

Riparian-Wetland Areas



Presentation Objectives

- Provide information on riparian –wetland properties.
- Describe relationships with hydrology, vegetation, and soils (geology and landform).
- Apply riparian – wetland concepts to road management.

Riparian



Wetland



Wetlands

- Areas inundated, or saturated by surface or ground water, for a length of time sufficient to create oxygen-deficient soil; this is *wetland hydrology*.



Wetlands

Soil that is saturated, flooded, or ponded enough during the growing season to develop anaerobic (oxygen-deficient) conditions in the upper part of the soil profile; these are referred to as *hydric soils*.

Gray colors will dominate the soil profile because these soils become anaerobic (lacking oxygen) in shallow depths.



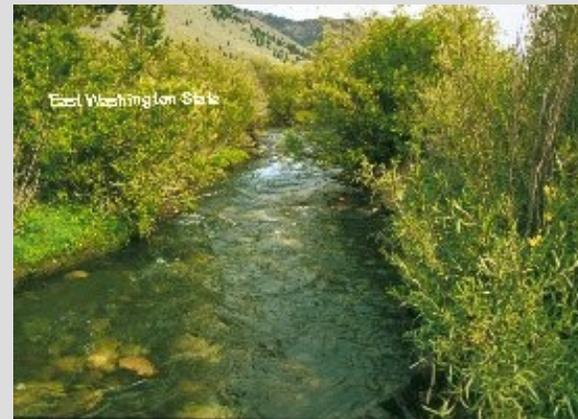
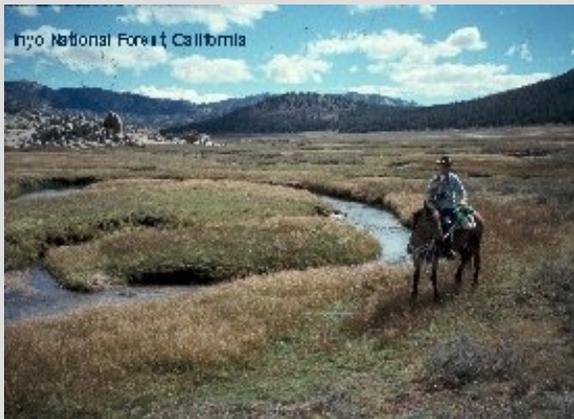
Supports a prevalence of vegetation suited to, or requiring, the presence of water and anaerobic soil during all or part of the growing season; such plant species are referred to as *hydrophytic vegetation*.



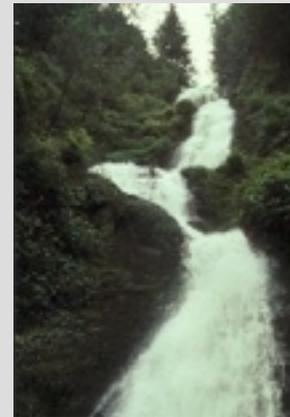
Wetlands



Riparian Areas

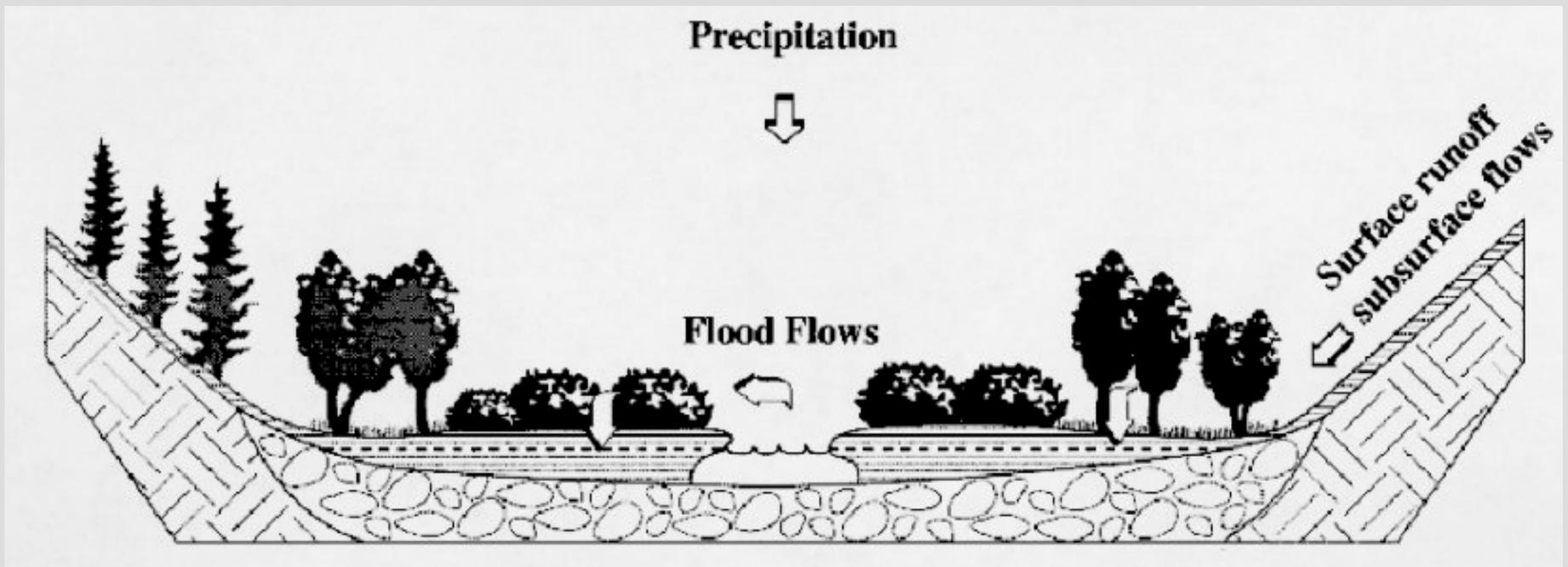


Riparian Areas





Riparian-Wetland Functions



- ❖ Stores and releases water over a longer period of time
- ❖ Dissipates energy of flowing water
- ❖ Provides water quality
- ❖ Traps sediment
- ❖ Builds and maintains streambanks
- ❖ Provides wildlife habitat



