

# Re-thinking restoration

A photograph of a narrow stream flowing through a lush green wetland. The water is dark and reflects the sky. On the right side of the stream, there is a large, rustic structure made of sticks and brushwood, built across the stream. The structure appears to be a natural barrier or a small dam. The surrounding vegetation is dense and green, with some taller grasses on the left bank. The overall scene is a natural, undisturbed wetland environment.

**Mimicking resilience processes**

**Jeff Burrell  
Northern Rockies Program Director  
Wildlife Conservation Society**

# Restoring what to what?

Restoration in the purest sense is often associated with returning a stream to a pristine or to pre-disturbanced condition.

Since the sediment and flow regime, as well as many other variables, have been significantly altered in the watershed, returning a stream to a pristine condition is often not possible. **Restoration** as used in this paper is associated with *restoring natural function, resilience and biological condition.*

# Passive? Active?

Passive

Active



Restore resilience OR be resilience??

# What's in a name?

- Artificial debris jam
- Brush and/or rock weir
- Beaver dam mimic structure (BDMS)
- Beaver dam analog structure (BDAS)
- Beaver dam support structure (BDSS)
- Etc.



**“Let the Water Do the Work”**

**Concepts and Fundamentals**

**Bill Zeedyk**

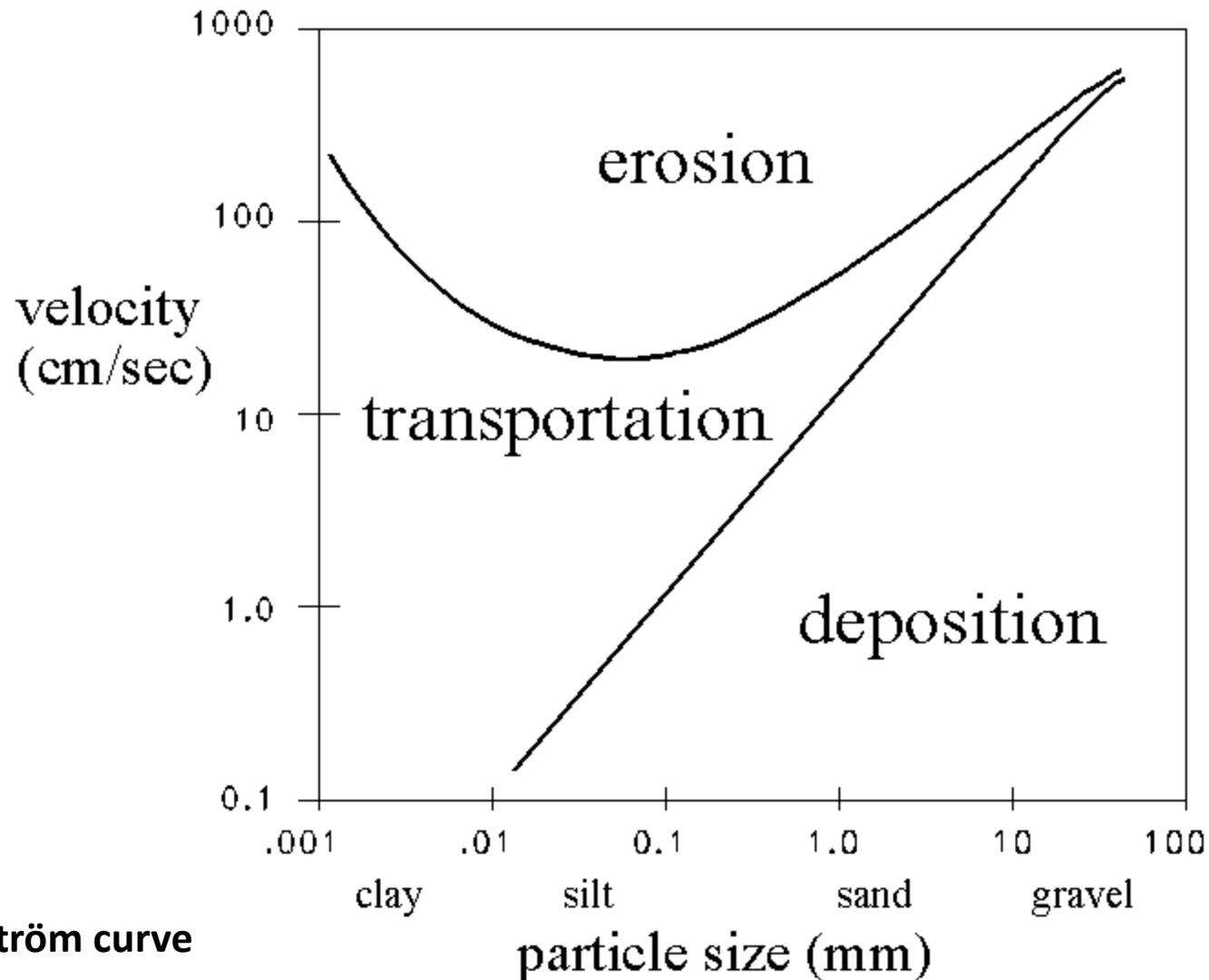
The Quivira Coalition's  
2009 Water Symposium

