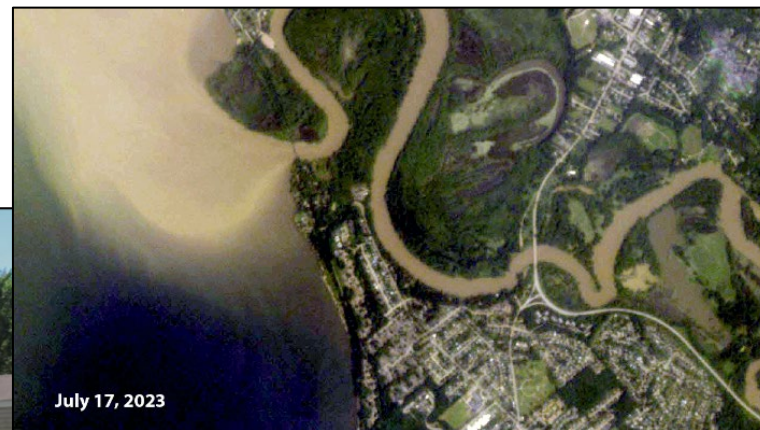
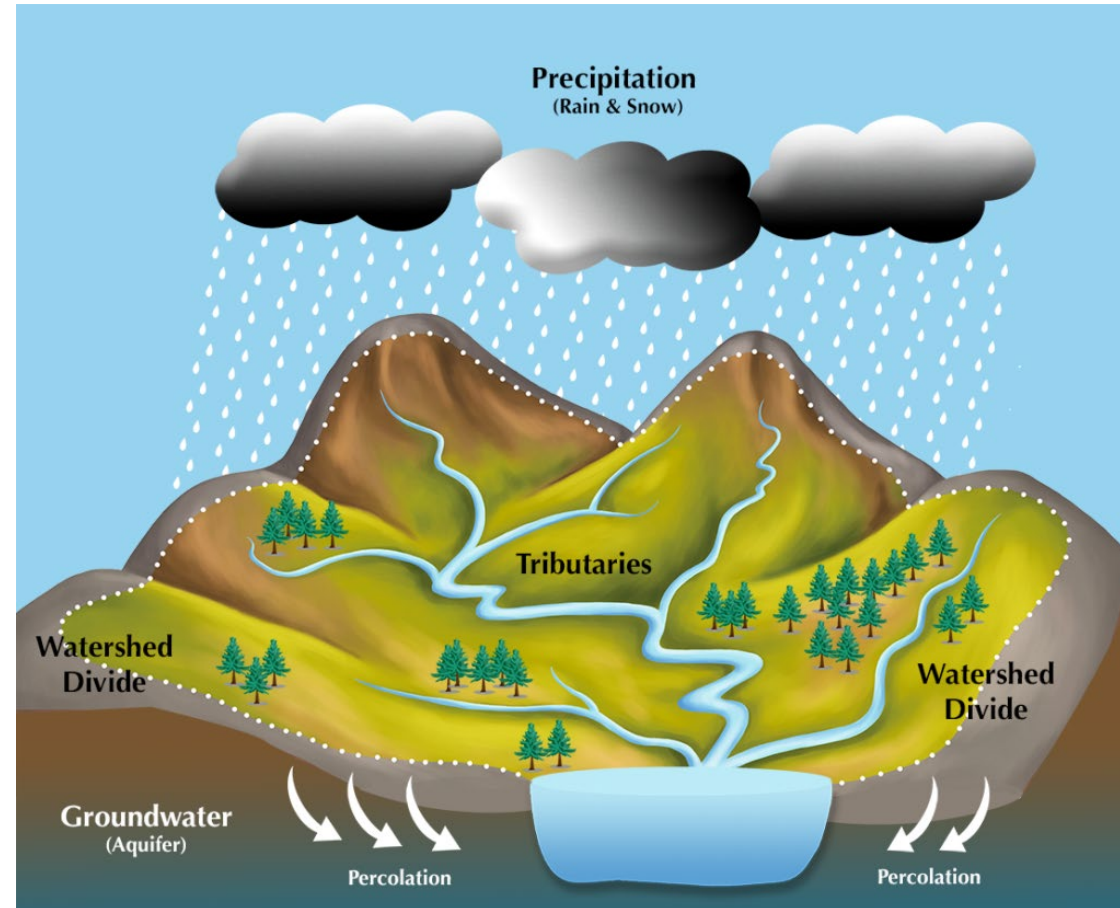


Understanding River Dynamics to Reduce Our Exposure to Flood Hazards

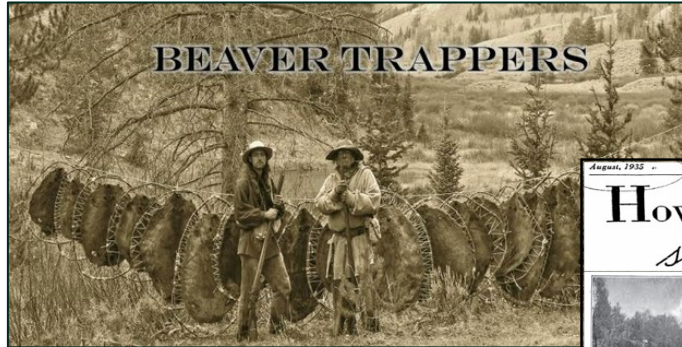


Shayne Jaquith
The Nature Conservancy

The Condition of the Lake is Largely Driven by the Condition of its Tributary Rivers




A Long History of Human Impacts



August, 1935 - AMERICAN FORESTS 365

How DYNAMITE streamlines streams



CROOKED STREAMS are a menace to life and crops in the areas bordering on their banks. The twisting and turning of the channel retards the flow and reduces the capacity of the stream to handle large volumes of water. Floods result. Crops are ruined.

