



# Stream Connectivity and Water Quality Threats to the Middle White River Watershed

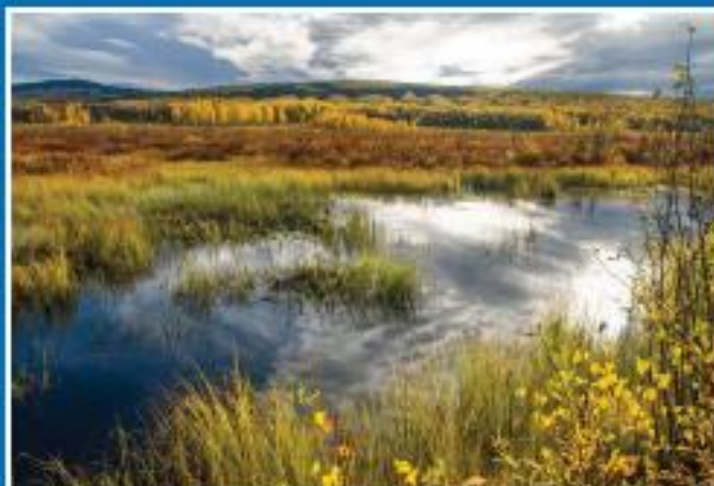
Tate Wentz

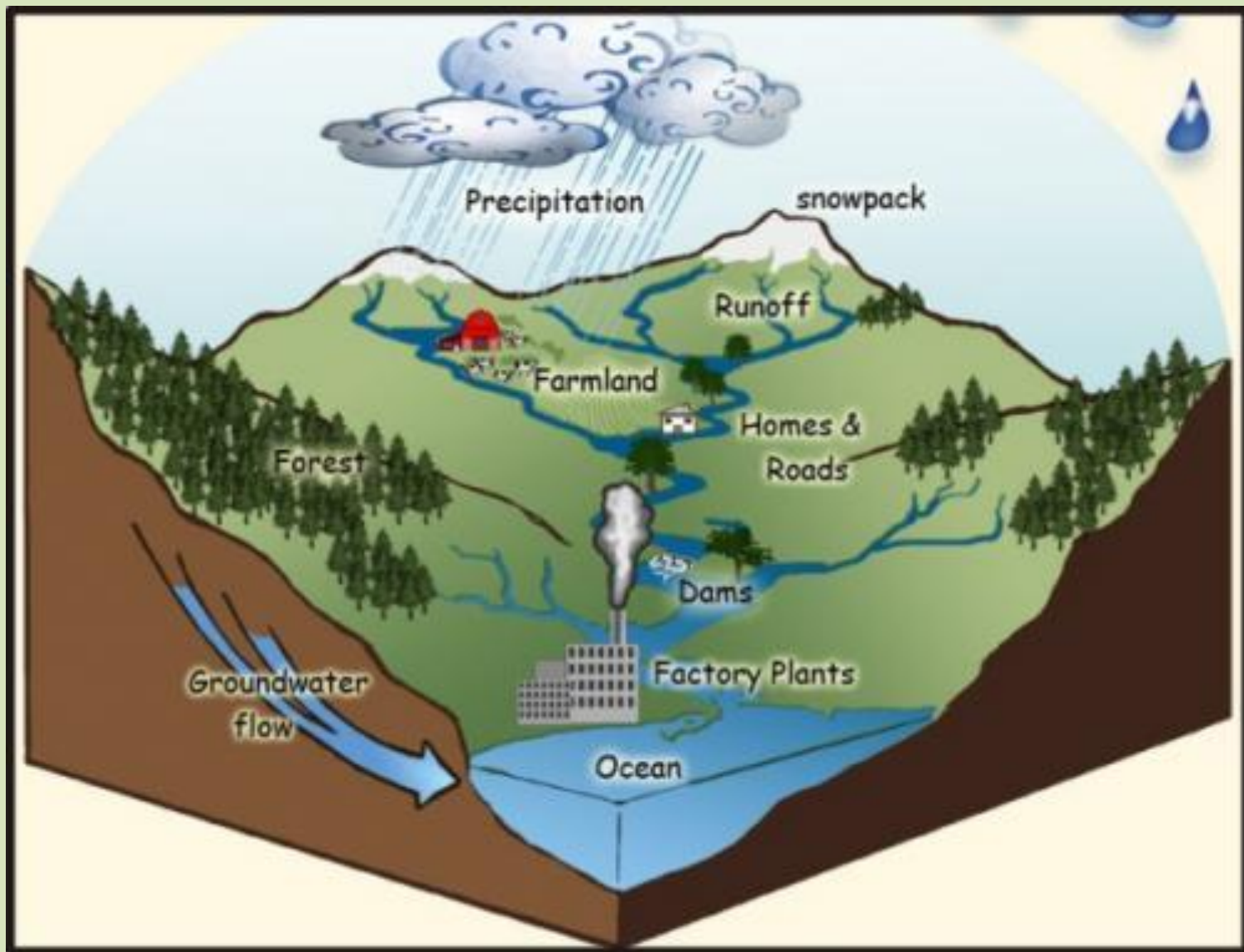
Aquatic Ecologist