Buena Vista Road



Chemicals & Minerals

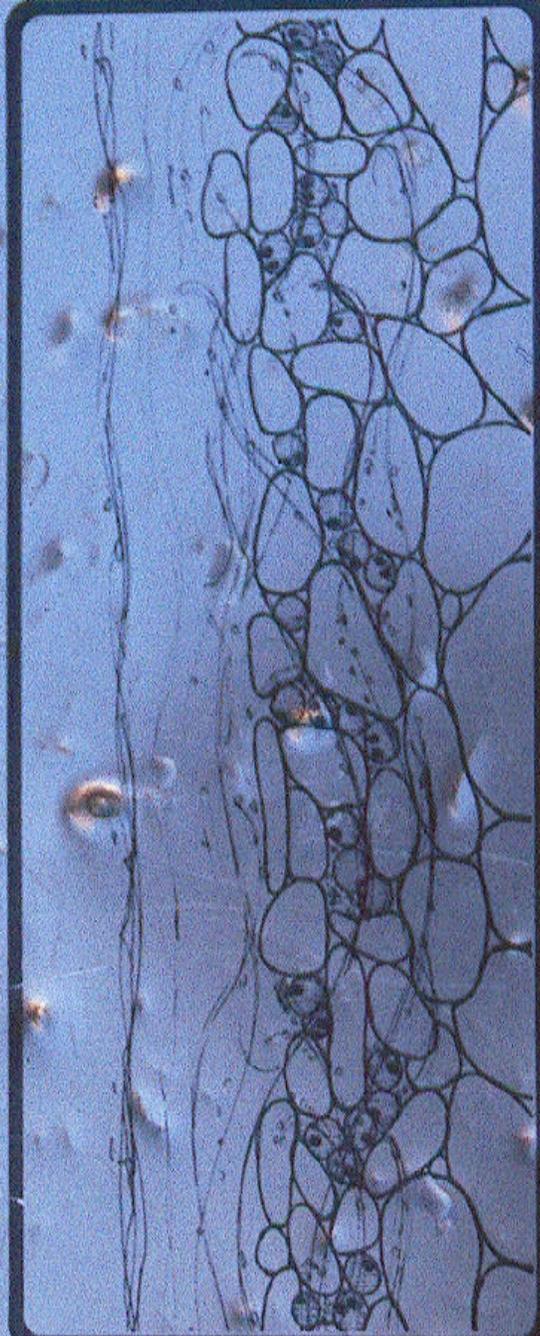




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Nature's Fish Hatchery

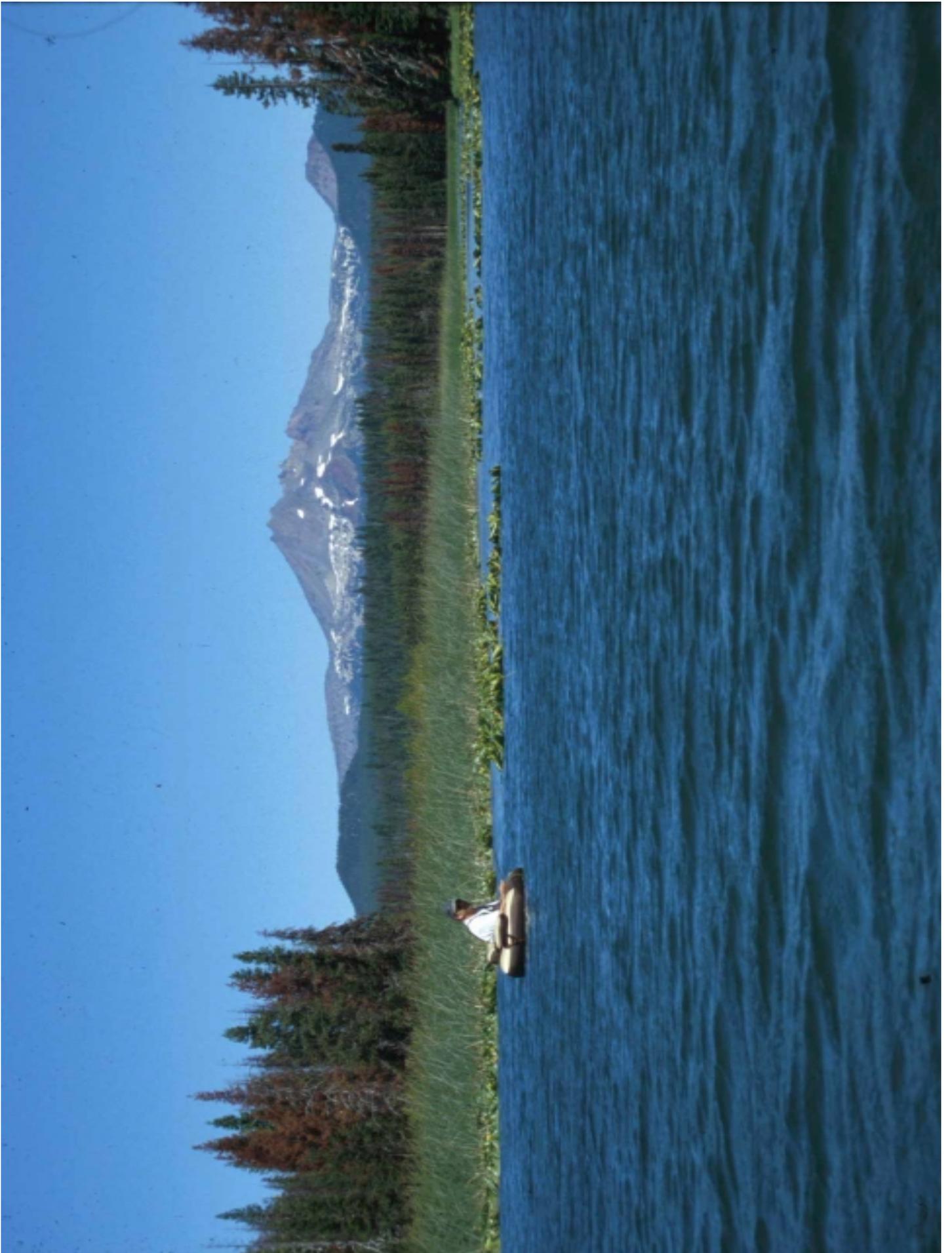
Trout and Salmon deposit their eggs in clean beds of gravel covered with a thin layer of pebbles. Water circulates between the pebbles carrying vital oxygen to each egg.