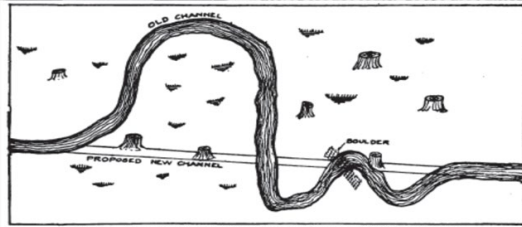
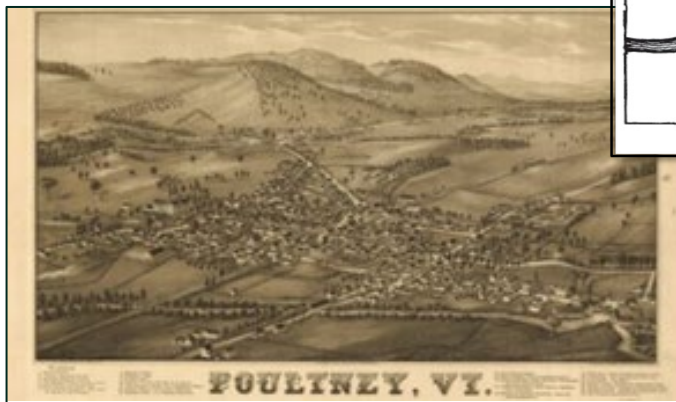
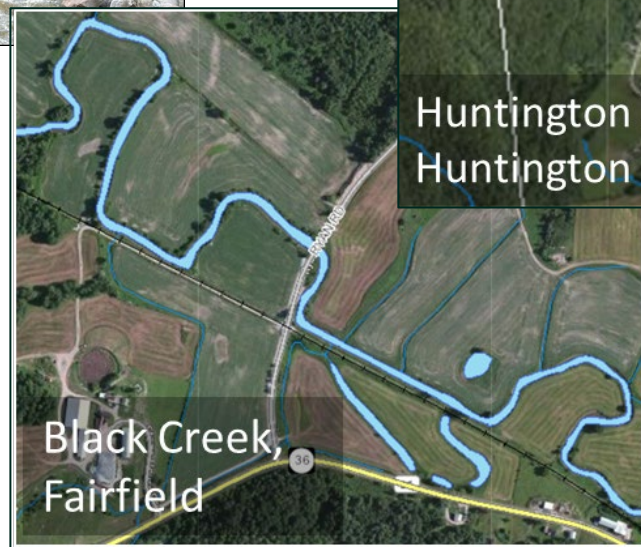
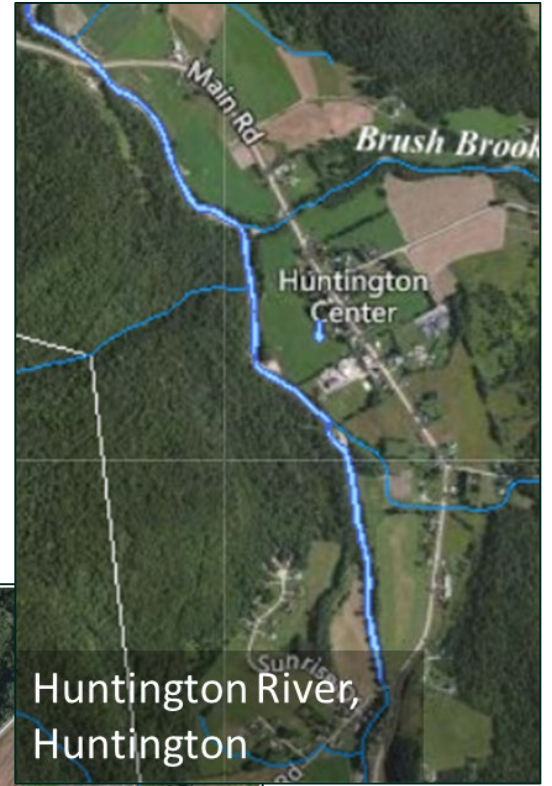
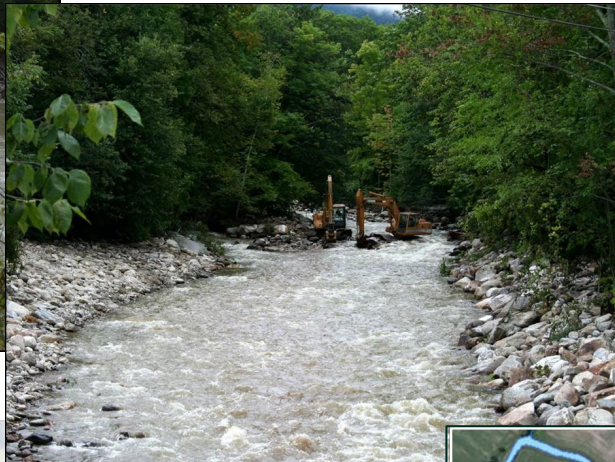


FIG. 54. DIAGRAM OF STREAM TROUBLES THAT MAY BE CORRECTED BY BLASTING.

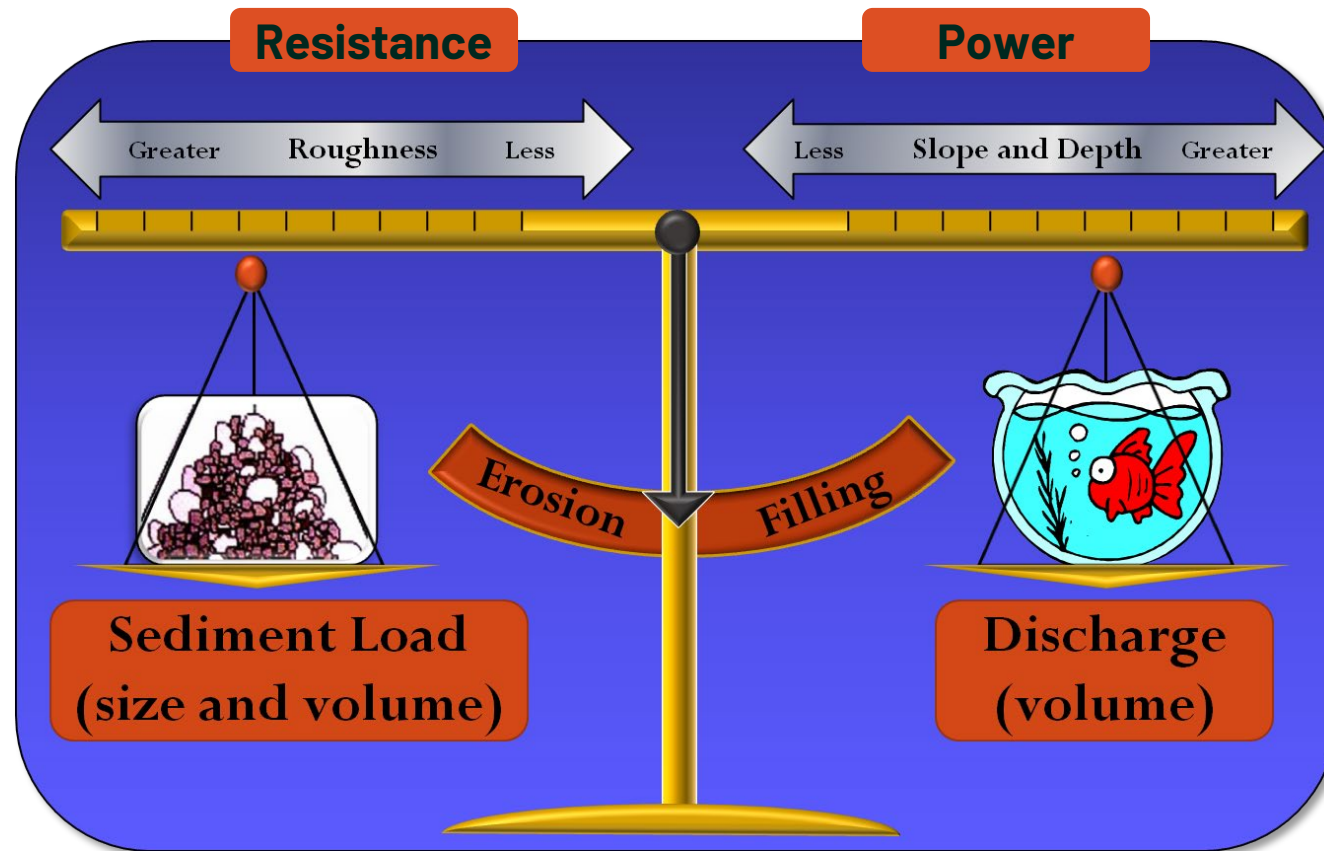
The diagram shows a meandering 'OLD CHANNEL' with several sharp turns. A straighter 'PROPOSED NEW CHANNEL' is shown below it, with arrows indicating the path of water flow. Small figures of people and trees are scattered along the banks of both channels to illustrate the impact of the stream's path.



