Reducing Sediment Loads and Restoring Streams

When Nature Controls (Most) of the Cards

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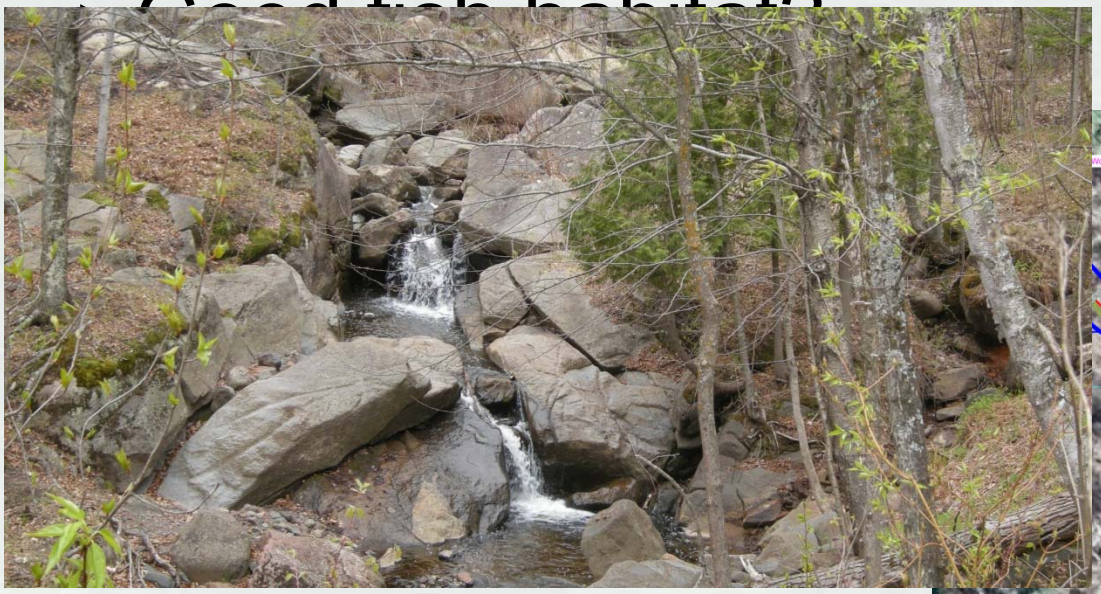
BUILDING STRONG®

Picture a healthy, restored stream

Are you picturing the same thing as the people sitting next to you?