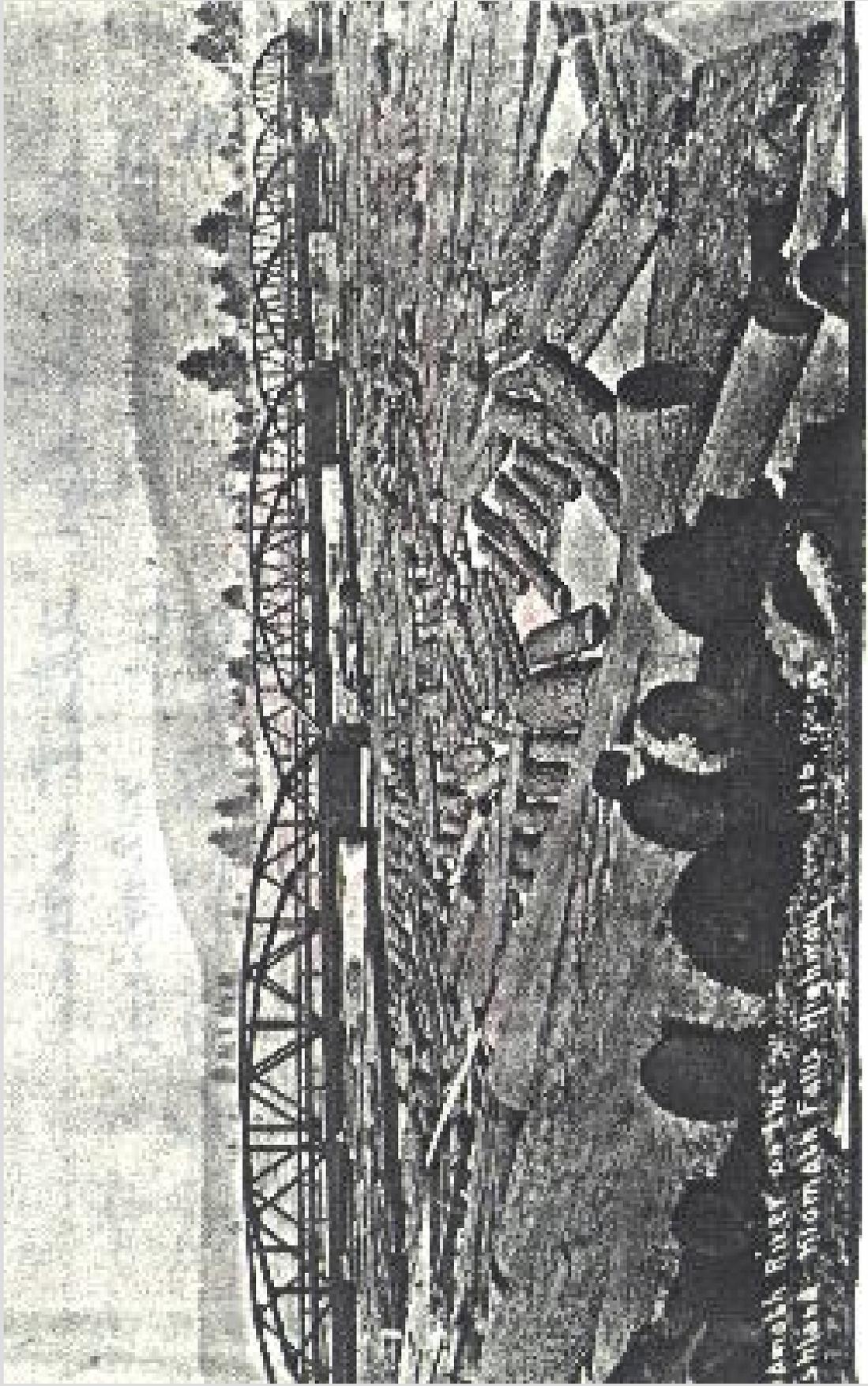


**Clear Creek, a
critical Chinook
salmon spawning
area in California.**









BRIDGE OVER THE
SHAW-MUMFORD FARM HIGHWAY NO. 115



Figure 1

High-standard roads in steep mountains cause startling disfigurement of the landscape and serious damage from erosion of the unstable fill slopes. This view shows portions of a double switchback on the Angeles Crest Highway in the Arroyo Seco, Angeles National Forest.