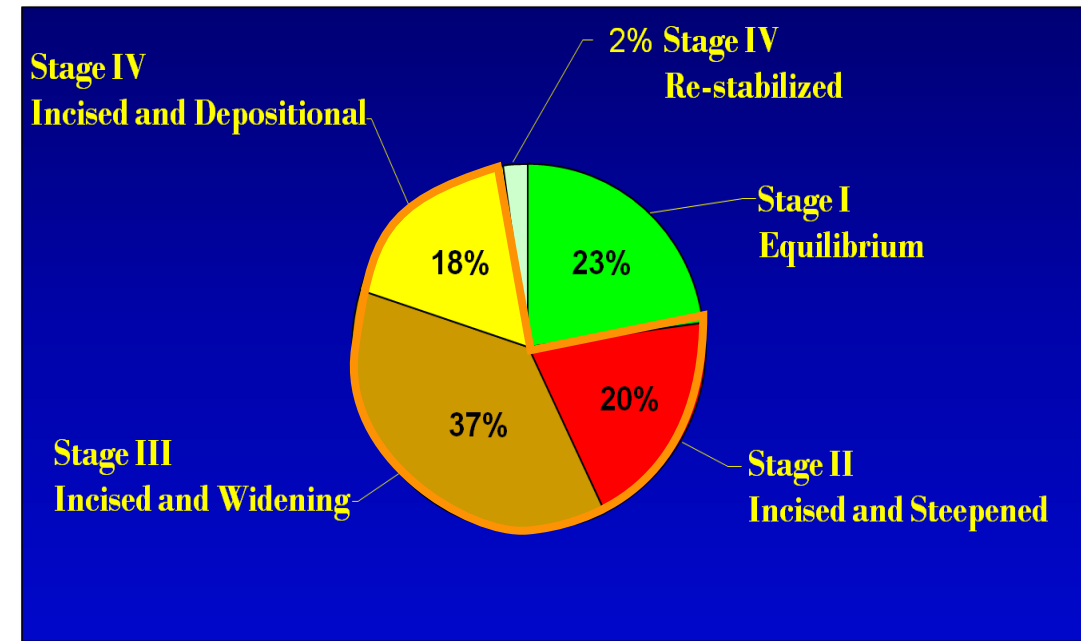
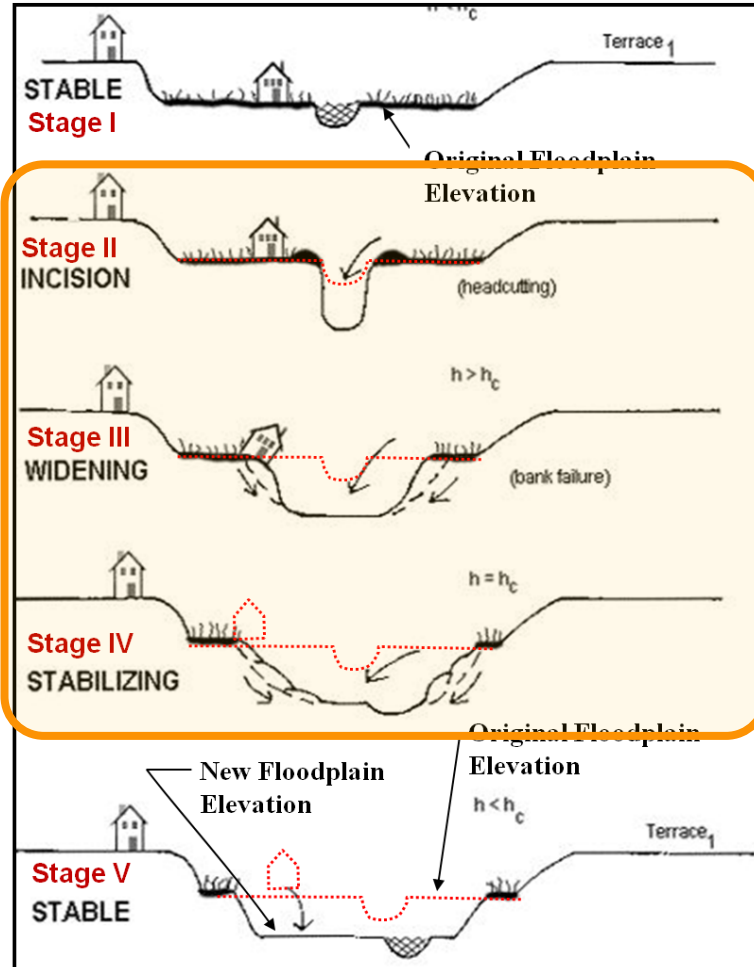
Dredging Berming and Armoring to Keep the Channel out of the Way and the Water in the Channel