# ‘Let Water Do the Work’

Using structures to  
change stream-flow speed  
and direction



# Water velocity and sediment size



Hjulström curve

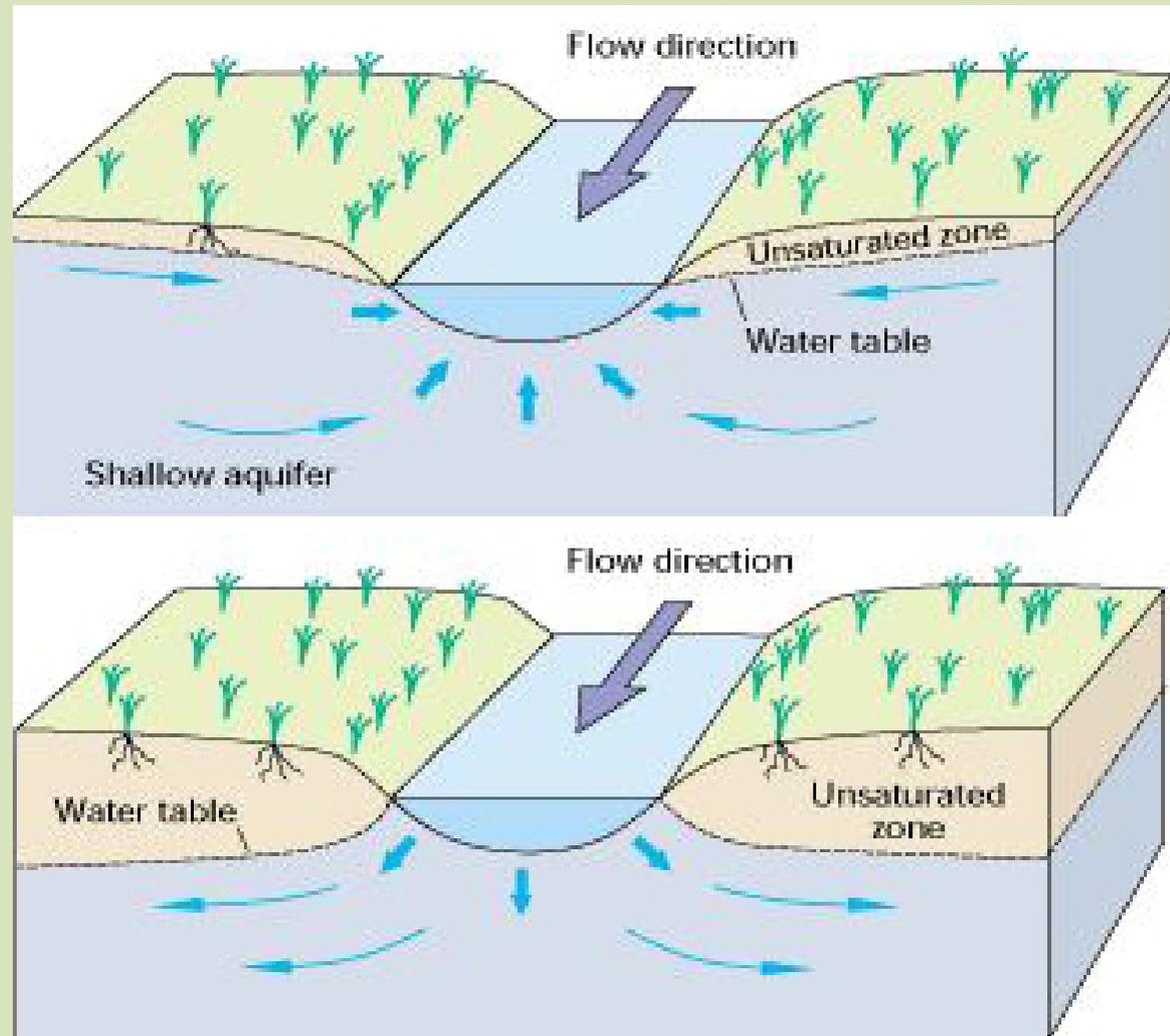
**Speed and direction control:**

**Speed control: deposition**



# Considerations

- Substrate – the puzzle
  - Gaining
  - Losing



# Considerations

- Substrate – gaining insights
  - Dig
  - Survey
  - Observe



# Considerations

- Channel dimensions and flow



Less when more

Slow

Fast



Tight

Loose



# Considerations

- Available material
  - Willows
  - Branches and deadfall
  - Cattails and reeds
  - Rocks???



# Bundle



A **fascine** /fə'si:n/:  
a rough bundle of  
brushwood

# Examples

- Incised stream
  - Full span
  - Spurs



# Examples

- Induced meandering



# Examples

- Over-broadened
  - Spurs



# Examples

- Head-cutting
  - Full span
  - Secondary



# Examples

- Conifer encroachment
  - Full span



# Monitoring



# Monitoring



# Mimic structures: advantages

- Effective
- Efficient = cheap
- Minimal disturbance
- Incremental: high benefit/problem ratio



# Questions?