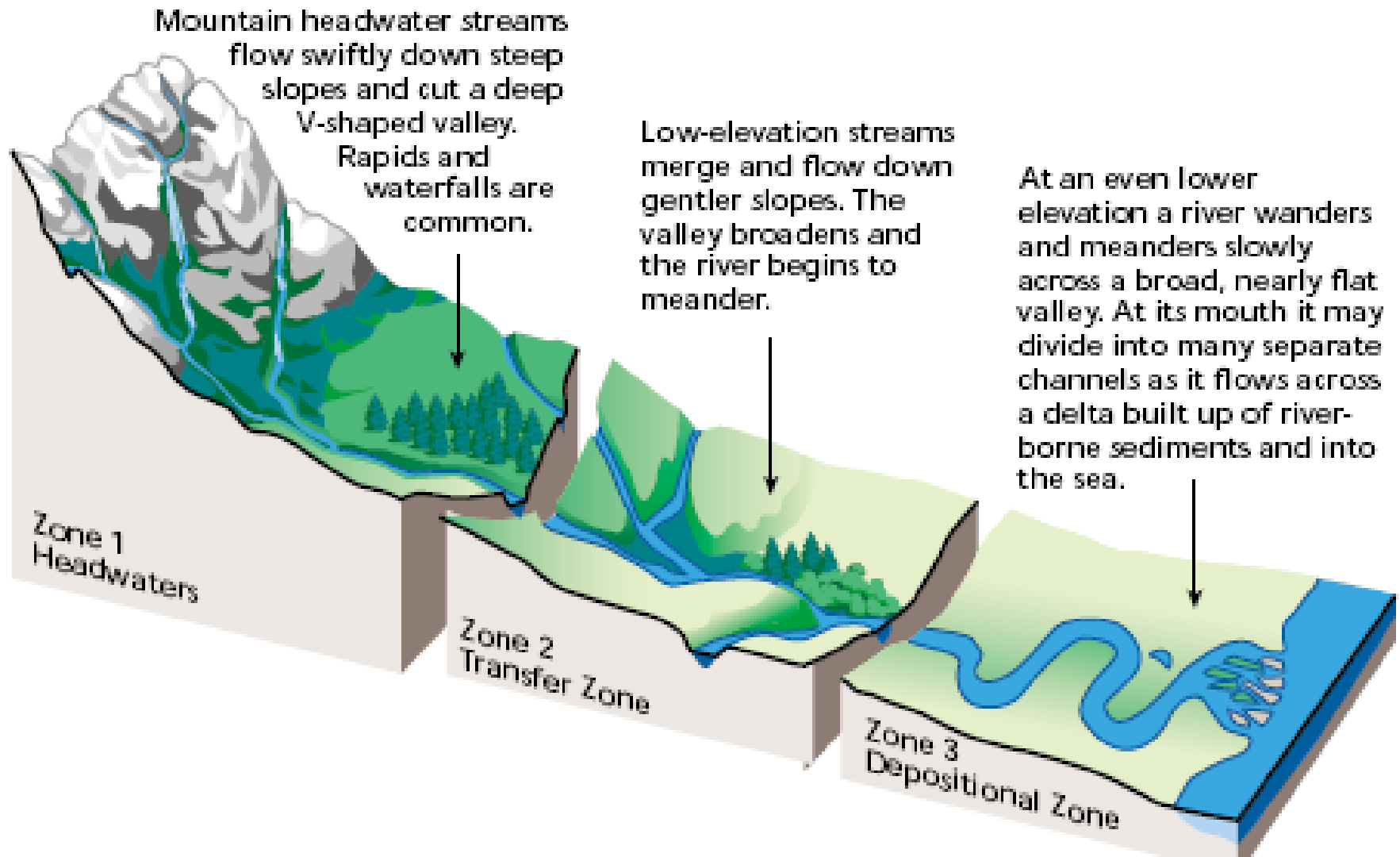
Water Division

Arkansas Department of Environmental Quality

## **Connectivity of Streams & Wetlands to Downstream Waters:** A Review & Synthesis of the Scientific Evidence