River Equilibrium



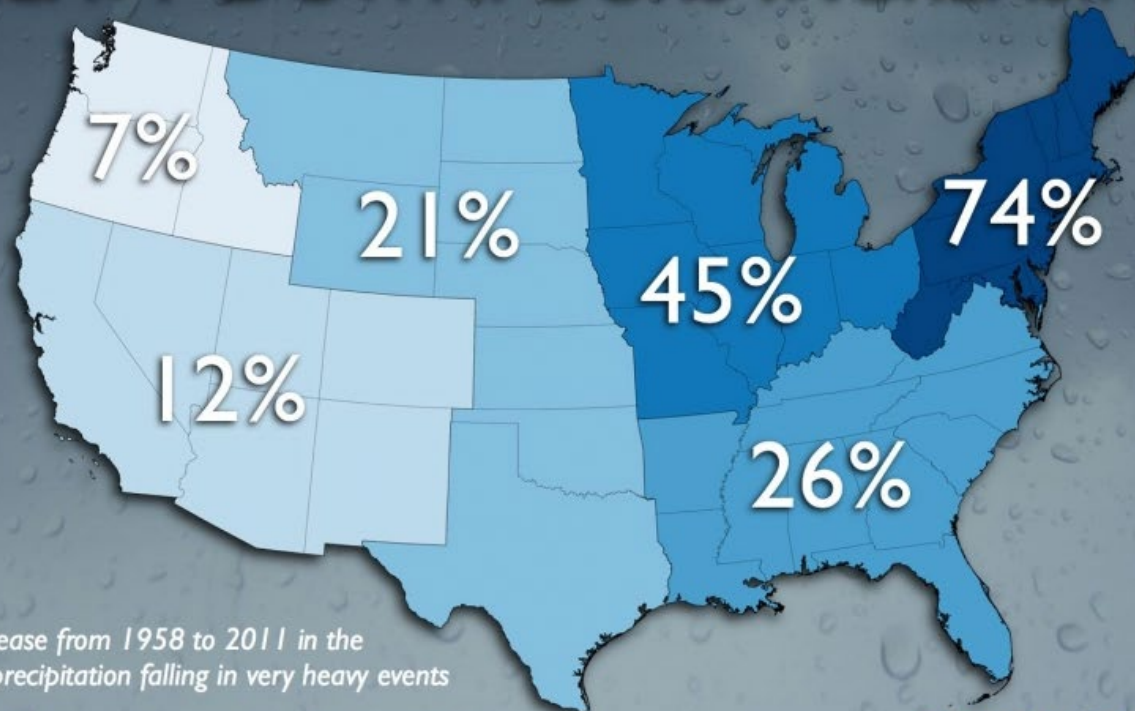
Channel Evolution



- **5,000 river miles assessed.**
- **75% undergoing channel evolution.**

Precipitation Trends

HEAVY DOWNPOURS INCREASING



Percent increase from 1958 to 2011 in the amount of precipitation falling in very heavy events

Source: Kenneth Kunkel, Cooperative Institute for Climate and Satellites, North Carolina State University and NOAA NCDC

CLIMATE  CENTRAL

Science News

from research organizations

Extreme precipitation in Northeast US to increase 52% by the end of the century

Date: May 30, 2023

Source: Dartmouth College

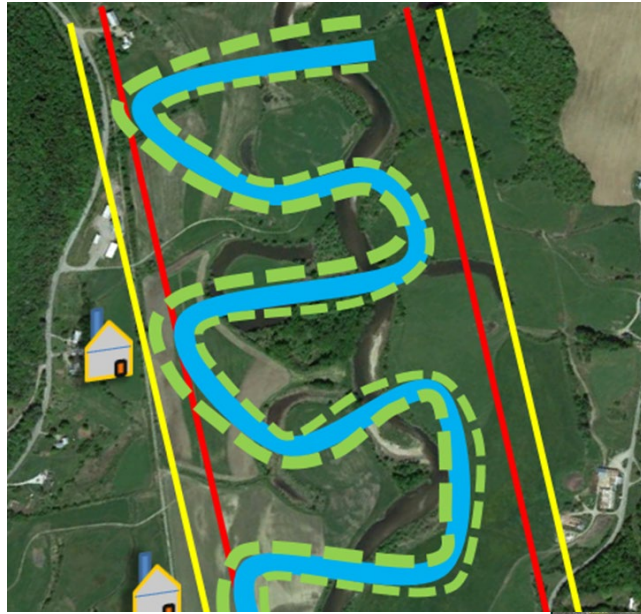
Summary: With a warmer climate creating more humid conditions in the Northeast, extreme precipitation events -- defined as about 1.5 or more inches of heavy rainfall or melted snowfall in a day -- are projected to increase in the Northeast by 52% by the end of the century, according to a new study.

Share: [f](#) [t](#) [p](#) [in](#) [✉](#)

Property damages from flooding in Vermont are calculated to exceed \$5.2 billion over the next 100 years.

-UVM Gund Institute

Solutions

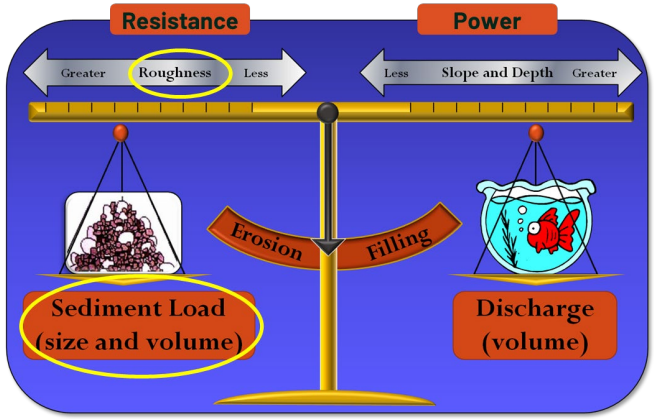


Vermont's Flood Safety Act: Limiting Development in River Corridors

River Corridors: the area on either side of the river where we expect the channel to adjust over time.