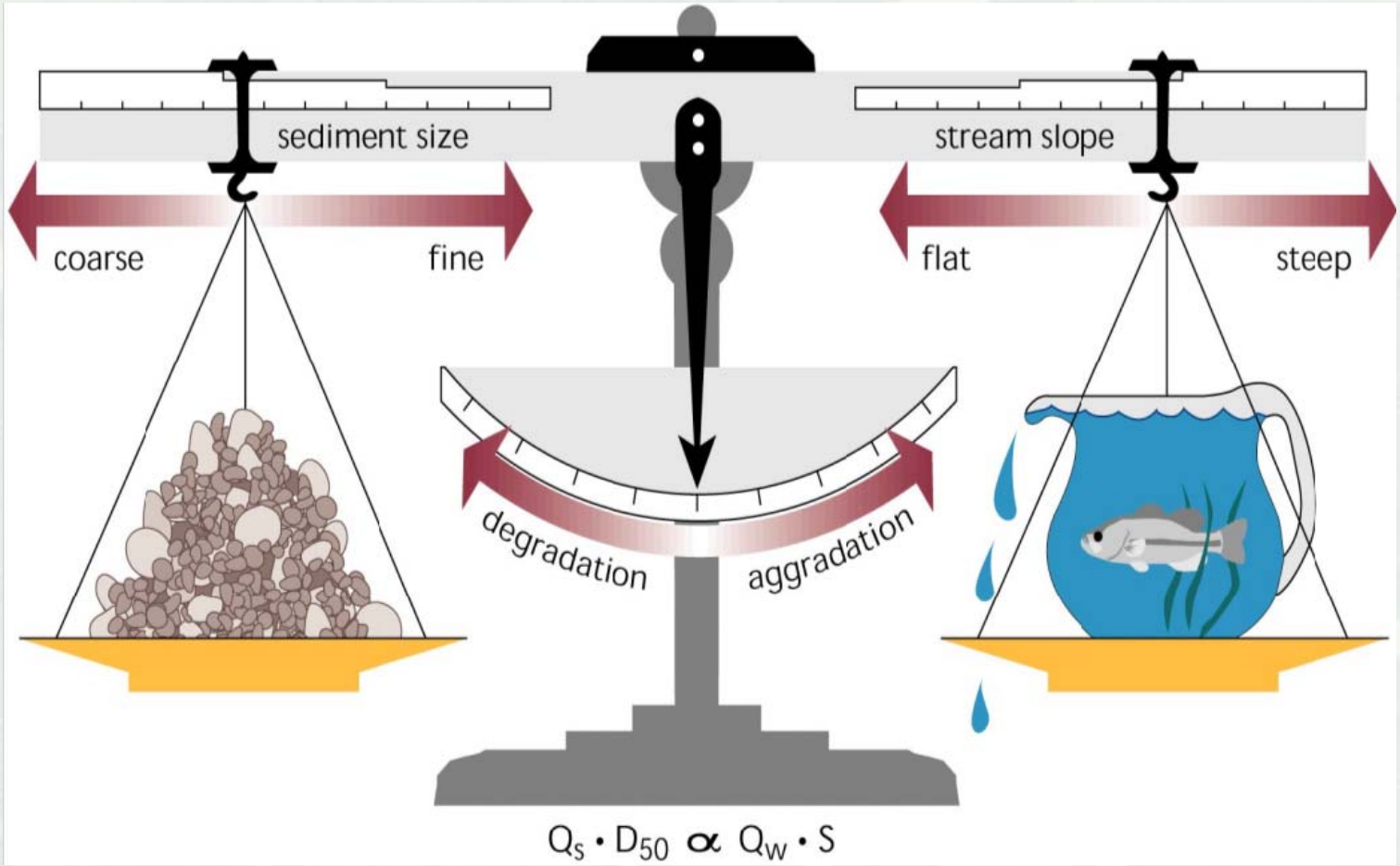
- ►Low sediment?
- ►Good fish habitat?



Restoration Goals

- Many possible goals for restoration
- Goals will affect the choice of sites and methods
- Are the goals feasible?
- Unintended Consequences
  - ►Fine sediments may be bad for fish, but…

Sediment Requires Balance



Historical Perspective

Ontonagon River, MI

Historical Observations

Ontonagon River, MI

Achievable Goals?

Nemadji River, MN & WI

- 433 square miles, with ~1/3 comprised of glacial till and Red Clay
- Slumping clay banks throughout the watershed
  - ~98% of sediment yield
- Heavily forested
- Limited access

Source: geocaching.com

What questions *can* we answer?

Nemadji River, MN & Wi

- Traditional bank stabilization may not be feasible, but…
  - ► Can we reduce the peak flows through other work in the watershed enough to affect the rate of bank failure?
  - ► How significant were the bank failures prior to logging?
  - ► What if we let the bank failures happen but trap the sediment?

Things We *Can't* Control

Knowlton Creek, MN

- 2012 Flood produced a flow > 120% of the 100-year storm (USACE, 2013)
- Caused the failure of an already deteriorating railroad grade

Source: Dahl (June 2012)

Source: Dahl (July 2012)

2012 Flood & Culvert Failure

Knowlton Creek, MN

Source: Dahl (November 2013)

Source: Dahl (July 2012)

Think About Resiliency

Knowlton Creek, MN

- How might extreme events impact our work?
- Do we risk over-designing or can the design allow for faster recovery?
- Not *just* storms:
  - Lake levels
  - Glacial rebound

Summary

- Define common goals
- Acknowledge constraints
- Figure out what *can* be accomplished
- Build in resiliency

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