Klamath National Forest Flood of 1997

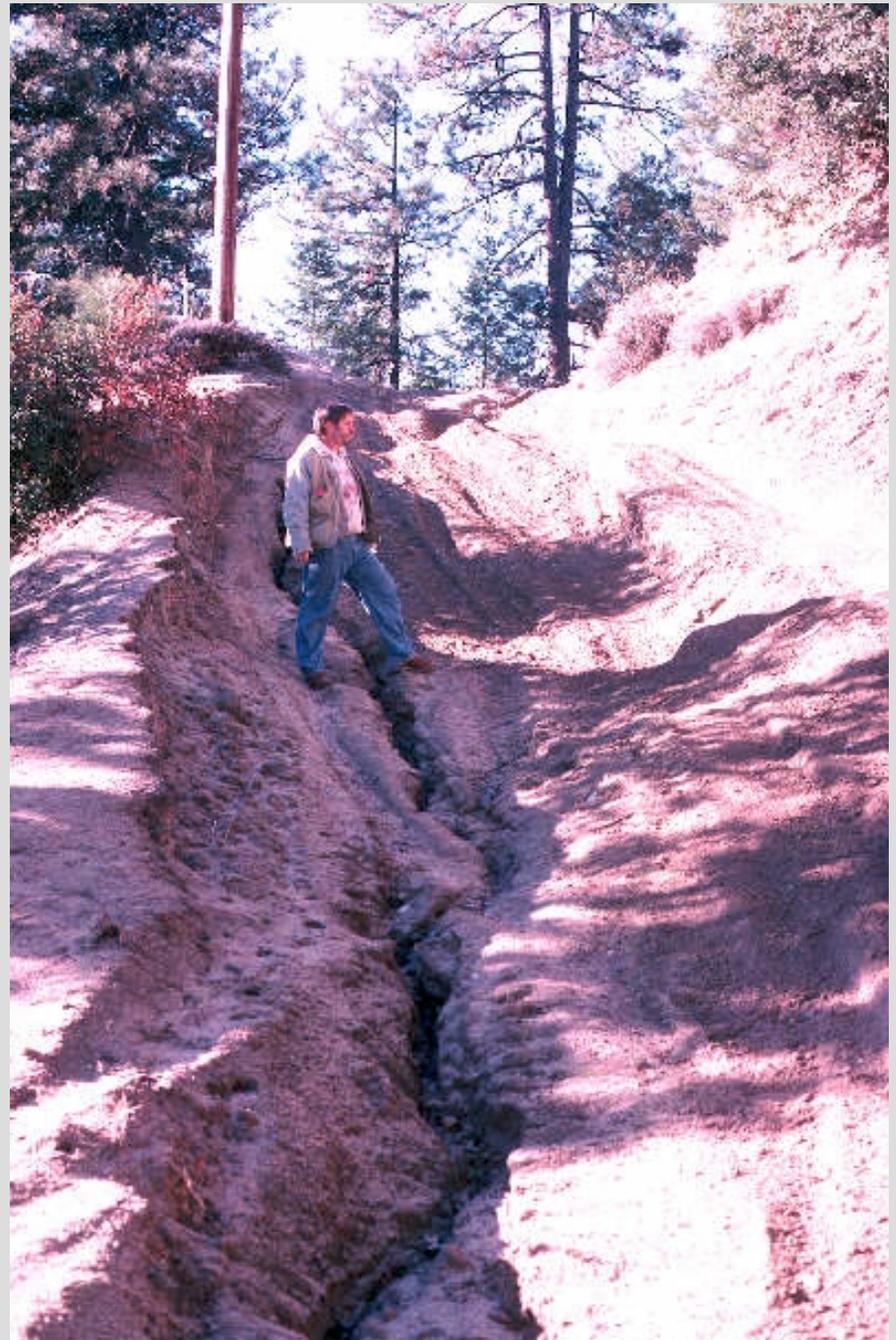
712 Landslides Occurred
87% Were Road-Related



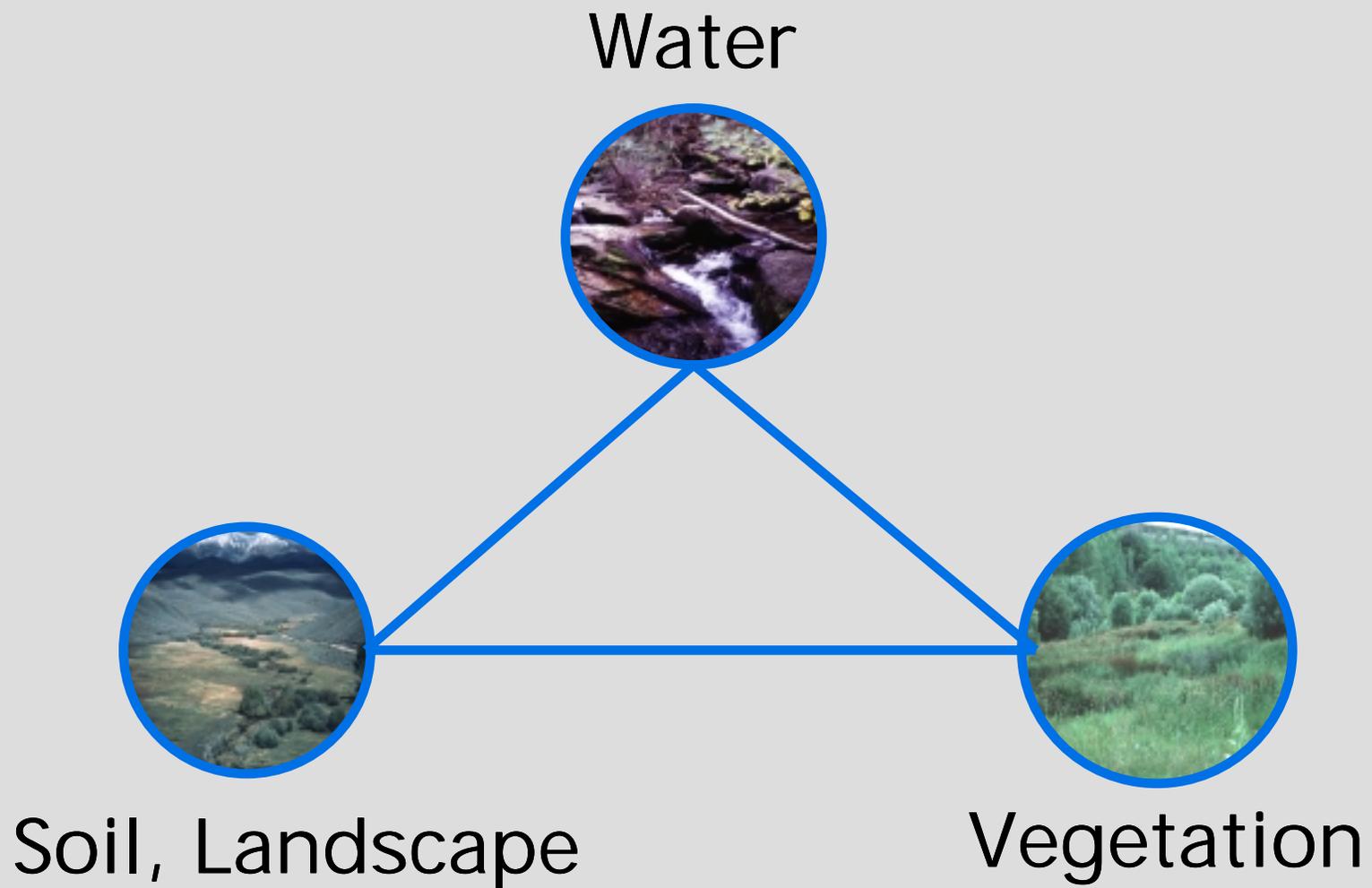




The Forest Service has a backlog of more than \$8.5 *billion* in road maintenance and reconstruction needs.