Riverscape Restoration: The Balance by Adding Large Wood





Storing Fine Sediment and Nutrients



Sediment Storage	
Sediment per site (yd ³)	9.9
Sediment per mile (yd ³ /mi)	422
Total Sediment (yd ³)	15,031

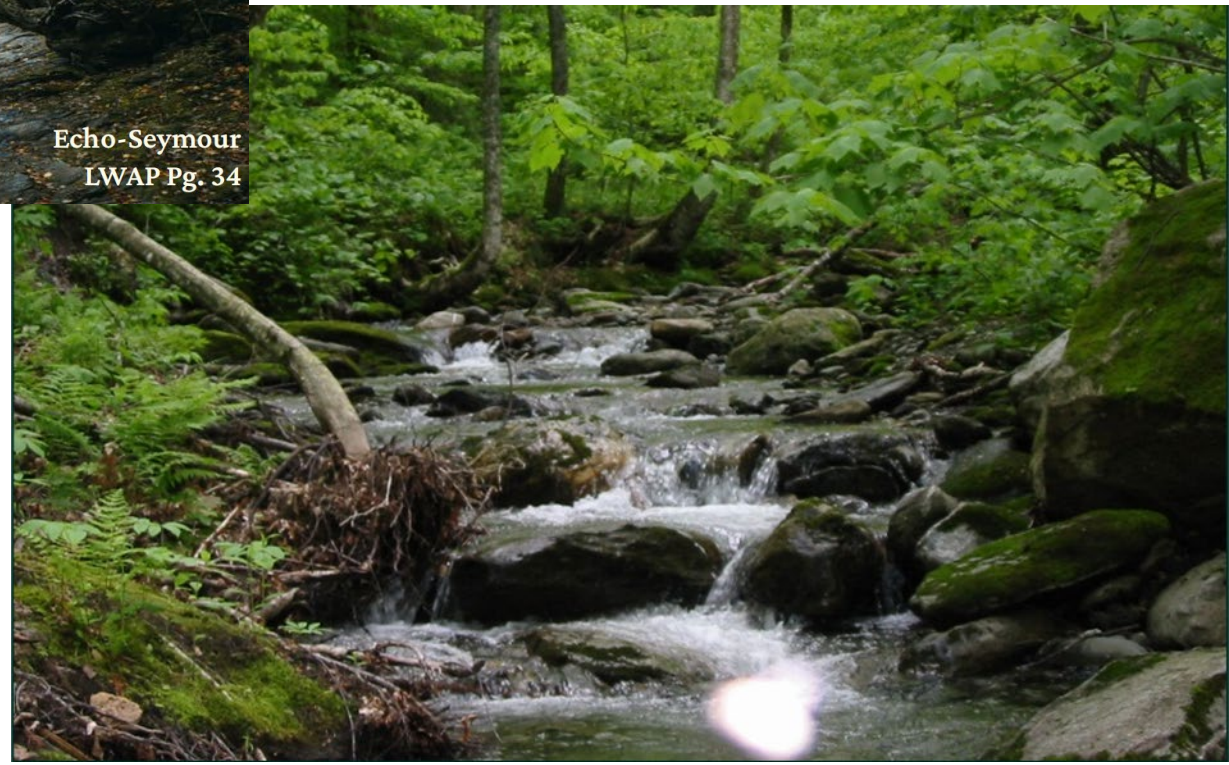
Grand Total = 1,493 dump trucks



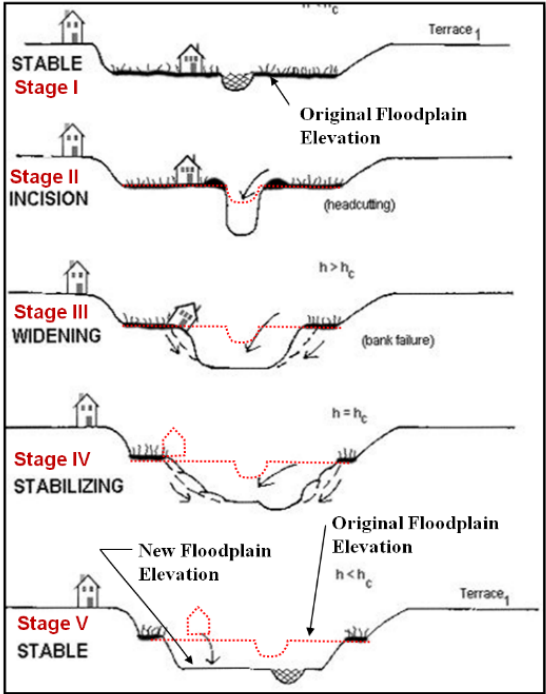
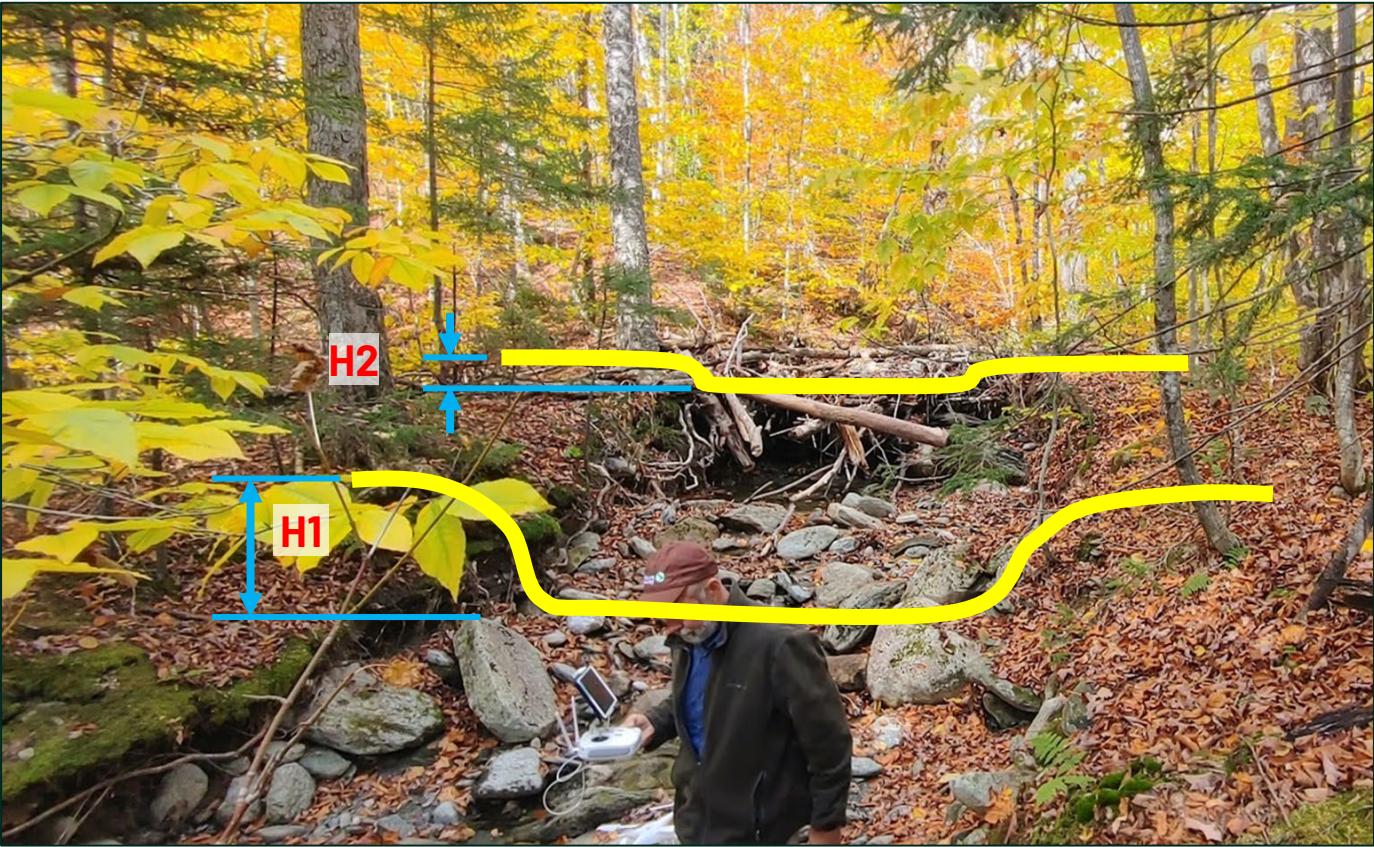
Streams & Storms

