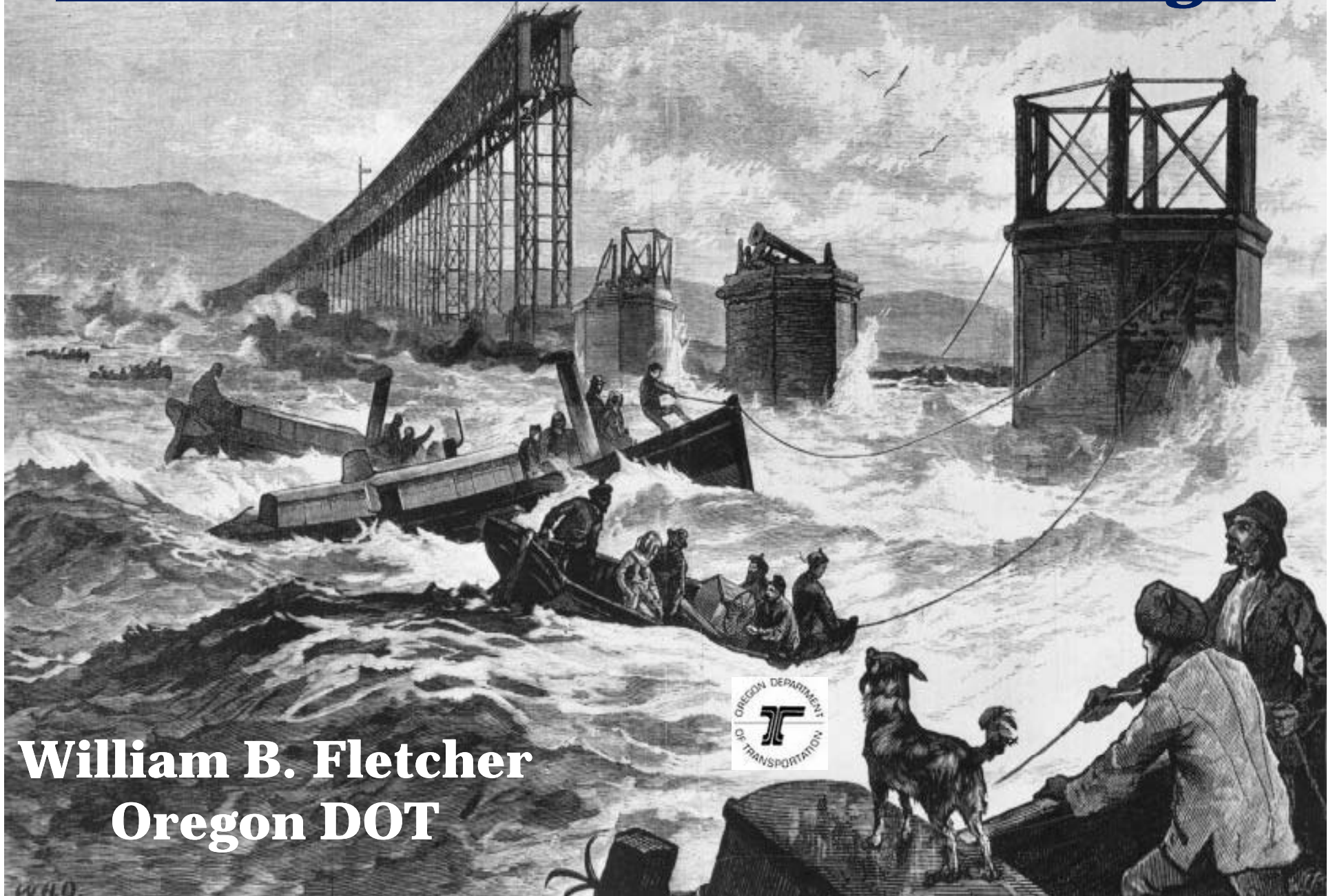


Like Water Under Troubled Bridges

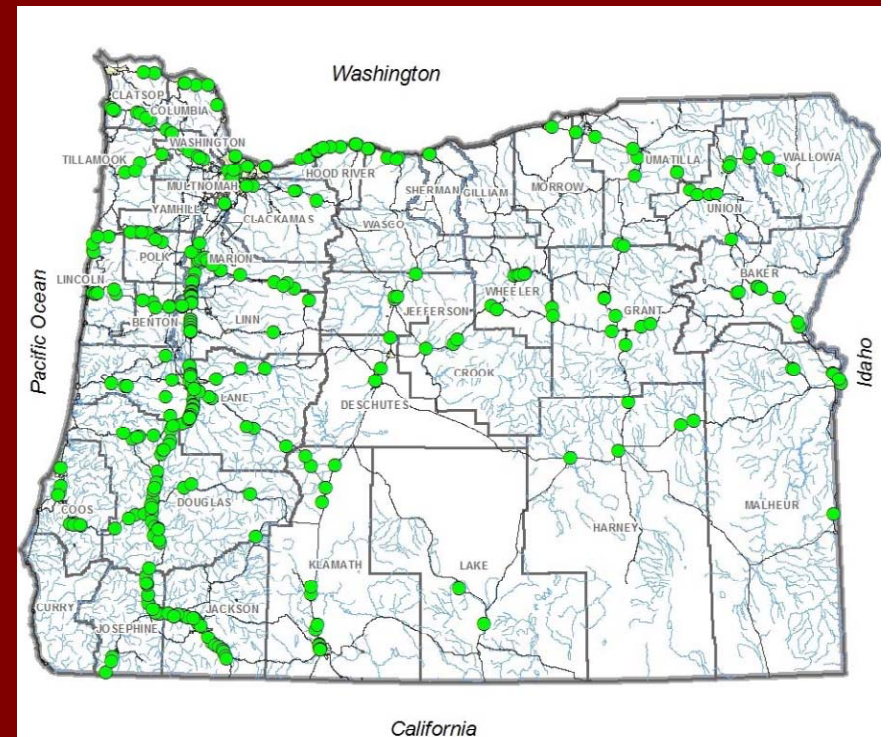


William B. Fletcher
Oregon DOT



The Bridge Crisis (AKA the Impetus)

- 365 Highway Bridges needed fixing, fast.
- Project by project permitting is slow, confusing and annoying for everyone:
Environmental goals were unclear and the outcome uncertain



Programmatic Permit Goals

- Environmental Protection and Uplift
- Certainty in Scope, Schedule and Budget
- Rapid Project Approval
- Financial and Engineering Feasibility



Environmental Performance Standards

- **Focus on the desired outcome**
- Have clear, easy to assess criteria, but
- Allow for other approaches
- Be achievable for at least 80% of the projects
- Don't make “the perfect the enemy of the good”



Getting There

- Assemble the stakeholders and disciplines
- Clarify the issues
- Agree on purpose, goal and outcome
- Identify the elements
- Discuss, propose,
Discuss, counter-propose,
Discuss, decide



Reality Check

The Programmatic BO is for:

- An Existing Stream Crossing Structure
- A Single Point on the Stream
- A Defined Set of Projects
- For most, but not all bridge crossings

What is the Fluvial Performance Standard's Goal?