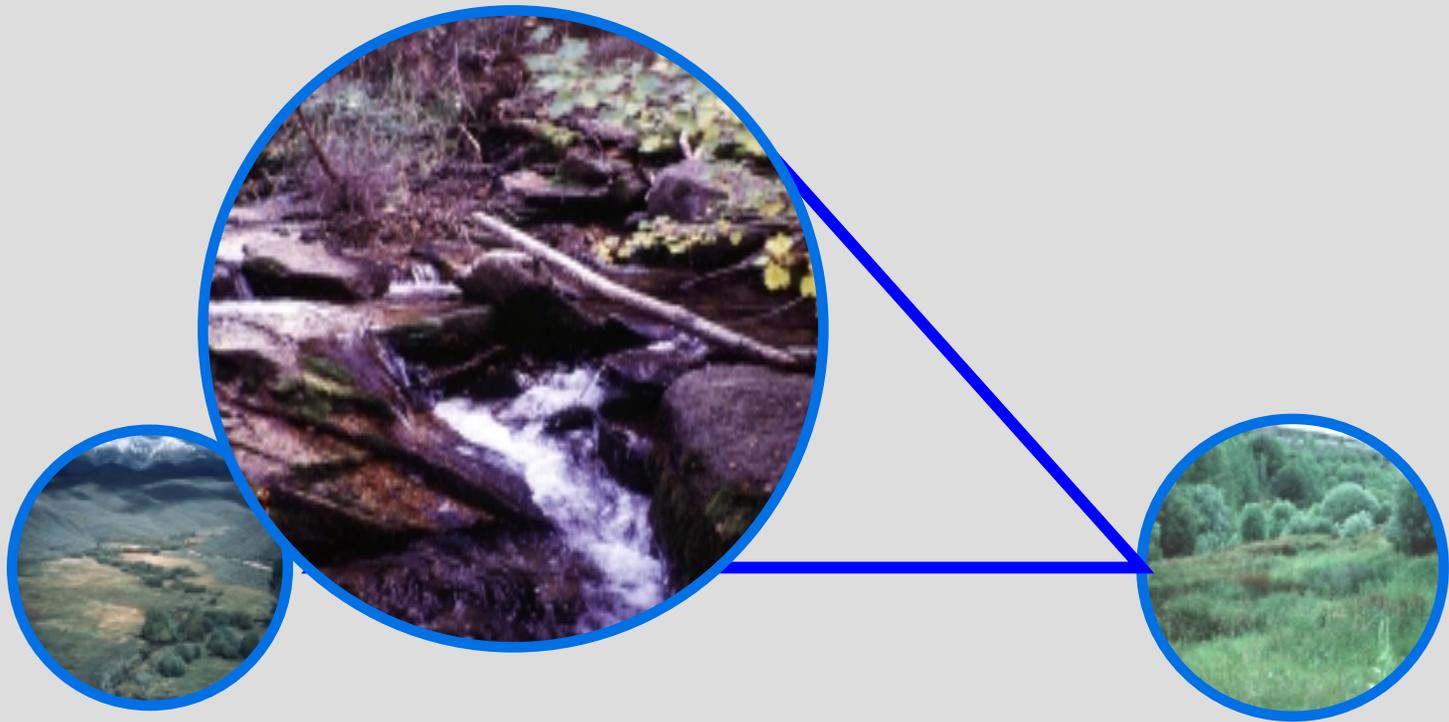


Riparian - Wetland Resources



Hydrology

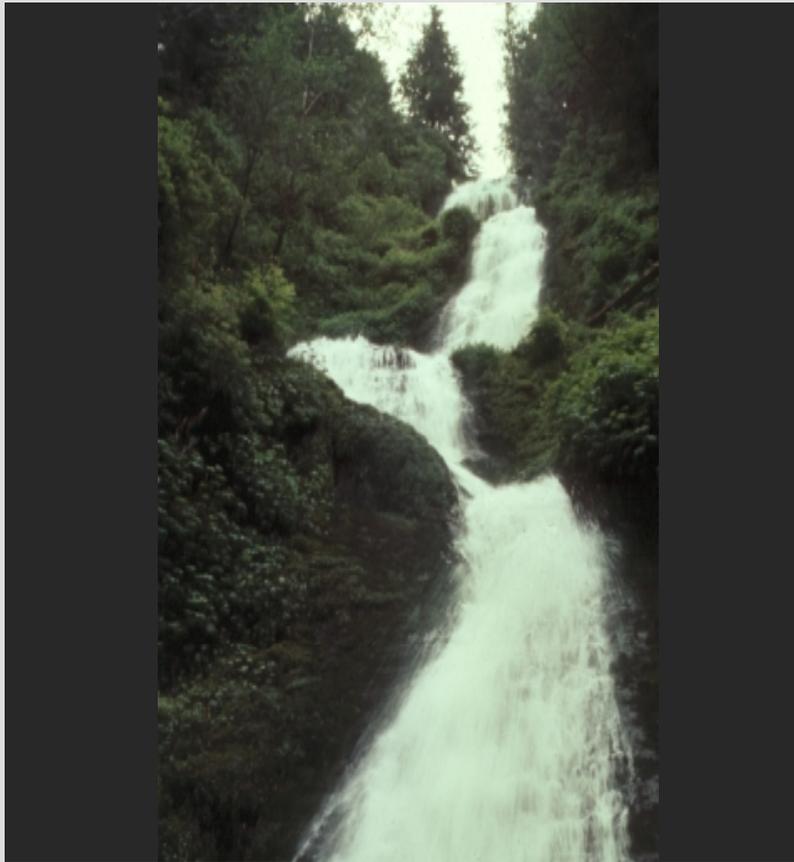
Water



Landscape & Soil

Vegetation

Source Areas



- Steeper the slope = higher the erosion rate
- Steep gradient streams, with high water velocity, are "source" areas - efficient at moving fine materials such as sand/silt/clay.

