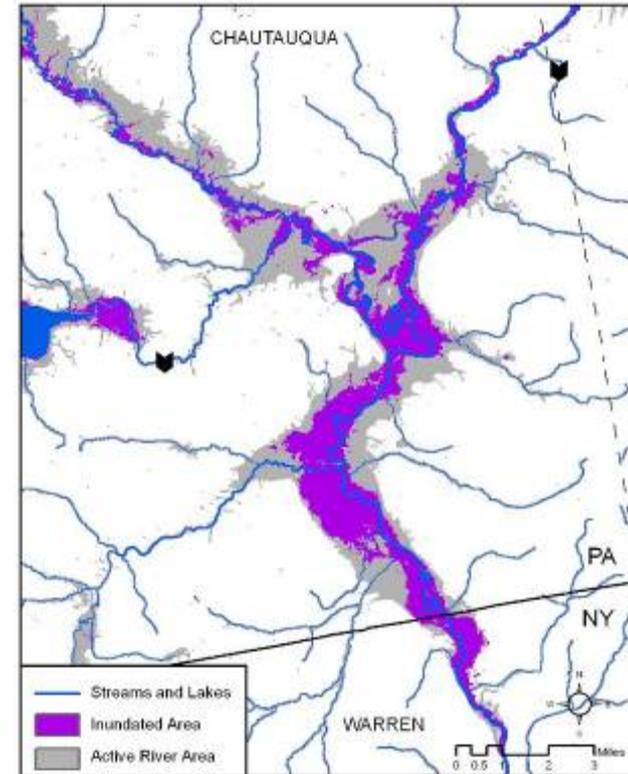
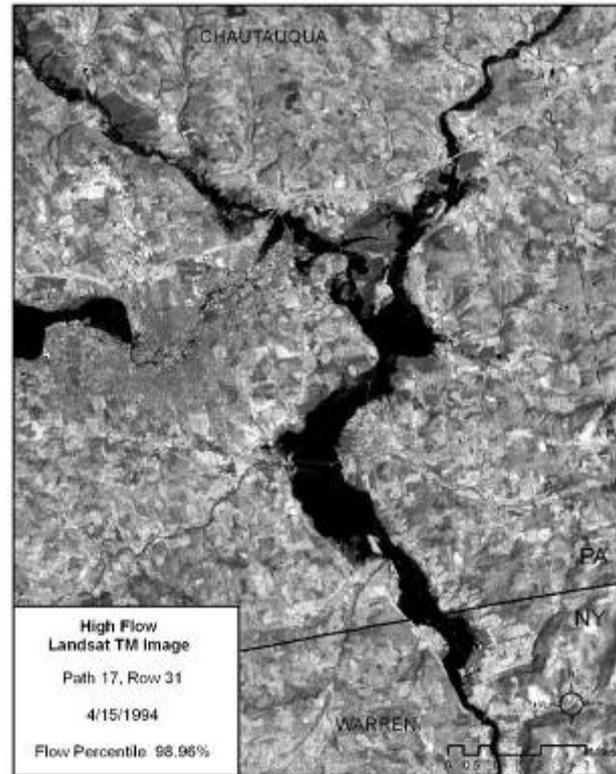
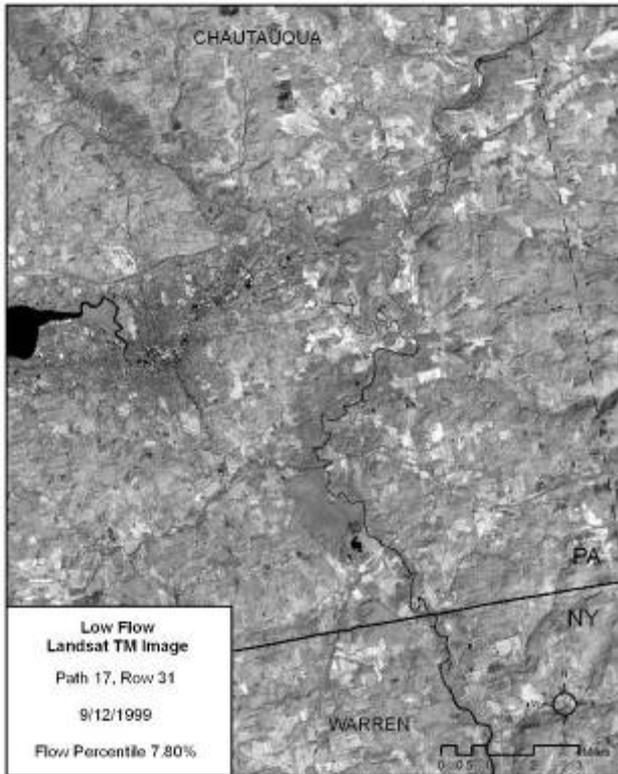
Identifying the
Active River
Area
at watershed and
regional scales