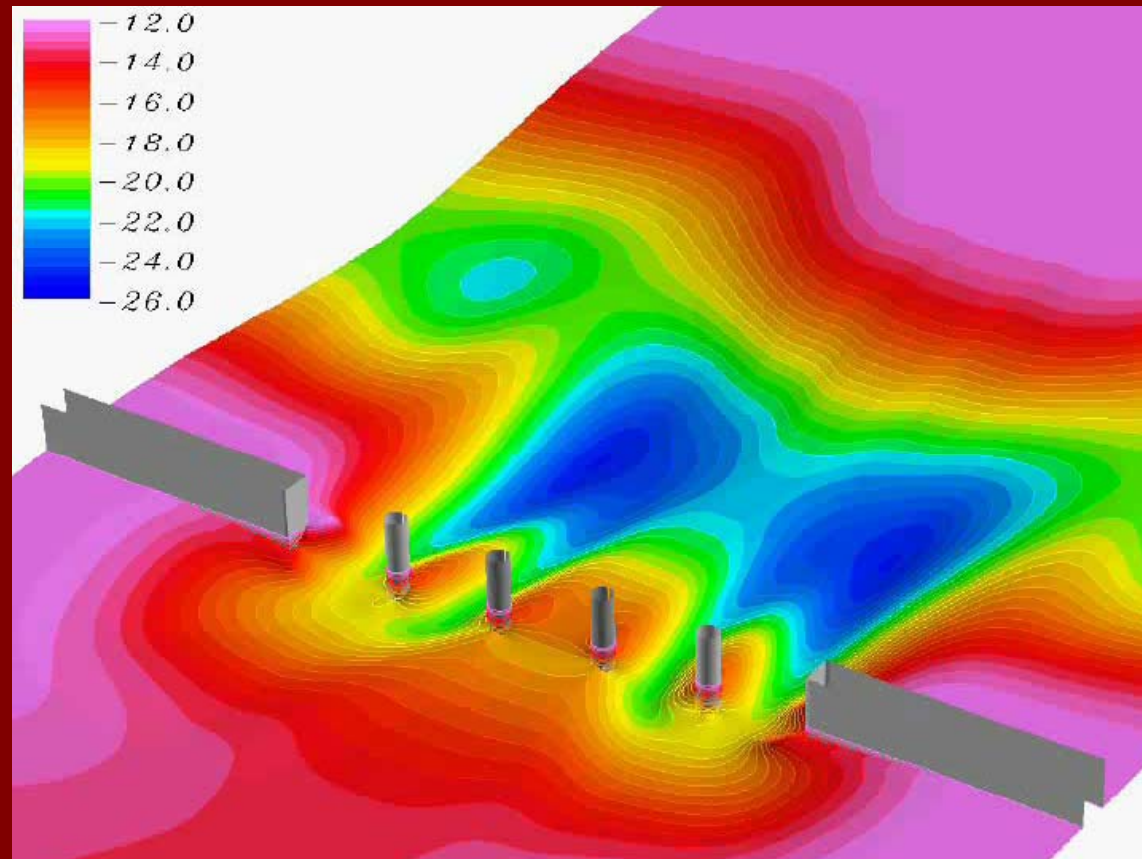
- Focus on the habitat, or the stream?



- Assumption: A “normally” functioning stream is good habitat for fish, so focus on the stream.
- A stream functions “normally” when it is not interacting with the bridge

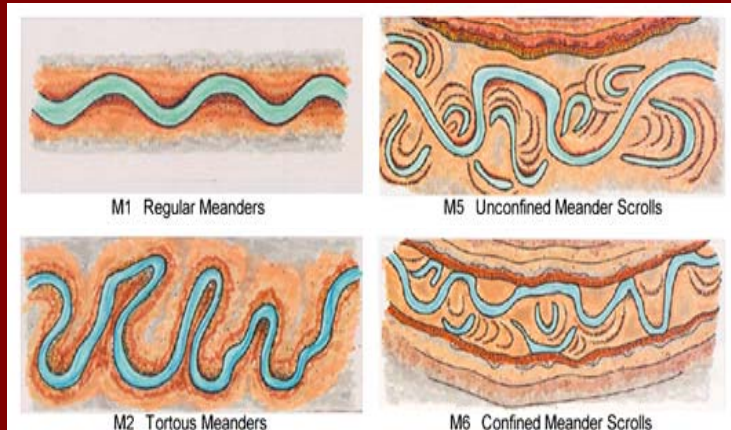
The OTIA III Fluvial Performance Standard

Allow normative physical processes within the stream-floodplain corridor.



“Normative Functions”

- Connectivity with the floodplain:
 - Normal flow paths and depths during common flood events
 - Allow some lateral movement of the channel
- Maintain sediment transport and debris movement for common events.
- Important habitat features (spawning beds, refuges) preserved.