Transport areas



- Moderate moving streams “transport” sand, silts, and clays, and also leave gravel, cobbles, boulders, and wood in the active channel.

Depositional areas



- Slow moving streams deposit fine materials, such as sand, silt, and clays, from the source and transport reaches.

Lentic Types

"Standing Water"



Soil



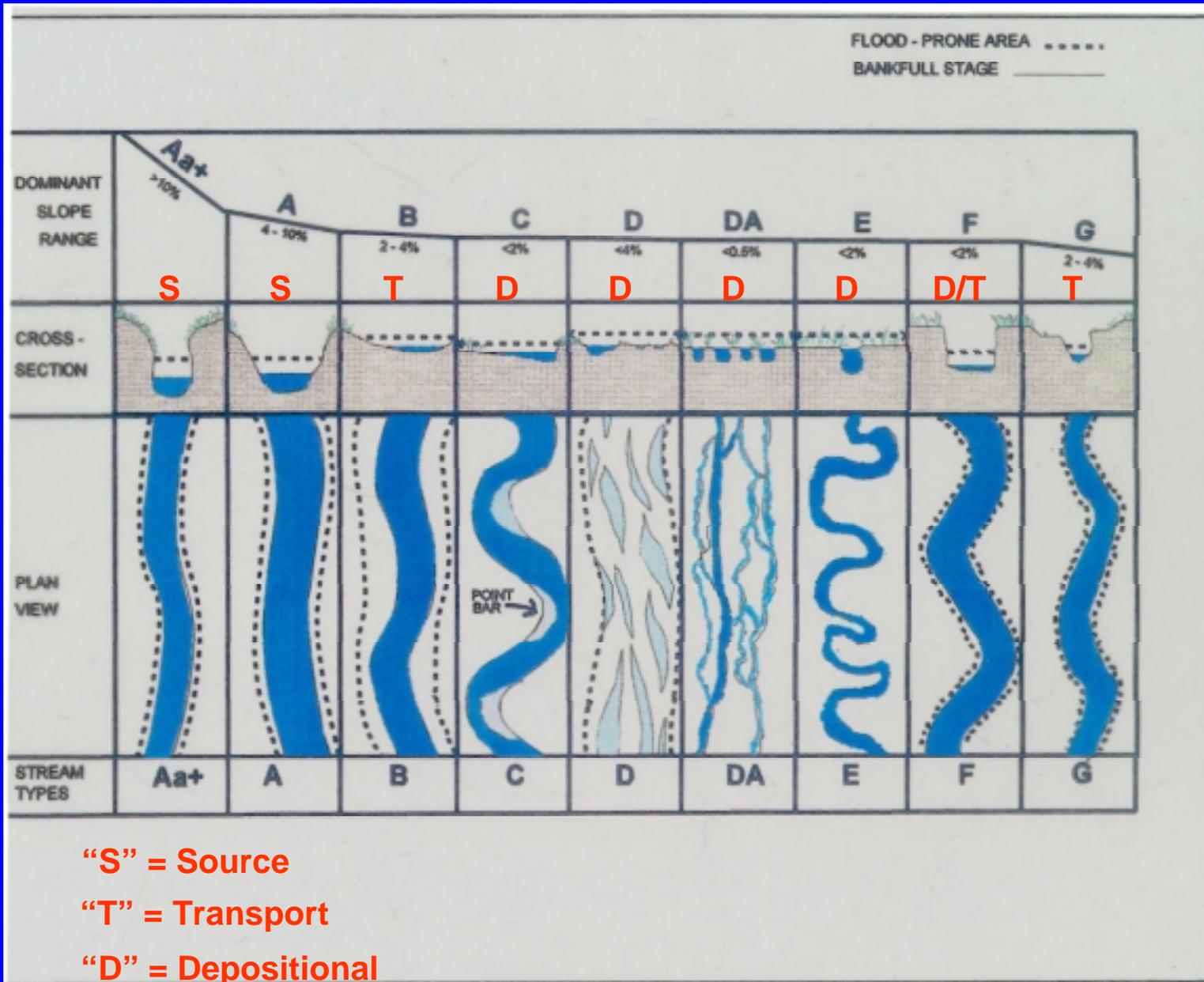
Water



Soil (geology & landscape)



Vegetation



“S” = Source

“T” = Transport

“D” = Depositional

Longitudinal, cross-sectional, and plan views of major stream types (after Rosgen 1994)