Verification: FEMA 100 year Floodplain



Verification: Current Extent of Flooding

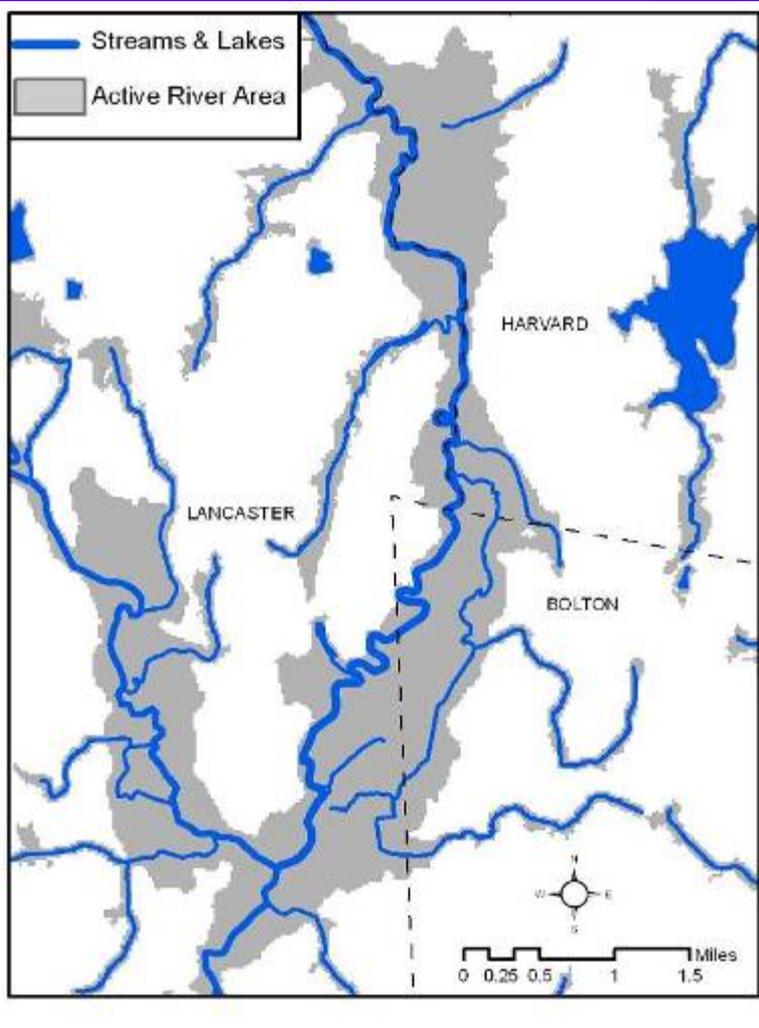


Satellite Image During
Dry Season

Satellite Image During
Wet Season

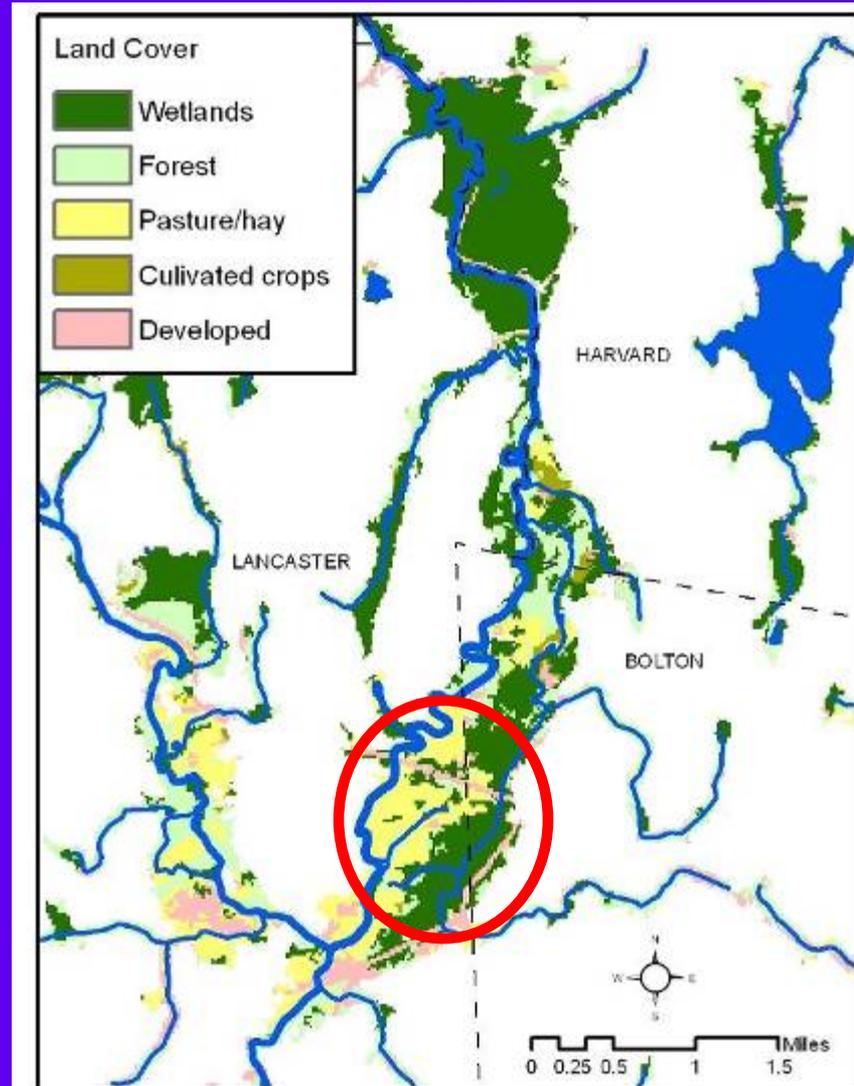
Flooded Area vs.
Mapped Active River
Area

Identifying Restoration Opportunities



Nashua River, MA

Restoration Opportunity?