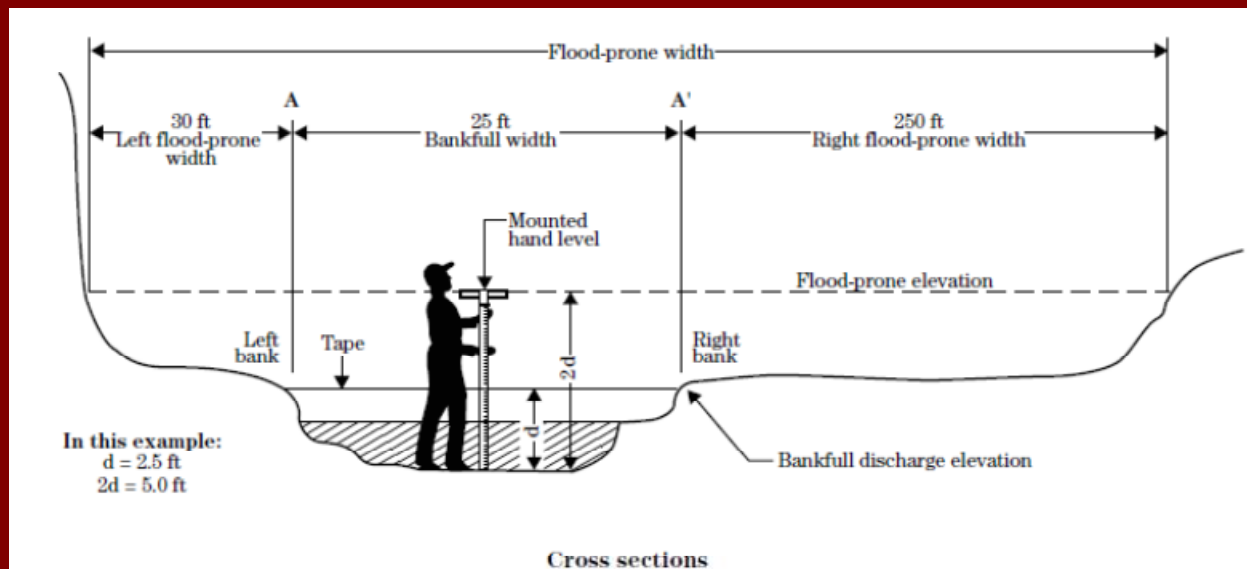
Span the Functional Floodplain

- What is the Functional Floodplain?
- Rosgen's "flood prone area" used to define the "Functional Floodplain"



The Functional Floodplain

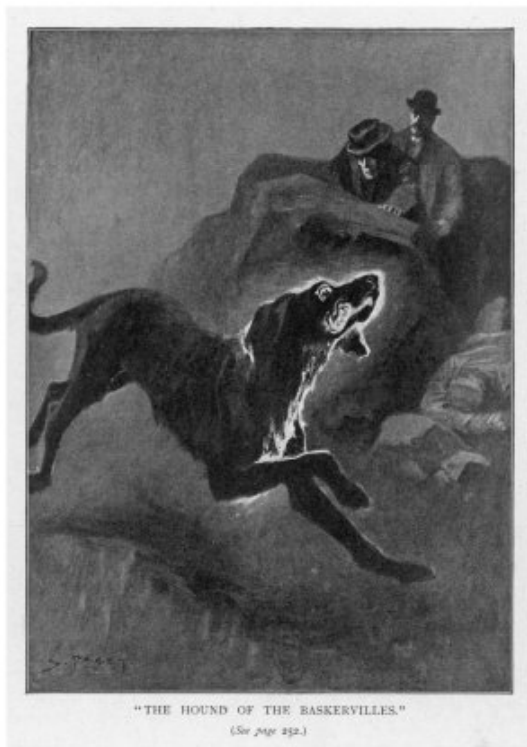
- 2.2 times the Bankfull Width if the Entrenchment Ratio is > 2.2
- or
- The width of the Floodprone area if the Entrenchment Ratio is < 2.2



Figures are not to scale

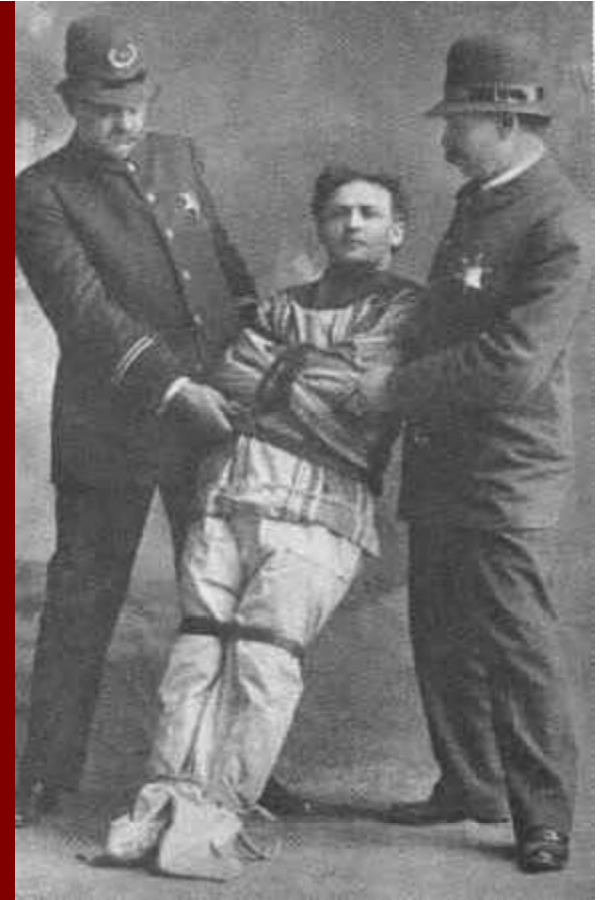
Riprap, the *Bête Noire*

- Riprap in-stream for existing bridges only
- Use soil bioengineering techniques
- Incorporate large wood in riprap if possible



