CSS NATIONAL DIALOG

Portland, OR Workshop
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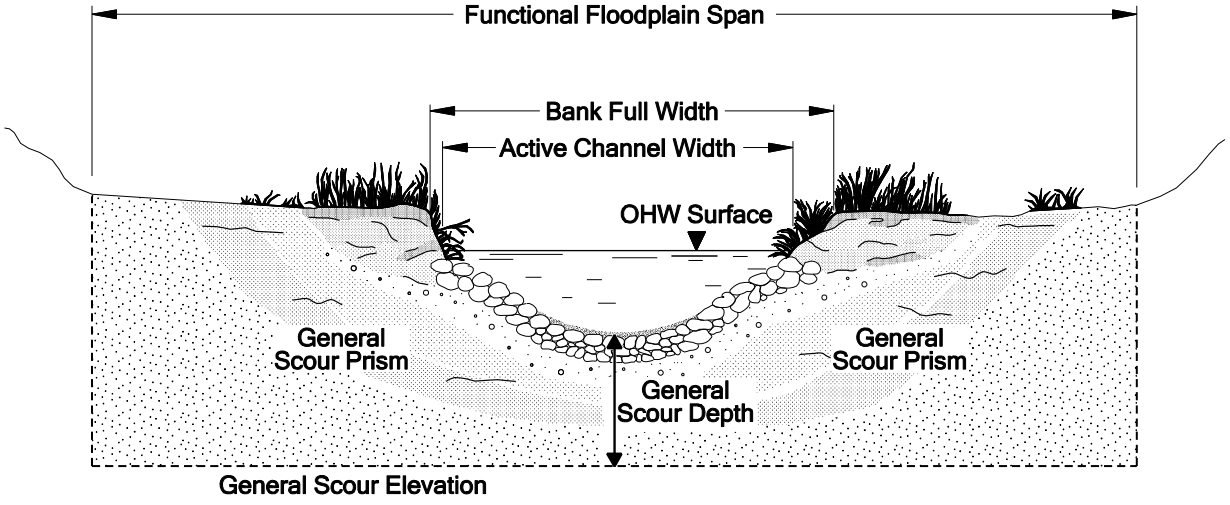
SLOPES IV: Streamlined Permitting



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The nomination for this Context Sensitive Solution is for a program that supports project delivery that provides a programmatic approach for transportation projects ***that promotes natural resource protection, engages stakeholders, and promotes an interdisciplinary approach within the Oregon Department of Transportation.*** ODOT, the National Marine Fisheries Service (NMFS) Portland Office, and the Oregon State Fish and Wildlife (ODFW) partnered on an agency-wide training program to provide guidance on the application of a programmatic approach for compliance with the Endangered Species Act for transportation actions with stream impacts.

The ***Standard Local Operating Procedures for Endangered Species*** (SLOPES IV) contains a programmatic biological opinion (BiOp) and incidental take statement for transportation actions that are permitted through the Army Corps of Engineers 404 Permit. The SLOPES BiOp between the U.S. Army Corps of Engineers (Corps) and NMFS, when used appropriately, allows projects to be permitted without going through individual ESA Section 7 consultation. Although the terms and conditions of the SLOPES IV BiOp provides a focus for permit decisions between NMFS and the Corps, ODOT was invited to provide extensive feedback to NMFS on ways to reduce or remove the adverse effects of regulated actions while facilitating transportation project development, design and construction.

Many bridge and culvert replacements and bank stabilization projects are suited to utilize the SLOPES IV programmatic providing efficiencies to ODOT and other local transportation agencies that require ESA consultation. The ESA Section 7 consultation process can take six months putting it on the critical path for project development timeline as it must be completed in order for federal funding to be released. Cost savings are realized with the SLOPES programmatic as agency costs of producing and processing a Section 7 consultation ranges from $10,000 to $50,000 per project. In addition, when culverts and bridges are designed to maintain the functional floodplain and avoid interference with channel-forming fluvial processes, the agency can realize improved life cycle costs of the structure from reduced maintenance.