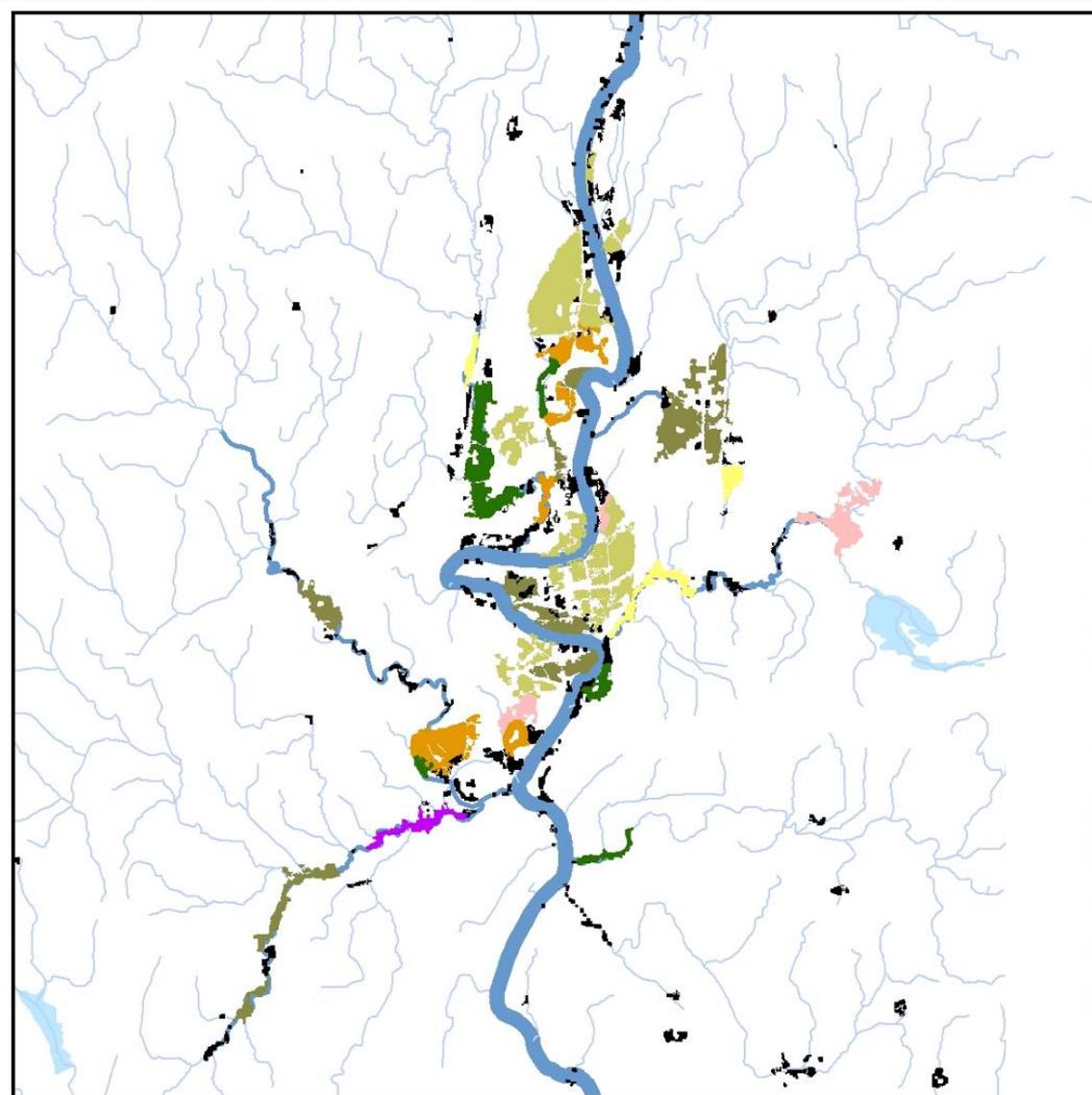


Conservation Planning

Floodplain Forest Modeling

Floodplain Forest Occurrences
Ranked on 4 Axes: Natural Cover,
Spring Flooding, Hydrologic Regime,
and Landscape Context

-  4: > Average in all 4 Axes
-  3H: > Average in all Axes except Hydrologic Regime Alteration from Dams
-  3L: > Average in all Axes except Landscape Context
-  3N: > Average in all Axes except current Natural Cover
-  3F: > Average in all Axes except Flooding
-  2: > Average in 2 Axes
-  1: > Average in 1 Axis
-  0: > Average in no Axes
-  Floodplain Occurrences < 50 acres





Ecosystem Services

- **Hazard Mitigation and Avoidance**
 - **Water Quality Protection**
 - **Recreation**
 - **Other Habitat Values**
 - **Edge Habitat Species & Communities**
 - **Movement Corridors**
 - **Scour habitats**
- 