SAND

SILT

SAND

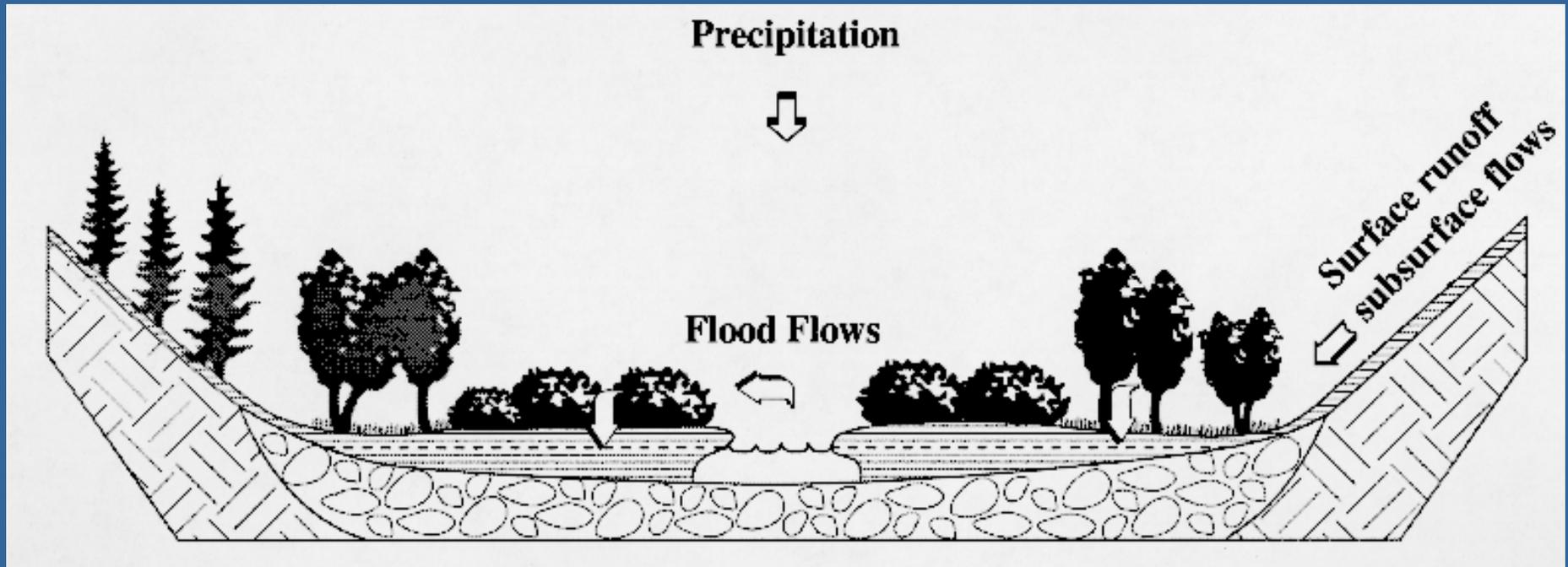




Debris torrent



Riparian – Wetland Soil Functions



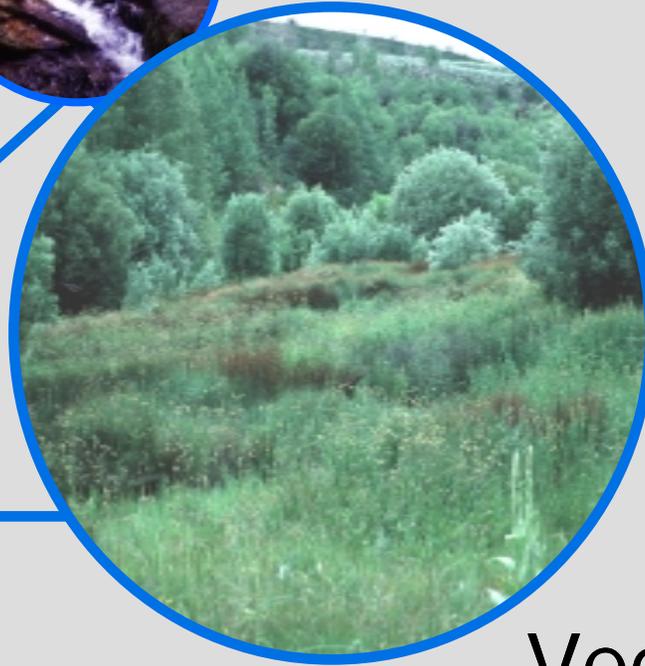
- ❖ Capture runoff from adjacent lands, water from high flows, and precipitation
- ❖ Infiltration of water into soil for gradual release into streams and to recharge ground water
- ❖ Serves as a medium for plants and microorganisms to cycle nutrients
- ❖ Stores nutrients otherwise discharged from the watershed
- ❖ Filters and immobilizes pollutants

Vegetation

Water



Landscape & Soil



Vegetation

Alaska



Riparian-Wetland changes by:

- Flooding (either temporary or more long-term, as caused by beavers or man-made structures;
- Deposition of sediment on streambanks and across floodplains;
- Accumulation of organic materials in areas such as wet meadows and bogs;
- Dewatering of a site by a variety of means; and
- Changes in actual channel location.
- Drought.