In order for ODOT to fully utilize the benefits afforded by the SLOPES IV programmatic, a handbook that translated the terms and conditions of the programmatic into language that could be used to scope, design and permit projects was created for ODOT environmental and engineering staff. The ODOT SLOPES IV Handbook was developed by Paul Wirfs, the ODOT Geo-Hydro Manager who oversees the Hydraulic Program and the Geology and Geo-Tech program for ODOT. A cross-discipline, cross-agency team provided input that helped to craft the Handbook and provided the training. The ODOT SLOPES IV Handbook provides guidance to engineers about how to maintain or restore the floodplain function when designing stream crossings. The Handbook does not replace or supersede any engineering requirements of the ODOT Hydraulic Design Manual.

SLOPES IV – Actual Language (Sample)

Information is presented in a format that is very difficult for Engineers to digest and creates many areas where “interpretation” of the language can lead to inconsistent implementation.

46. Permanent stream crossing replacement. (A) Demonstrate that a permanent stream crossing replacement that passes over a floodplain will not impair the physical and biological processes associated with a fully functional floodplain, and will restore any physical or biological process that was degraded by the previous crossing; **(B)** a crossing will be presumed to maintain or restore floodplain function if it: **(i)** Maintains the general scour prism, as a clear, unobstructed opening (i.e., free of any fill, embankment, scour countermeasure, or structural material); **(ii)** is a single span structure that maintains a clear, unobstructed opening above the general scour elevation that is at least as wide as 1.5 times the active channel width, and otherwise meet NMFS' fish passage criteria (NMFS 2008, or latest version); or **(iii)** is a multiple span structure that maintains a clear, unobstructed opening above the general scour elevation, except for piers or interior bents, that is at least as wide as 2.2 times the active channel width.11 This presumption will not apply to a crossing replacement in a tidally-influenced area, large river delta, or other area with a wide, expansive floodplain that is significantly larger than 2.2 times the active channel width – crossing replacements in those areas require individual consultation; **(C)** scour and stream stability countermeasures may be applied below the general scour elevation, however, except as described above in (B)(ii) and (iii), no scour countermeasure may be applied above the general scour elevation, including but not limited to bendways, channelization, grout, grout bags, rip rap, sheet piling, and sills – maintain clear, unobstructed openings in all stream crossings by using longer spans, altered pier shape and orientation, placing foundations at bents and piers into erosion resistant materials below the general scour elevation, or other integral design features to reduce or avoid problems due to contraction scour or stream instability; **(D)** ensure that all stream crossings are designed and placed to: **(i)** Avoid causing local scour of streambanks and reasonably likely spawning areas; **(ii)** allow the fluvial transport of large wood, up to a site potential tree height in size, through the project area without becoming stranded on the bridge structure; **(iii)** allow for likely channel migration patterns within the functional floodplain for the design life of the bridge; and **(iv)** otherwise align with well-defined, stable channels; **(E)** remove all other artificial constrictions within the functional floodplain of the project area as follows: **(i)** Remove existing roadway fill, embankment fill, approach fill, or other fills; **(ii)** install relief conduits through existing fill; **(iii)** remove vacant bridge supports below total scour depth, unless the vacant support is part of the rehabilitated or replacement stream crossing; and **(iv)** reshape exposed floodplains and streambanks to match upstream and downstream conditions; and **(F)** the electronic notification for each permanent stream crossing replacement must explain how the Corps or applicant will ensure that the new span will maintain or restore the physical and biological processes within the functional floodplain including: **(i)** Site sketches, drawings, aerial photographs, or other supporting specifications, calculations, or information that is commensurate with the scope of the action, that show the active channel, the 100-year floodplain, the functional floodplain, any artificial fill within the project area, the existing crossing to be replaced, and the proposed crossing; **(ii)** a completed scour and stream stability analysis for any crossing that includes scour or stream stability countermeasures within the crossing opening that shows the general scour elevation and the local scour elevation for any pier or interior bent; and **(iii)** the name, address, and telephone number of a person responsible for designing this part of the action that NMFS may contact if additional information is necessary to complete the effects analysis.