Flexibility

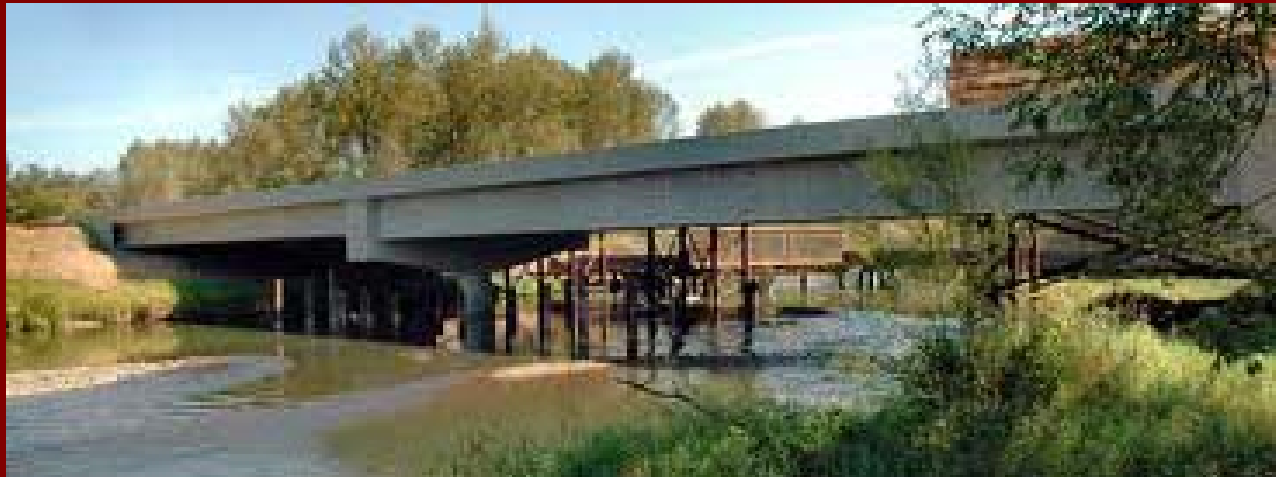
- Different approaches to reach the same goal
- Modify criteria based on the site
- Off-site mitigation specifically allowed in the Programmatic Biological Opinion



Testing the FPS

Practical, or will it break the bank?

- Looked at real bridges: most spanned the functional floodplain



OTIA III Outcome

- About half the bridges needed no enlargement
- Many streams already whacked, so the functional floodplain was narrower than 2.2 X bankfull.
- The opening is important, not the bridge length



The rest of ODOT meets the FPS

- No formal roll-out
- The FPS conditions get put in the BOs for non-OTIA III projects
- A draft appendix on the FPS for the ODOT Hydraulics Manual given the unfortunate title “Fluvial Design Method”



Bad Blood

- Confusion about the FPS and Programmatic Permits
- Fear of excess cost
- Concerns about restricted use of riprap
- Legacy of distrust and conflict
- Separation by a common language