BEFORE



AFTER



BEFORE



AFTER

Functions of Riparian-Wetland Areas

- Stores and releases water over a longer period of time



Functions of Riparian-Wetland Areas



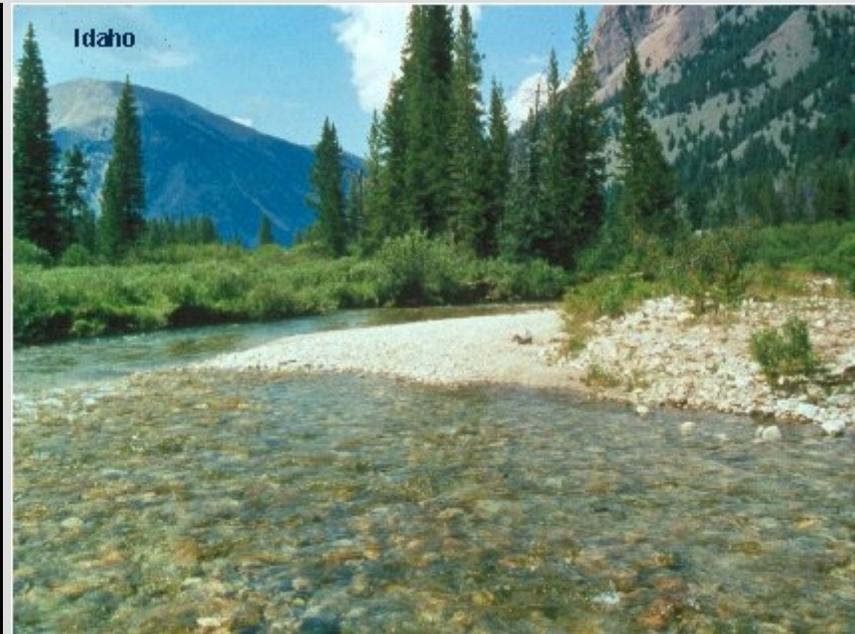
- Dissipates energy of flowing water

Functions of Riparian-Wetland Areas



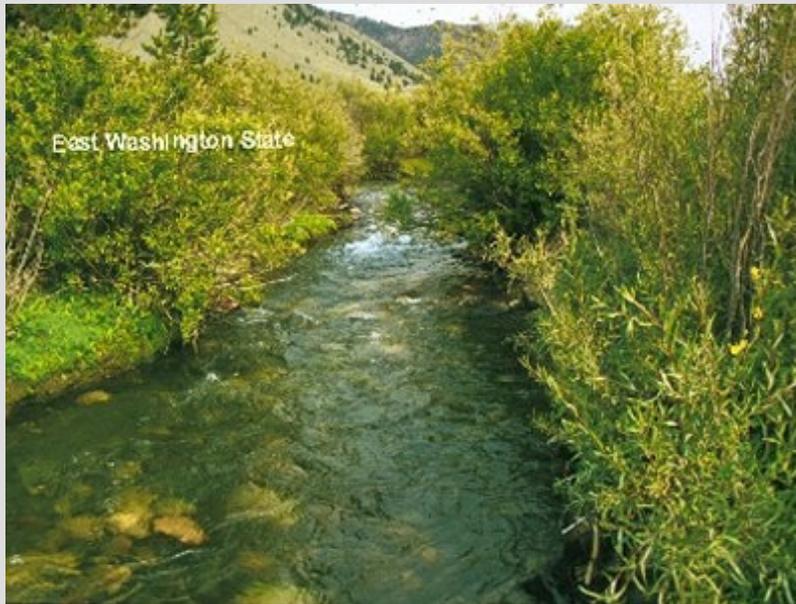
- Provides water quality

Functions of Riparian-Wetland Areas



- Traps sediment

Functions of Riparian-Wetland Areas



- Builds and maintains streambanks

Functions of Riparian-Wetland Areas



- Enhance productivity and
- provides wildlife habitat



Evaluating the Health of Riparian- Wetland Areas

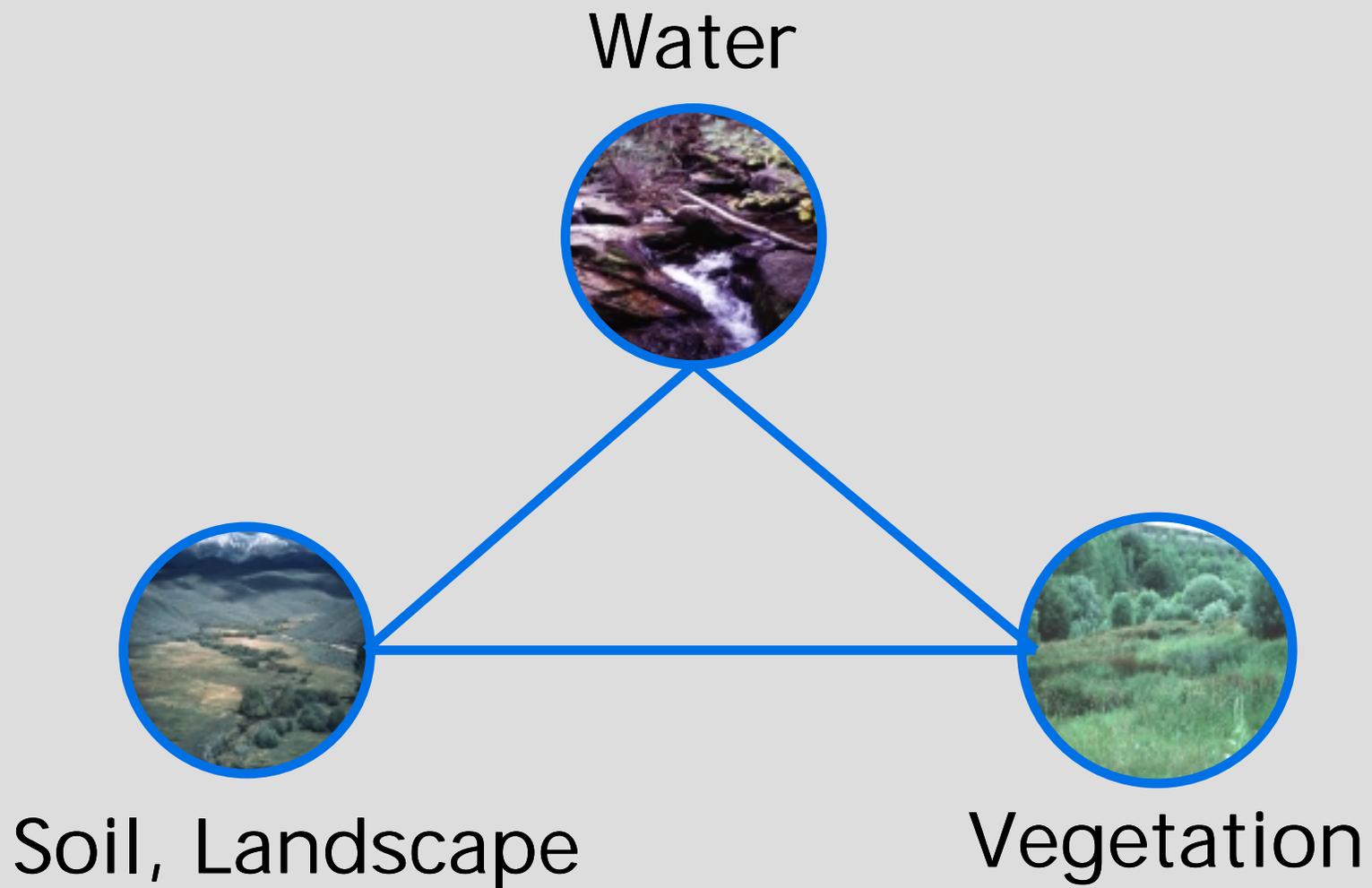








Riparian - Wetland Resources



Cooperative Riparian Road Stabilization