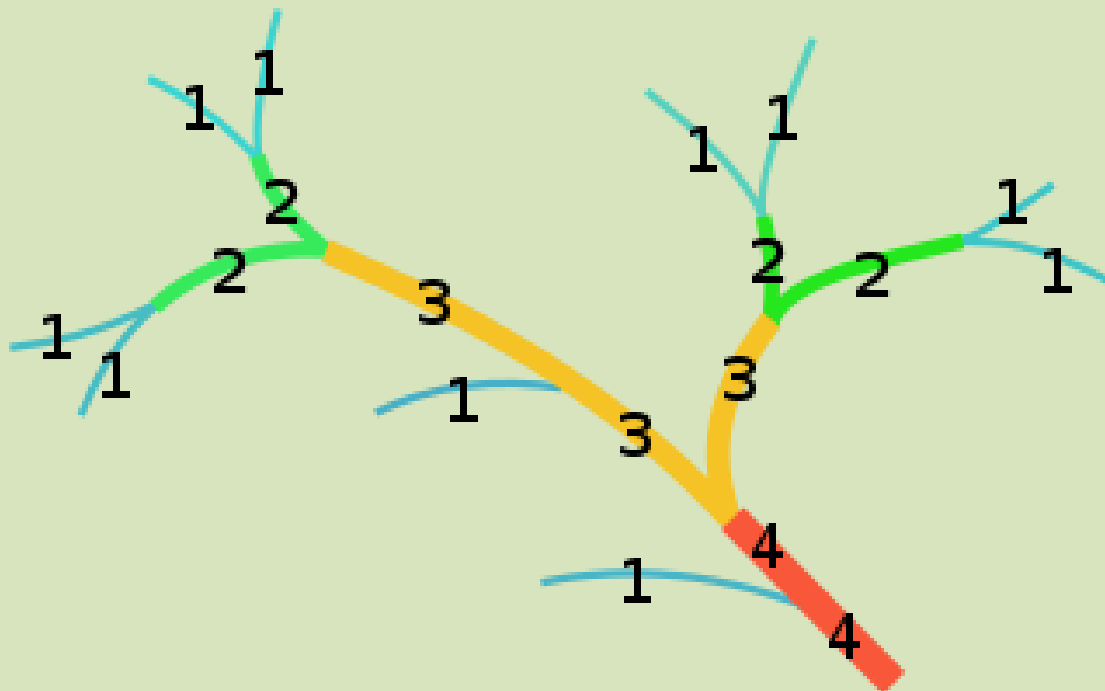




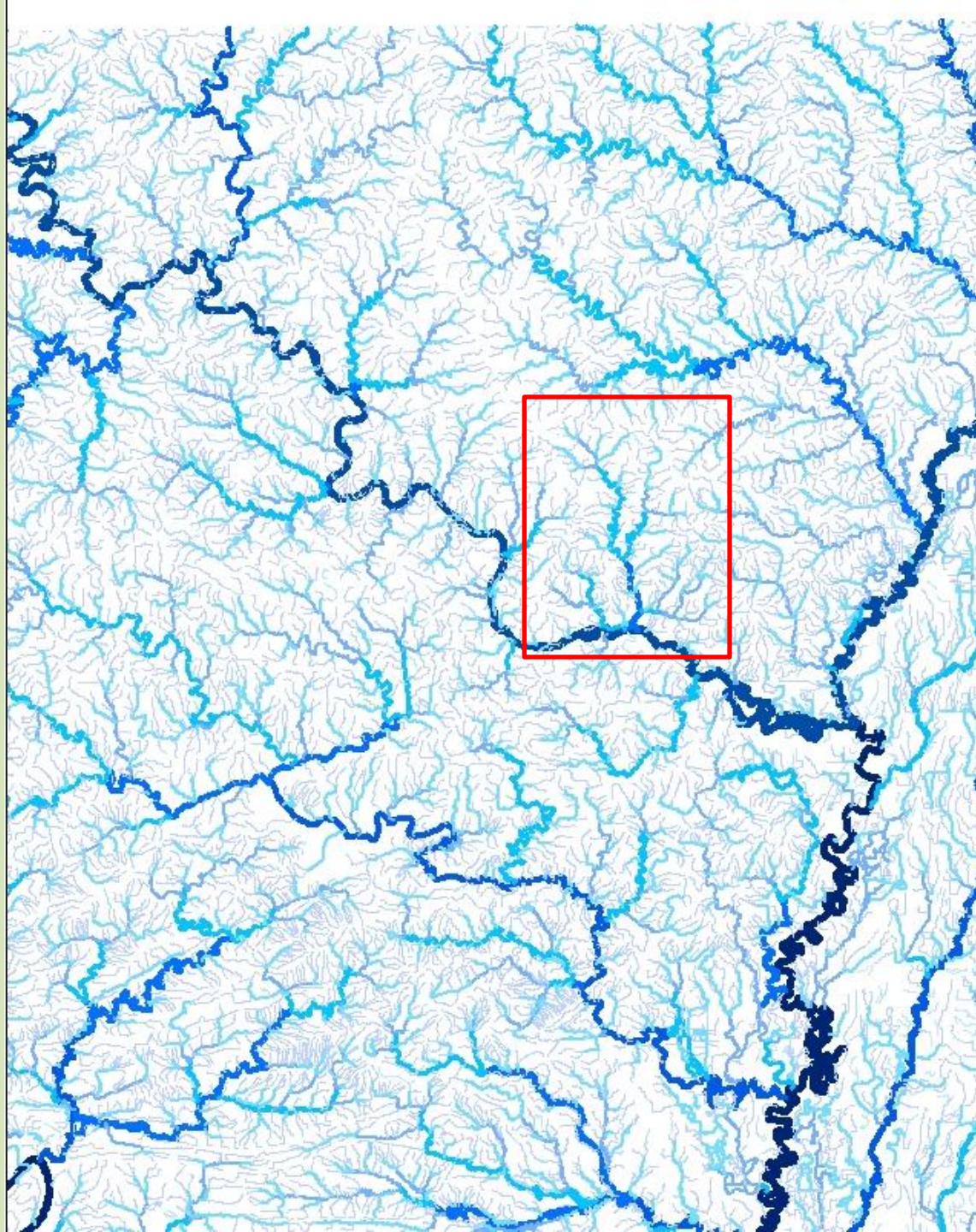
*Figure 1.27: Three longitudinal profile zones. Channel and floodplain characteristics change as rivers travel from headwaters to mouth.*