Problem

A large chasm exists between the environmental and engineering professional communities including:

- Learning Styles
- Needs and Expectations
- Terminology

Solution

1. Work with NMFS and ACOE to provide comments on permit language that, if incorporated, will improve clarity and consistency with existing engineering protocols.
2. Prepare Handbook using a collaborative multi-discipline approach that explains in more detail the intent and how to implement the requirements in the permit.
3. Prepare and deliver training on contents of handbook. Use a collaborative multi-discipline team to deliver training. Train all affected disciplines together.

Outline of Handbook (155 pages) & Training (8-hrs)

- Overview / Background
- Common Terms (Glossary)
- Common Topics (scoping, drilling, various construction-related topics)
- Major Hazard Response
- Streambank & Channel Stabilization
- Maintenance
- Rehabilitation and Replacement – Roadway (including stormwater)
- **Rehabilitation and Replacement – Culverts and Bridges**
- Utility Line Stream Crossings
- Administration and Reporting

Common Terminology – Glossary

Examples of important basic terminology discussions and how SLOPES IV was modified.

- Bridge

  Final: Bridge means a structure of any span, as distinguished from culverts, that includes superstructure and substructure components including abutments or arches and supports a deck erected over a depression or an obstruction, such as water, and having a track or passageway for carrying traffic or other moving loads. Single span rigid frame structures with a span 20 feet or greater, measured perpendicular to the centerline of the hydraulic opening, are considered bridges.

  Original: Bridge means a structure, including supports, built over a stream, with a roadway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20-feet between undercopings of abutments, spring lines of arches, or the extreme ends of the openings for multiple boxes.

- Culvert

  Final: Culvert means a structure of any span, as distinguished from bridges, that is usually covered with embankment and is composed of structural material around the entire perimeter including pipes, arches, and box culverts. Some culverts are supported on spread footings with the streambed serving as the bottom of the culvert, such as arches and rigid frames. Single span rigid frame structures with a span less than 20 feet, measured perpendicular to the centerline of the hydraulic opening, are considered culverts.

  Original: Culvert means any structure under the roadway with a clear opening of 20-feet or less measured along the center of the roadway

- Bankfull Width

  Final: Bankfull width means the stream width measured perpendicular to stream flow between the bankfull elevations. Compare active channel width – because bankfull width is measured between bankfull elevations, it is typically wider than active channel width, which is measured between ordinary high water marks.