"The majority of stream miles in the Echo-Seymour Lakes watershed are intermittent or ephemeral flowing and run through high-gradient, forested catchments. While forest canopies help to intercept and infiltrate precipitation and reduce runoff compared to impervious surfaces, many of these catchments are underlain by heavy soils that have poor infiltration capacities and high runoff coefficients. As such, small streams that drain to each lake tend to be very 'flashy' during rain events - particularly during summer thunderstorms..."

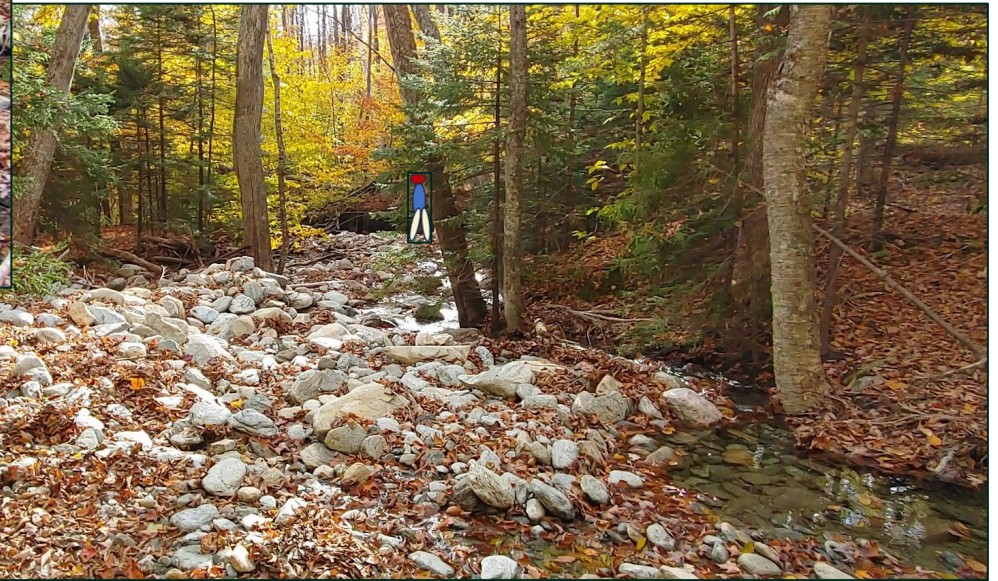
Echo-Seymour
LWAP Pg. 34



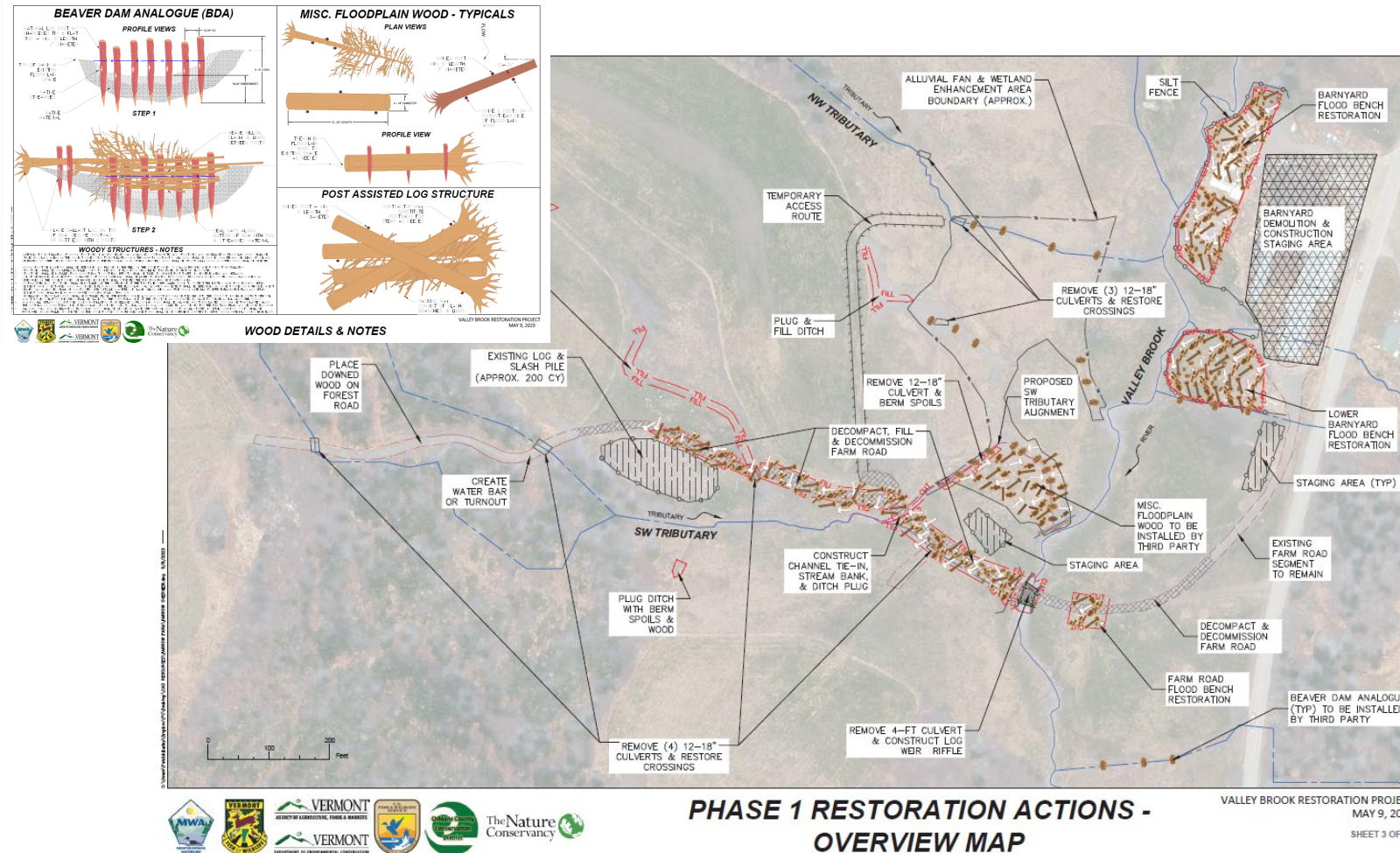
Reversing Channel Evolution



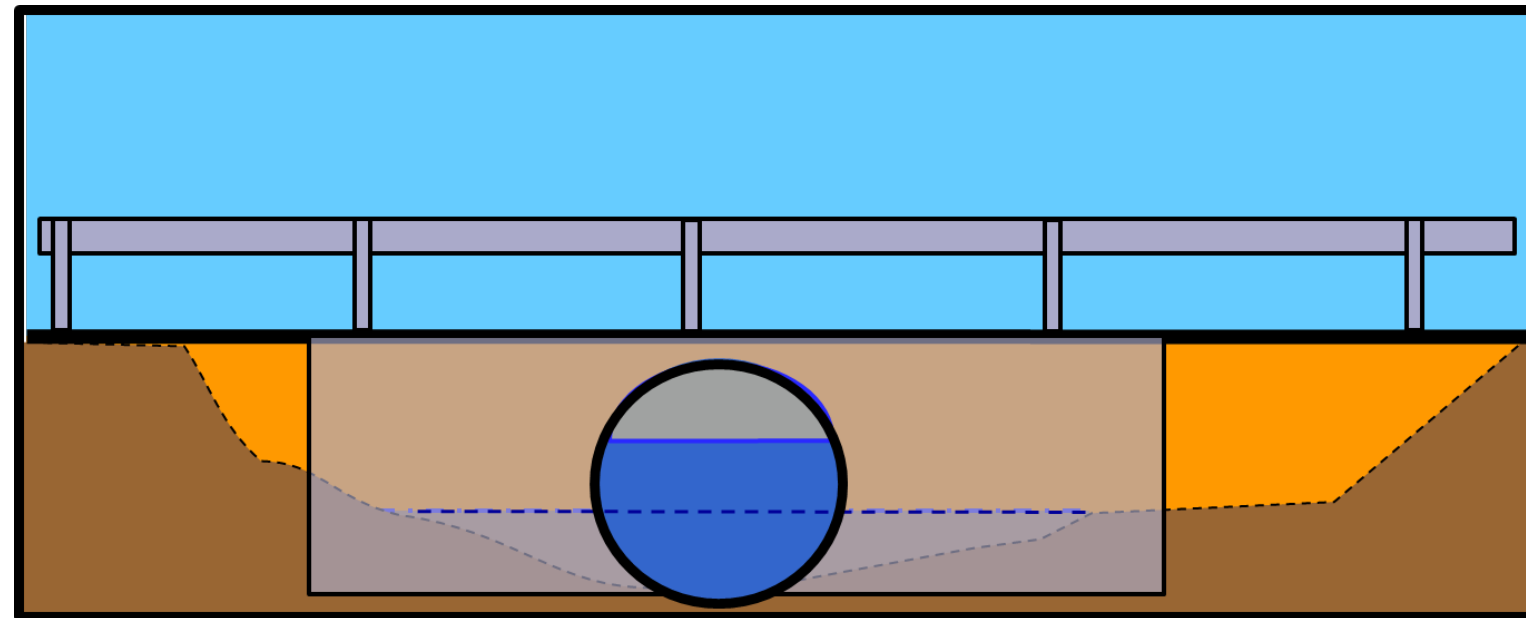
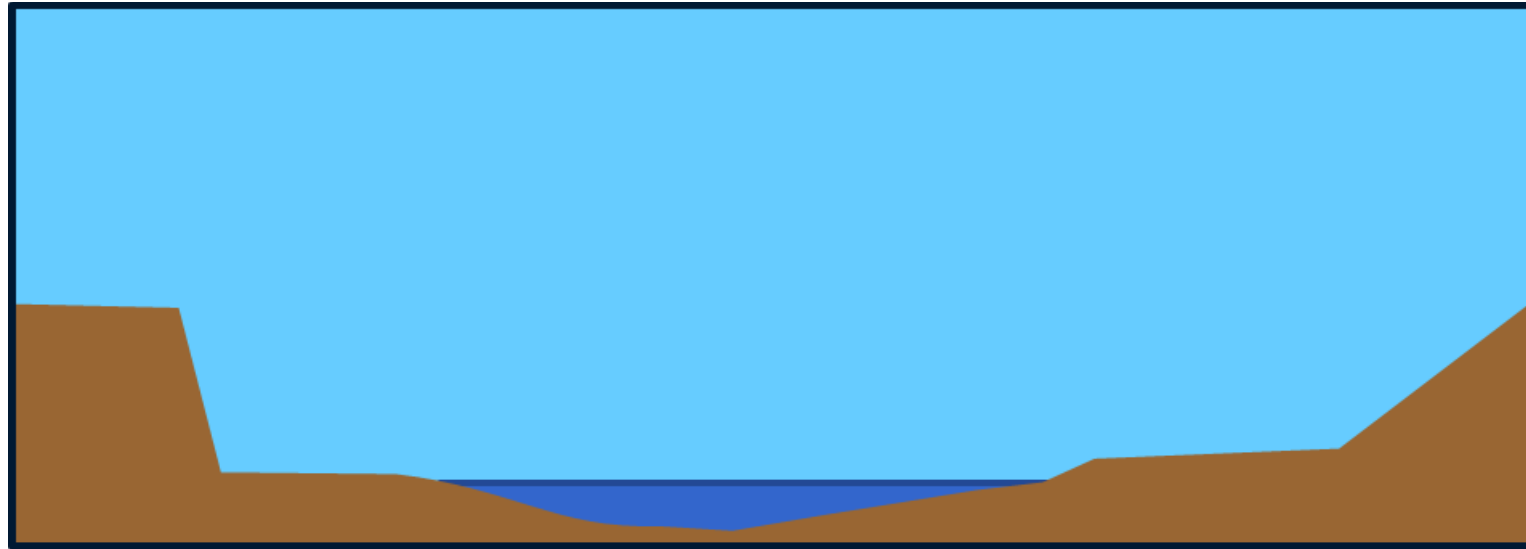
Reversing Channel Evolution Storing Sediment and Reconnecting the Channel to the Floodplain