Source: Miller (1990). ©1990 Wadsworth Publishing Co.

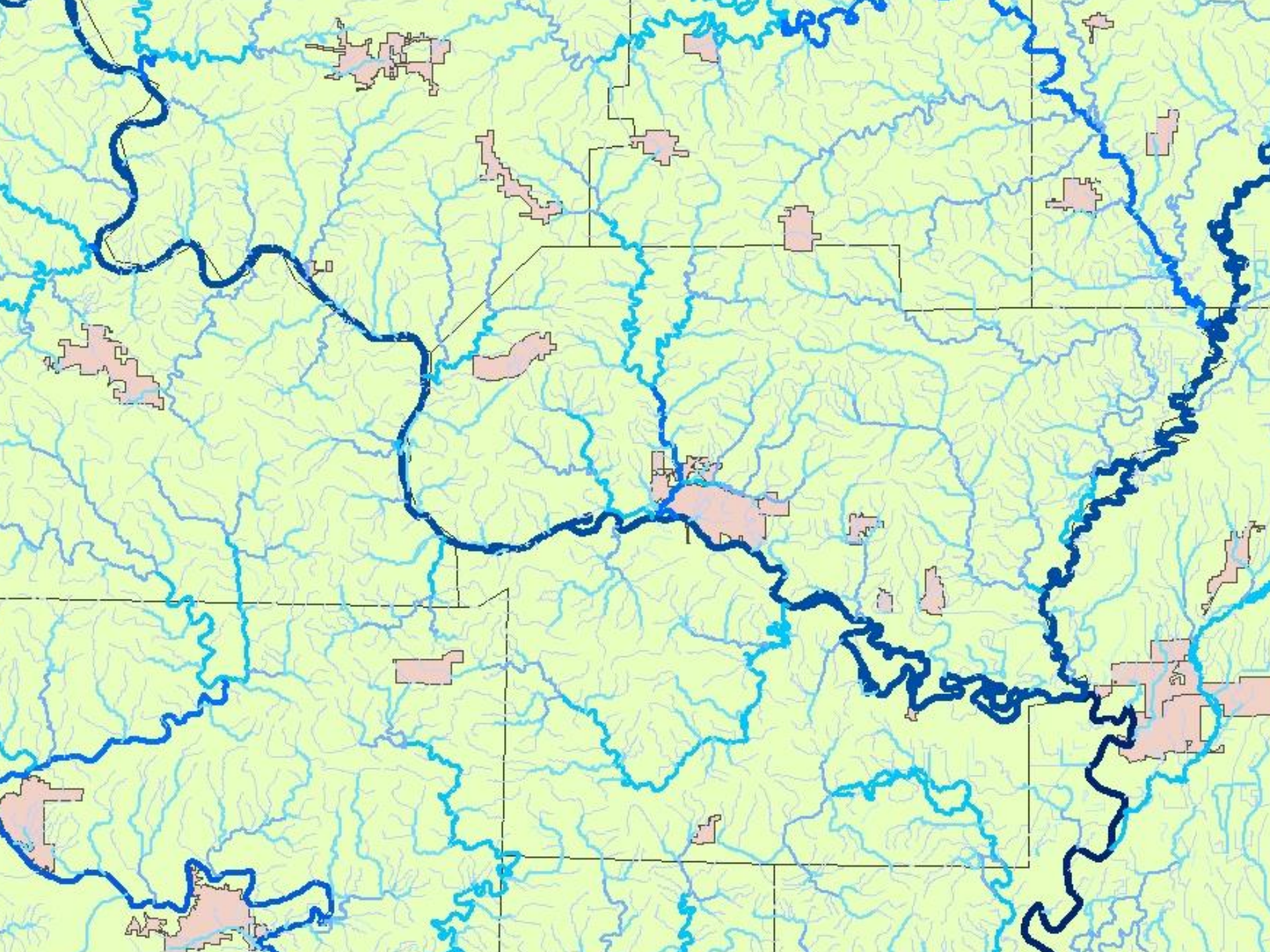
# Stream Order







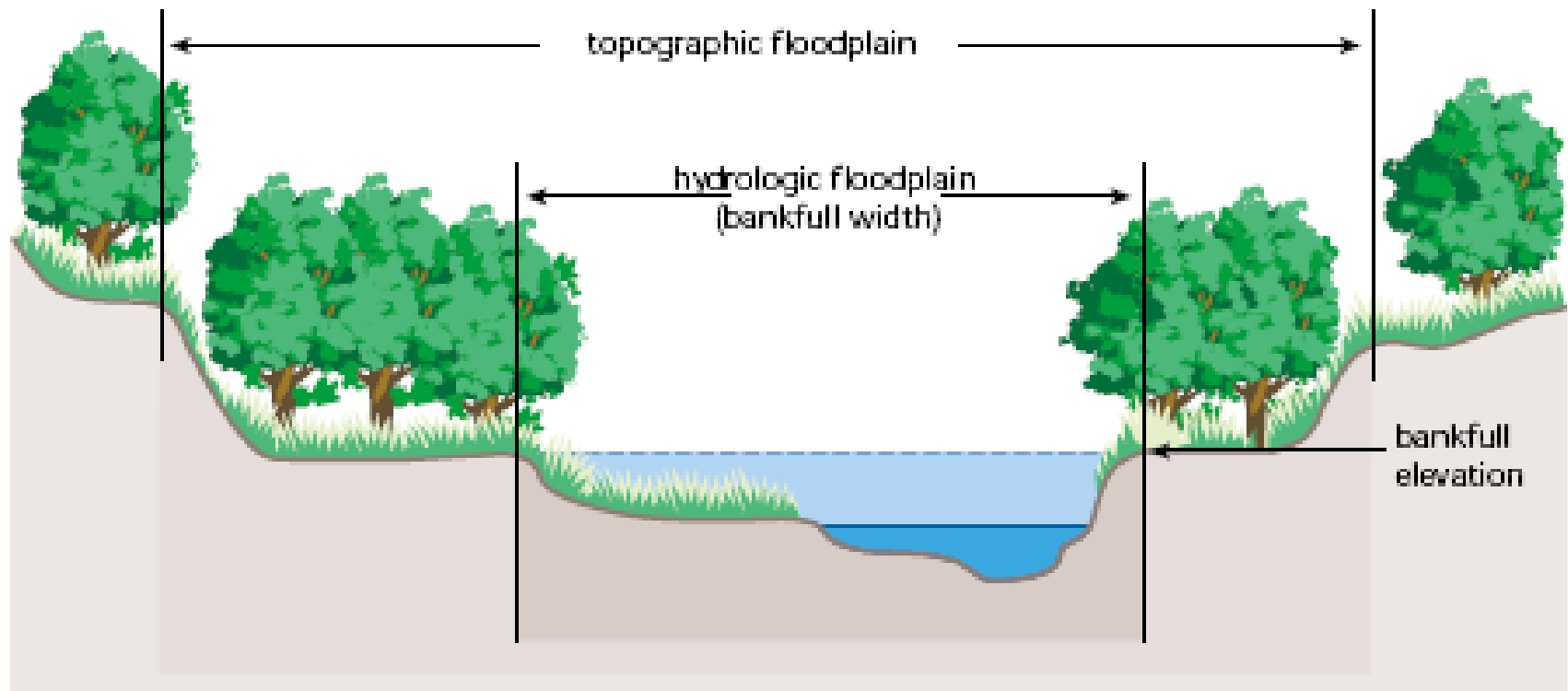




# So, why are headwater systems important?

- Source for nutrients, ions
- Sediment sink
- Decrease flooding
- Recharge
- Aquatic life
- Supply downstream water





*Figure 1.20: Hydrologic and topographic floodplains. The hydrologic floodplain is defined by bankfull elevation. The topographic floodplain includes the hydrologic floodplain and other lands up to a defined elevation.*









