

How Do Logjams Fail?

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Tracy Drury, PE



ANCHOR
ENVIRONMENTAL, L.L.C.

Engineered Log Jam: Definition

➤ Design Premise

- Emulate naturally occurring wood structure in rivers

➤ Construction Materials

- Large wood compiled to function as a unit

➤ Ballast Materials

- Natural local riverbed

Failure?

- Expectations
 - What were the pre project expectations
- Performance
 - Did the project perform as intended
- Stability
 - Did the project elements stay in place

Hoh River As-built conditions



Post flood conditions



Failure Mechanism

Potential unraveling of individual members

Failure?



Scour beneath ELJ

or

Dislodging from bank

No Failure?



Potential flanking of the ELJ

Stillaguamish River As-built conditions

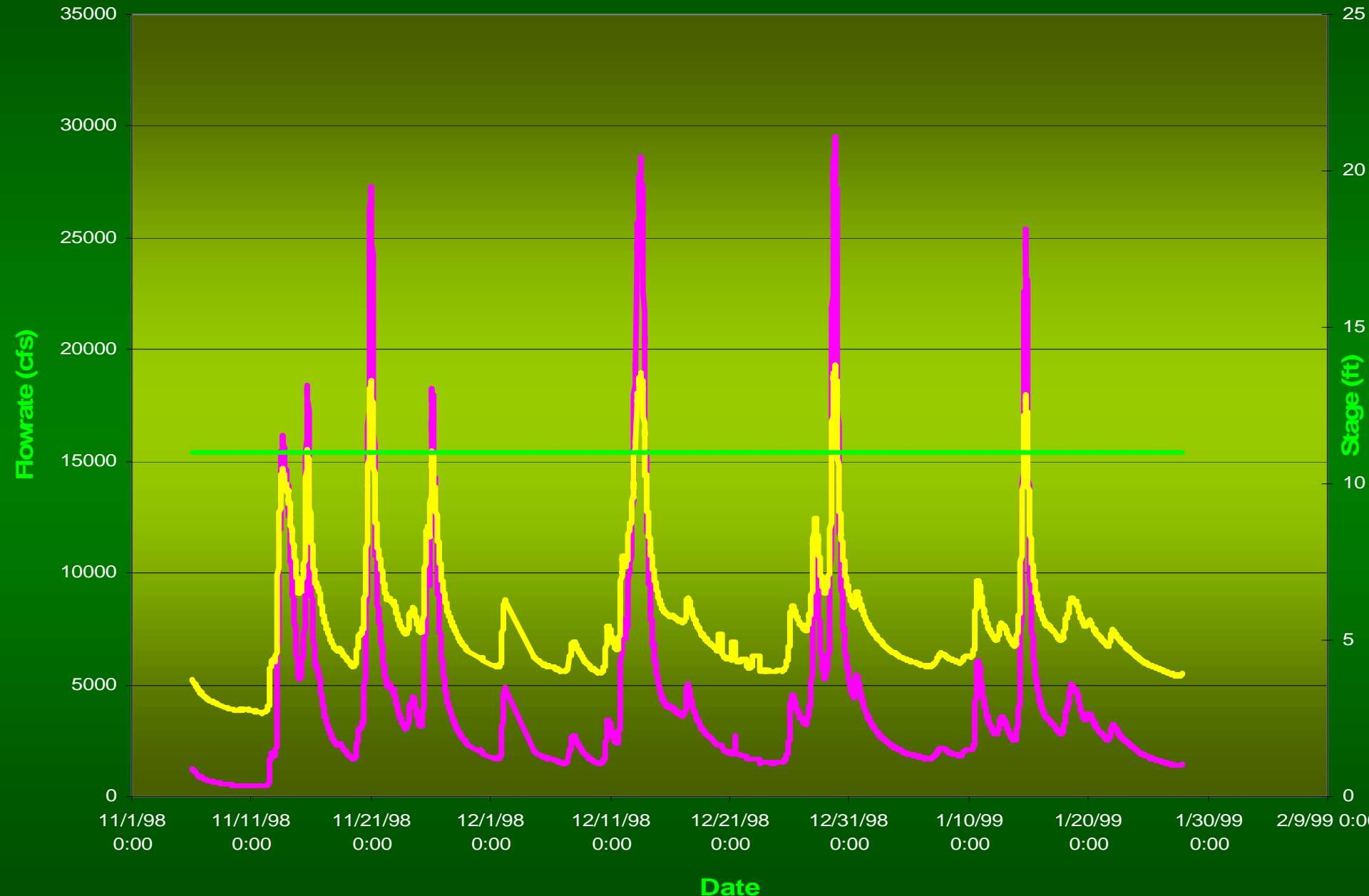


Flood conditions



11/15/20

Flow Regime For North Fork Stillaguamish 11/98 - 1/99



A photograph of a riverbank. In the foreground, the water is clear and shallow, revealing a rocky riverbed. A large pile of weathered, grey driftwood is stacked along the bank. Behind the driftwood, a dense forest of green trees rises up the bank. The sky is not clearly visible, appearing as a bright, overcast area at the top of the frame.

Failure?

or

No Failure?







How Do Logjams Fail?

Expectations

Misunderstanding about expectations

Performance

Physical and Biological responses

Stability

Founding the structure is the key

What Can We Do About It



Innovate



Try Something New







Photo Courtesy of Herrera Environmental Consultants



Take Home Messages

- Decade of implementation has produced valuable lessons learned
- Not all Engineered Log Jams are created equally
- Can be constructed with all natural materials
- Incorporating other materials and techniques can improve performance and lower costs

Long Live Wood in Rivers



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