Hazard Avoidance & Mitigation

Flood Insurance Programs

**Erosion-Hazard Management
Programs**

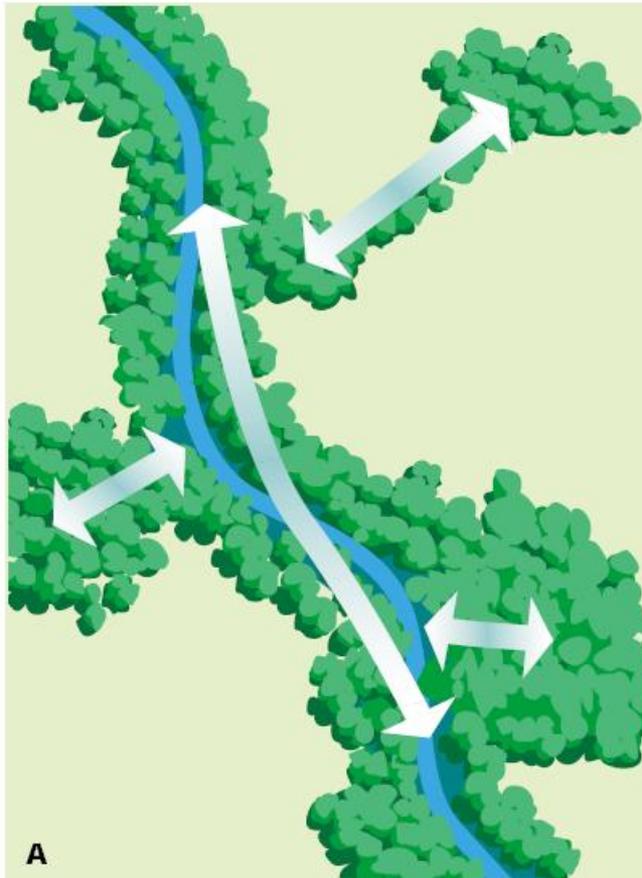
Pre-Disaster Mitigation Programs

Post-Disaster Recovery



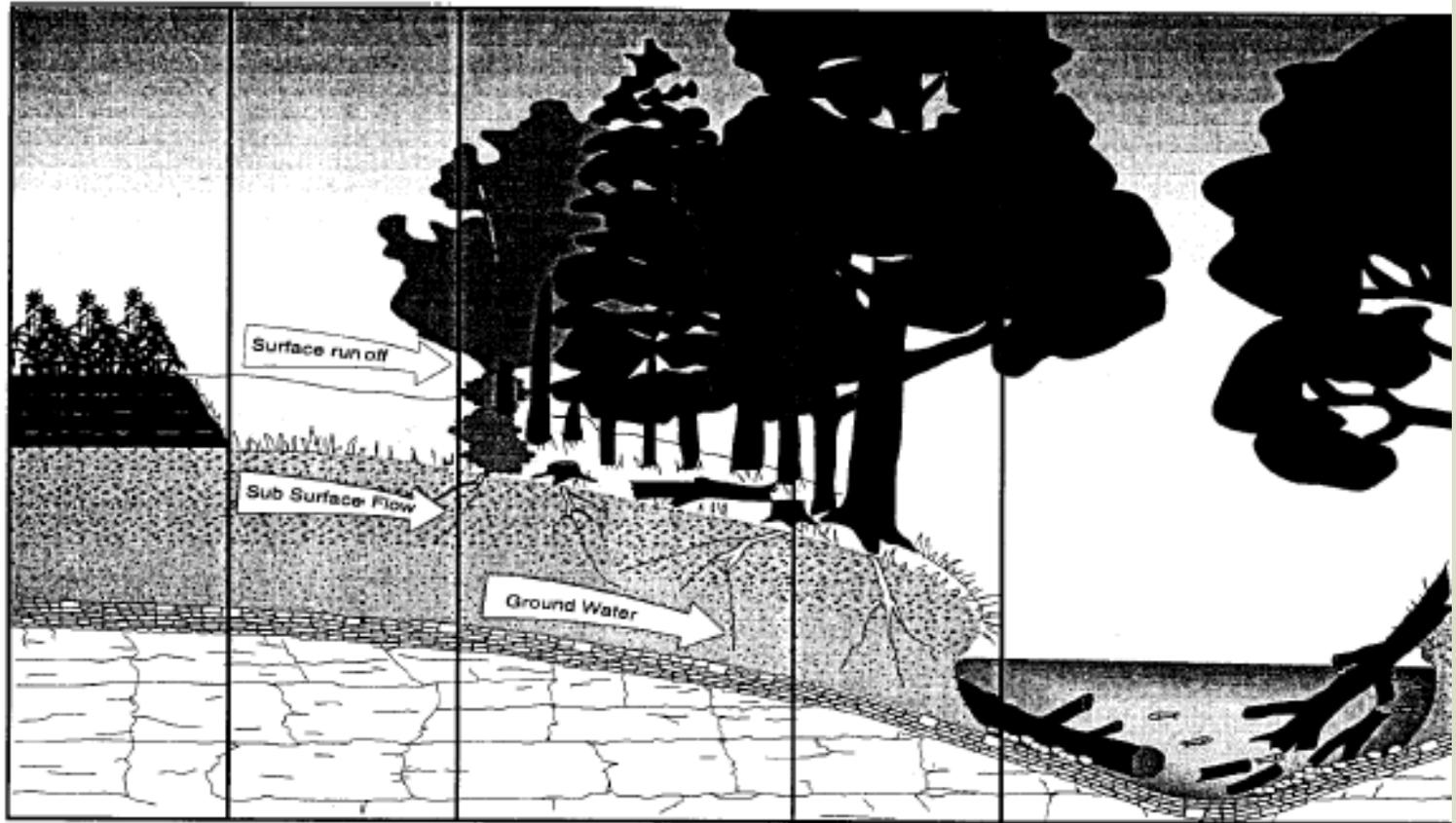
Other Habitat Values

- **Movement Corridors**



Water Quality

- **Forested Buffers**



Recreation



**Freshwater fishing
generates
\$31 billion/year in
direct economic**

activity
From: Sportfishing in America, Jan. 2008



Riparian Areas – They're not just for buffers anymore!

[Floods.org/pdf/
ASFPM_TNC_Active_River
_%20Area.pdf](https://www.floods.org/pdf/ASFPM_TNC_Active_River_%20Area.pdf)

Other Resources at:

www.nature.org/freshwater

Machias River, ME

The Nature
Conservancy



Protecting nature. Preserving life.™

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