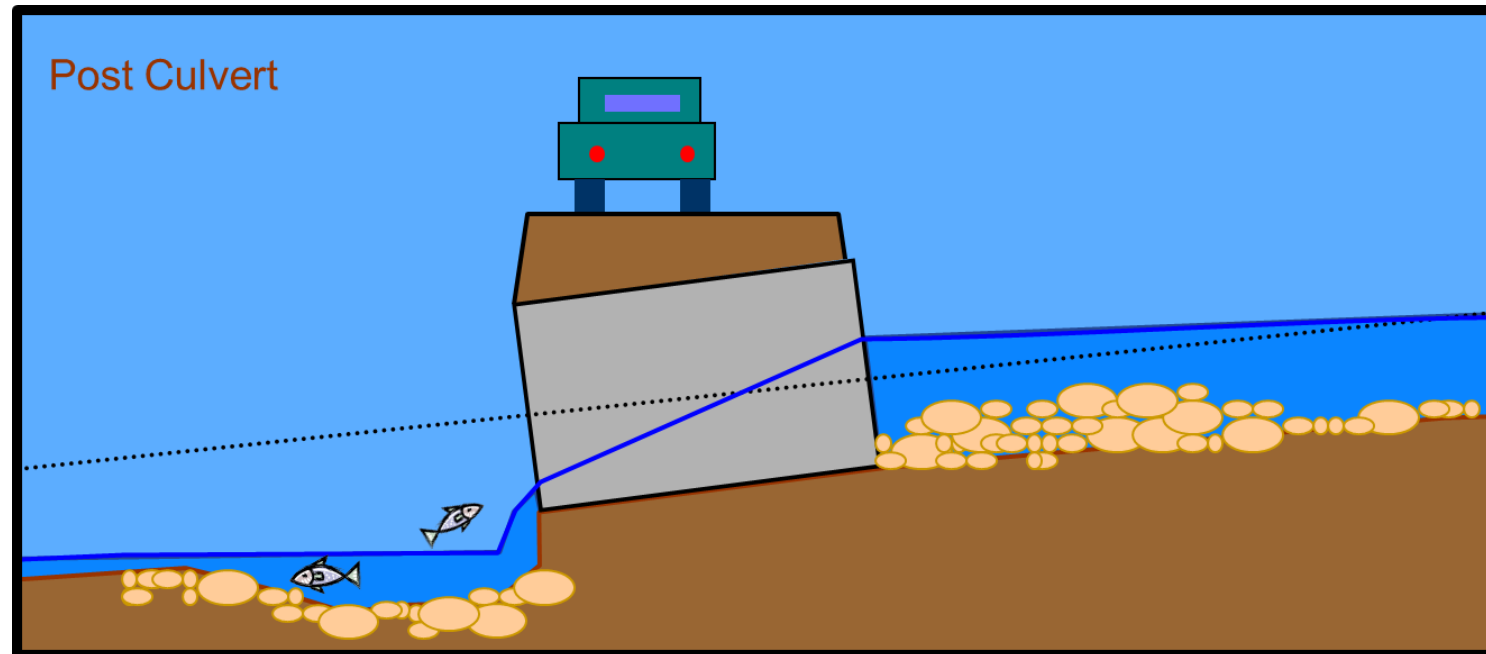
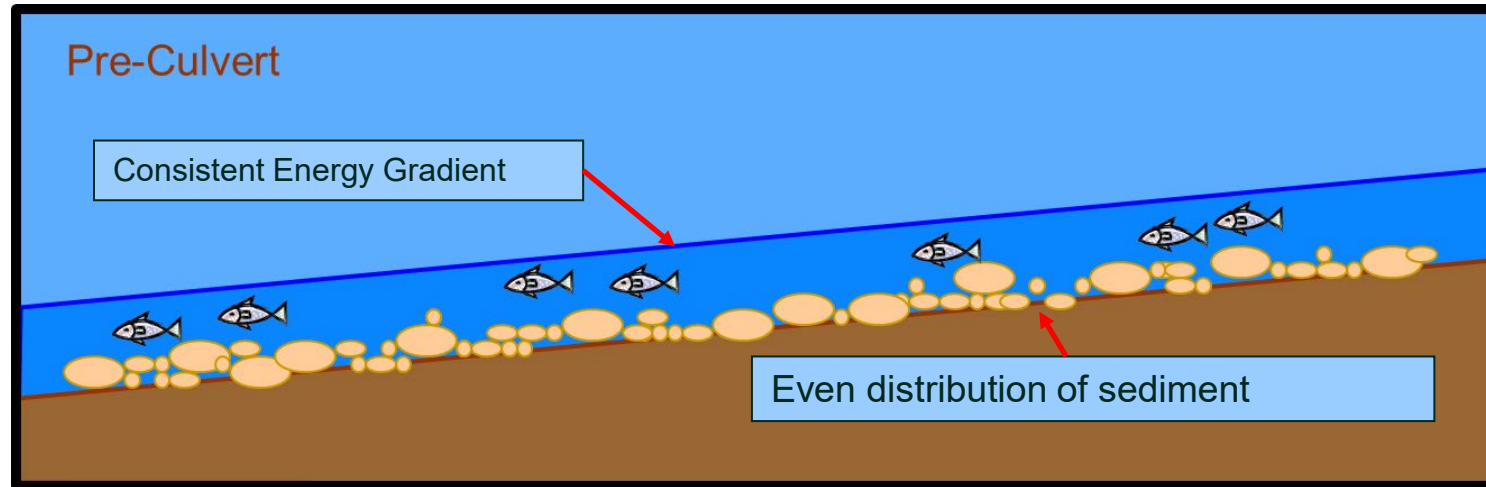
Valley Brook Restoration



Importance of Appropriately Sized Culverts



Importance of Appropriately Sized Culverts



Understanding River Dynamics to Reduce Our Exposure to Flood Hazards