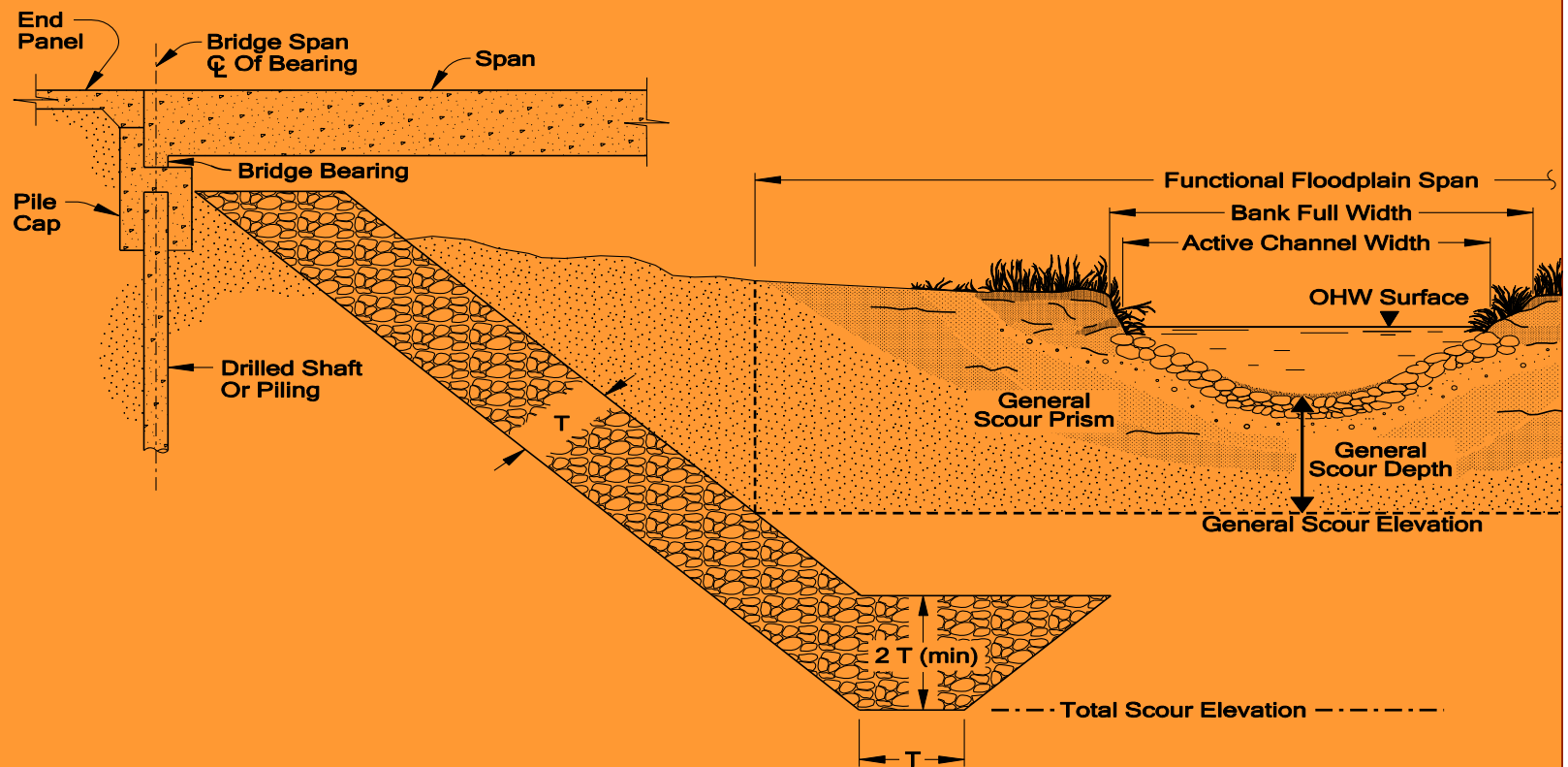
The FPS Evolves: The Size of the Opening

- Incentive for single span bridges:
 - The opening is 1.5 x bankfull width.
- Multiple span bridges:
 - The opening is 2.2 x bankfull width.



The FPS Evolves: Protecting Abutments

- Abutment Protection: Riprap allowed outside the Scour Prism



Note: See Hydraulics Design Manual, Figure 10-17 for more revetment details.

Status

- FPS is part of the Federal Aid Highway Programmatic BO for Oregon
- FPS is the starting point for Individual BO consultations
- The FPS has been pared down to the essentials
- Guidance on the FPS and associated Environmental Performance Standards frequently updated

Lessons

- Include representation from all who will be affected by the permit
- Don't try to cover all situations
- Explicitly connect criteria to the habitat benefit
- Define terms
- Check for practicality
- Educate early and often
- Manage the program



Don't Make the Perfect the Enemy of the Good

Definitely not the Enemy, and due Thanks:

Janine Castro, NMFS/USFWS; Zak Toledo, HDR;
Art Martin, ODFW; Tom Loynes, ODOT;
Paul Wirfs, ODOT; Marc Liverman, NMFS