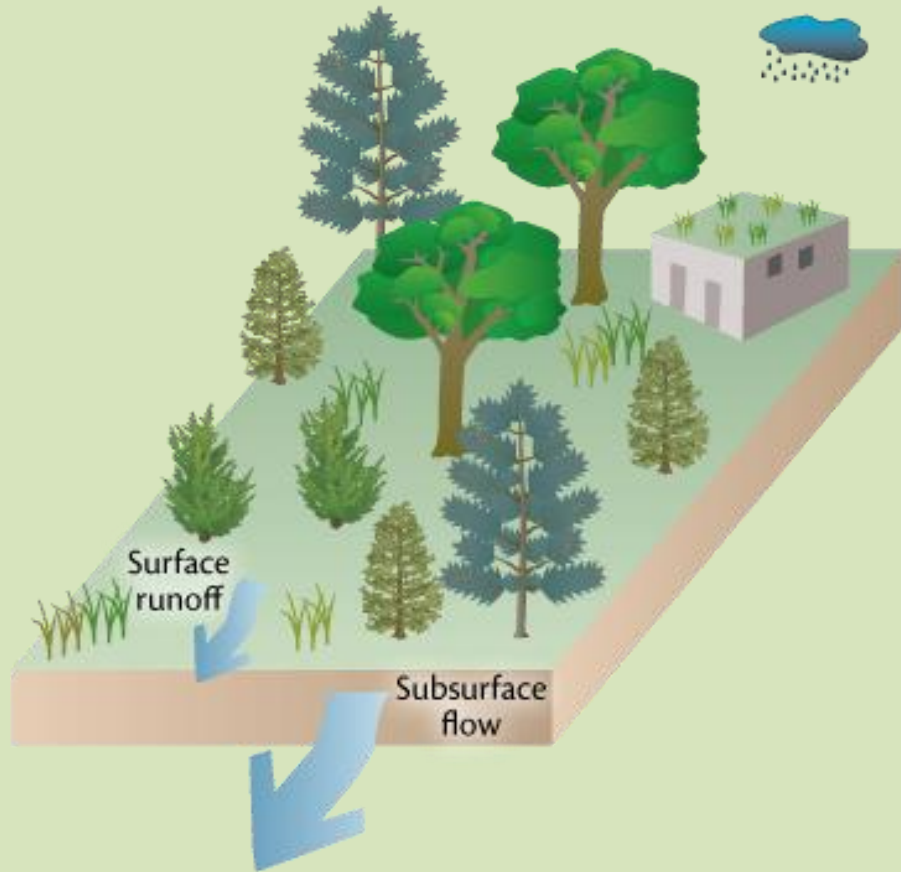




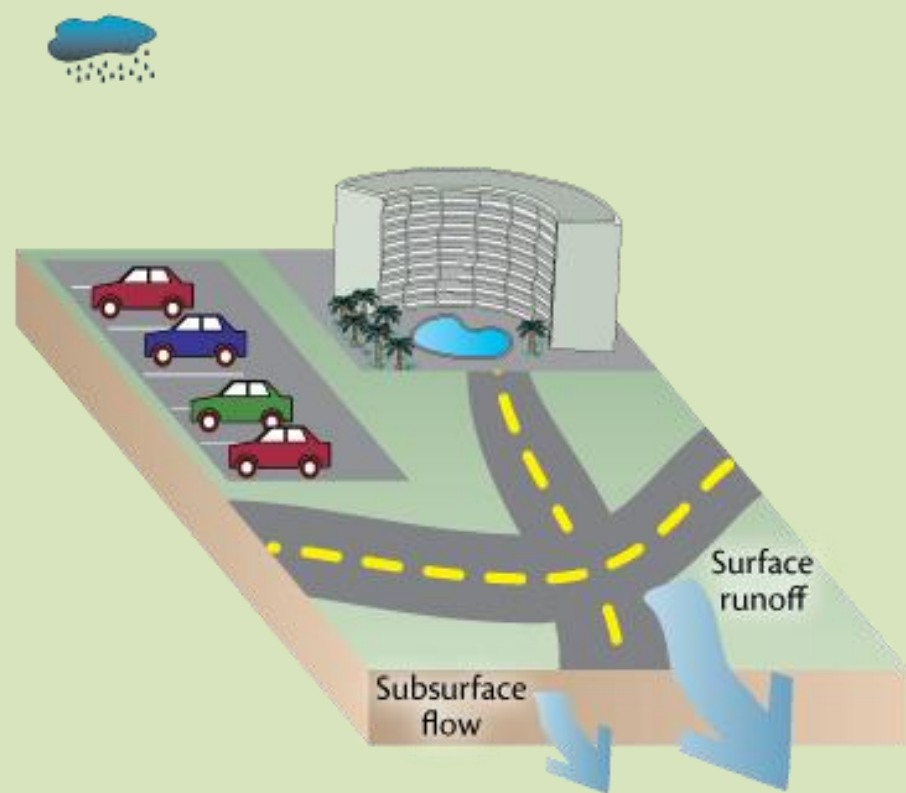
04/18/2013



**Pervious surfaces**

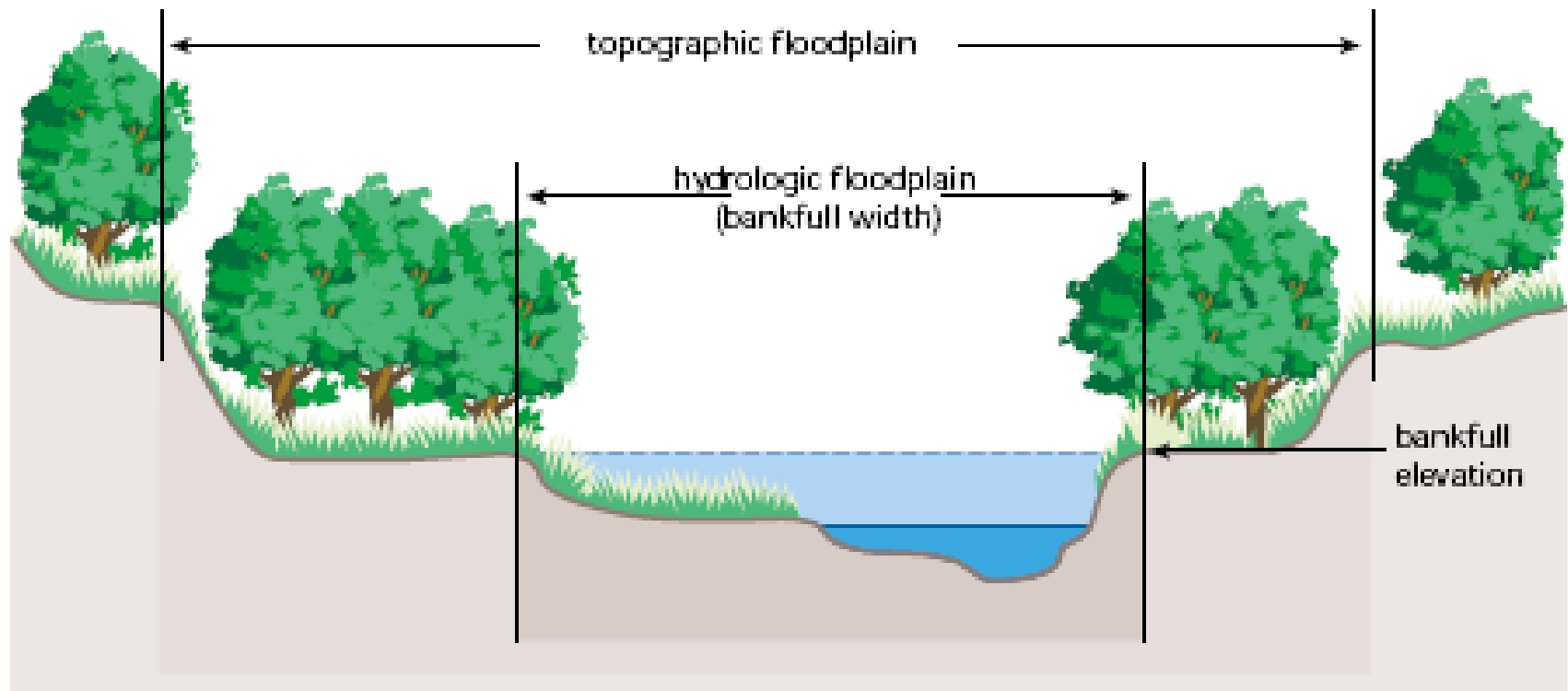


**Impervious surfaces**









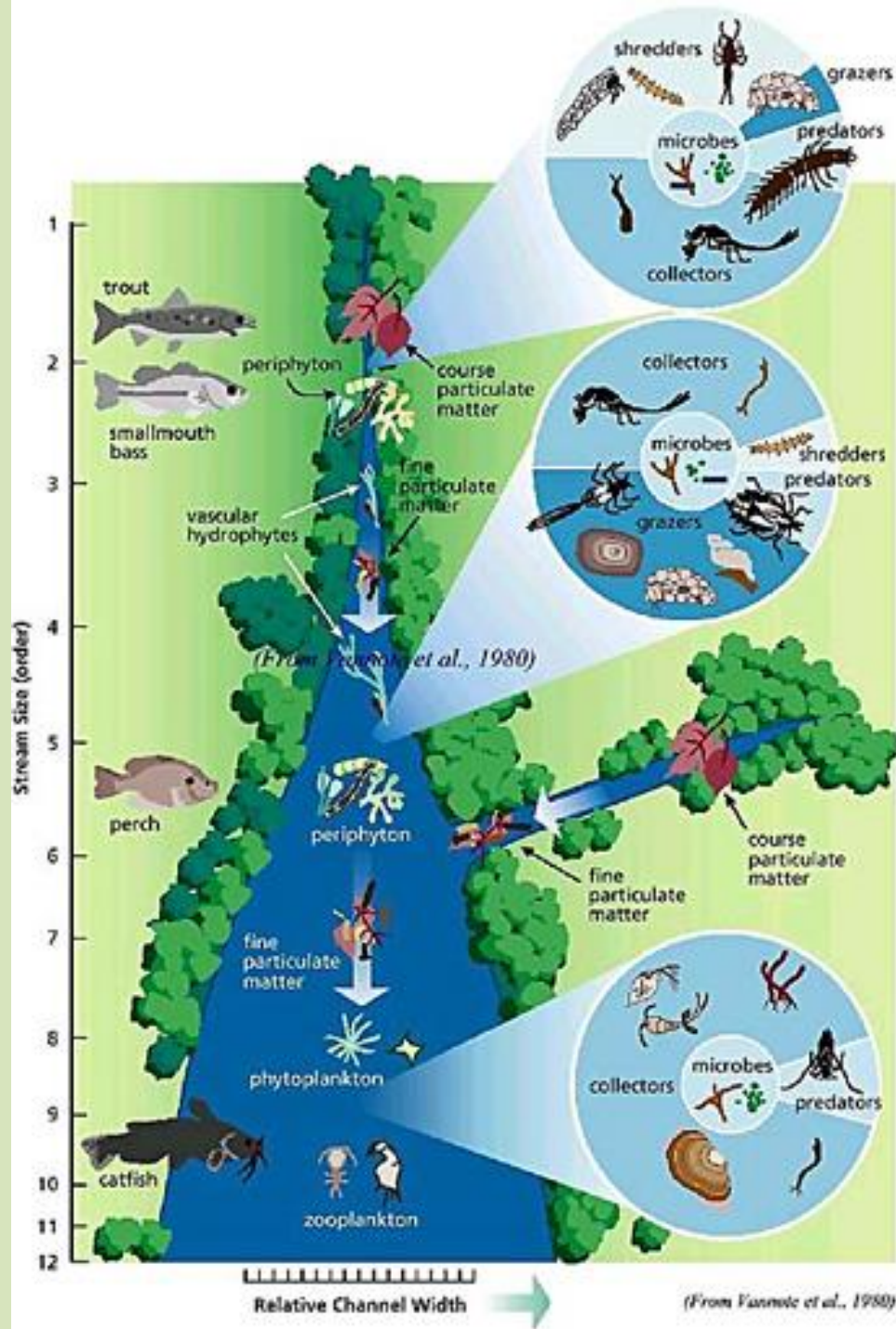
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American Eel- *Anguilla rostrata*  
averages 24-40 inches





# So, why are headwater systems important?

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# Water Uses



- Domestic – Drinking Water, Recreation, Homes
- Industrial – Manufacturing, Office, Cooling Water, Hydropower
- Commerce – Irrigation, Navigation
- Wildlife – Aquatic, Terrestrial





# What are the Issues?

- Water Quantity
  - Too Much, Too Little, Wrong Place
- Water Quality
  - Pollution, Invasive Species
- Competing Uses
  - Aquatic Life, Drinking Water, Irrigation, Recreation, Aesthetics

# Water Quality Issues?

- Turbidity/Sediment
  - Agriculture, Construction, Unpaved Roads, Instream Erosion
  - Channel Modification, Mining, Recreation
- Minerals (Chlorides, Sulfates, Total Dissolved Solids)
  - Agriculture, Point Sources, Urban Runoff, Mining
- Metals (Copper, Lead, Zinc)
  - Agriculture, Mining, Point Sources, Construction
- Pathogens – *E. coli*
  - Confined Animal Operations, Agriculture, Septic Tanks
- Other (Temperature, pH, Dissolved Oxygen, Mercury)
  - Agriculture, Mining, Point Sources, Construction, Hydropower



# AquaView v1.0

A scenic photograph of a person in a small motorboat on a river. The person is wearing a hat and a plaid shirt, and is seen from behind. The river is calm with some ripples. In the background, there is a large, steep hill covered in dense green forest. The sky is blue with some white clouds. The overall scene is peaceful and natural.

# ADEQ

ARKANSAS  
Department of Environmental Quality

*"To protect, enhance, and restore the natural environment for the well-being of all Arkansans."*