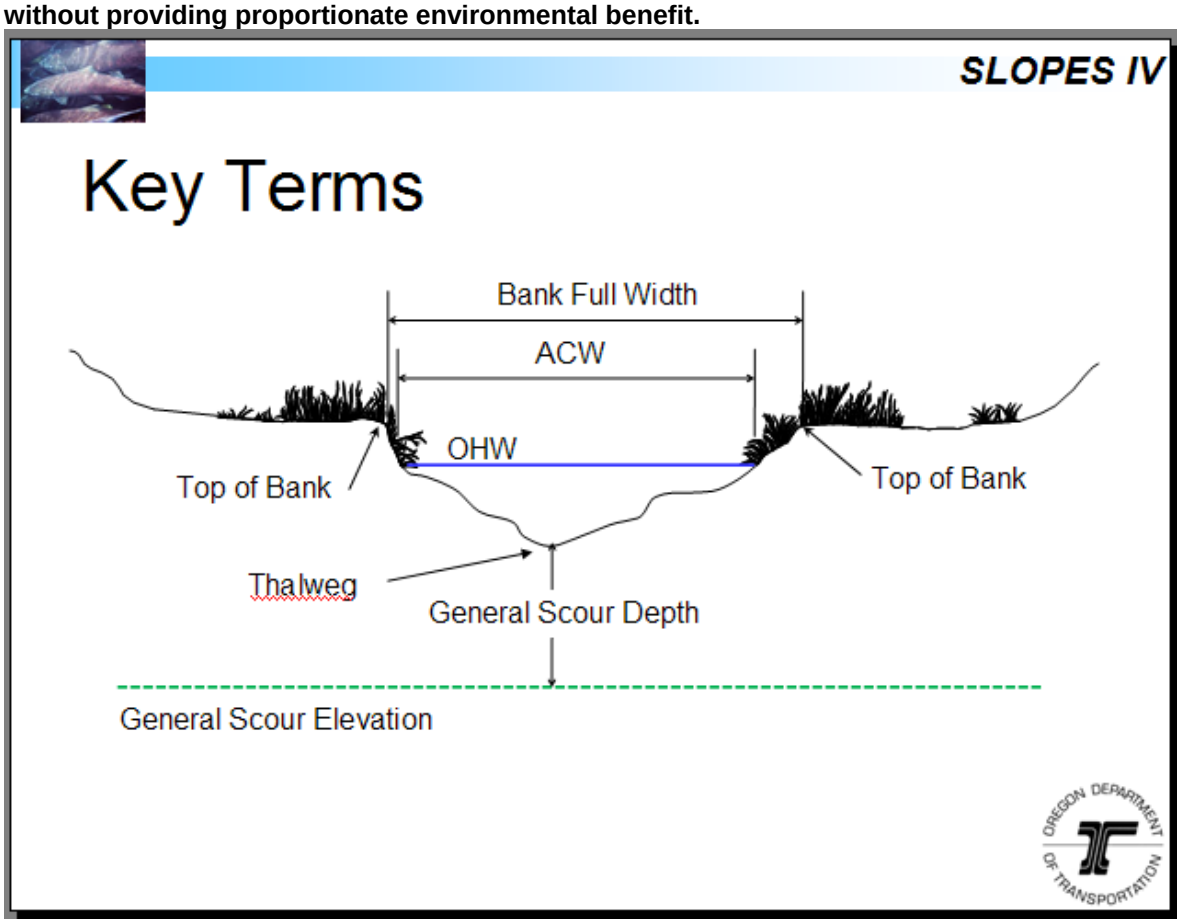
  Original: Bankfull width – see active channel width.

o Active Channel Width

Final: Active channel width means the stream width measured perpendicular to stream flow between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate. This width includes the cumulative active channel width of all individual side- and off-channel components of channels with braided and meandering forms, and measure outside the area influence of any existing stream crossing, e.g., five to seven channel widths upstream and downstream.

Original: Active channel width, or bankfull width, means the horizontal distance along a transect measured perpendicular to stream flow, from bankfull elevation on one bank to bankfull elevation on the opposite bank. Include the cumulative active channel width of all individual side- and off-channel components of channels with braided and meandering forms, and measure outside the area influence of any existing stream crossing, e.g., five to seven channel widths upstream and downstream.

Key Concept – Bankfull width does not always equal the active channel width. If bankfull width is used incorrectly it could require structures to be significantly increased in size without providing proportionate environmental benefit.



- General scour

  Final: General scour means a lowering of the streambed across the stream or waterway at the bridge. This lowering may be uniform across the bed or non-uniform. That is, the depth of scour may be deeper in some parts of the cross section. General scour may result from contraction scour which involves removal of material from the bed across all or most of the channel width (see above), or other general scour that may cause a non-uniform lowering of the bed due to conditions such as changes in flow around a bend, at the confluence of two tributaries, downstream of a bar or island, or short-term (daily, weekly, yearly, or seasonal) changes in the downstream water surface elevation that control backwater.

  Final: General scour depth, or general scour elevation, means a cross section reference line showing the probable vertical distance that a streambed will be lowered by general scour below a reference elevation during the scour design discharge or scour check discharge, whichever is more severe, including commonly accepted minimum safety factors.

  Final: General scour prism means all floodplain, bank, and streambed material above the general scour depth or general scour elevation.

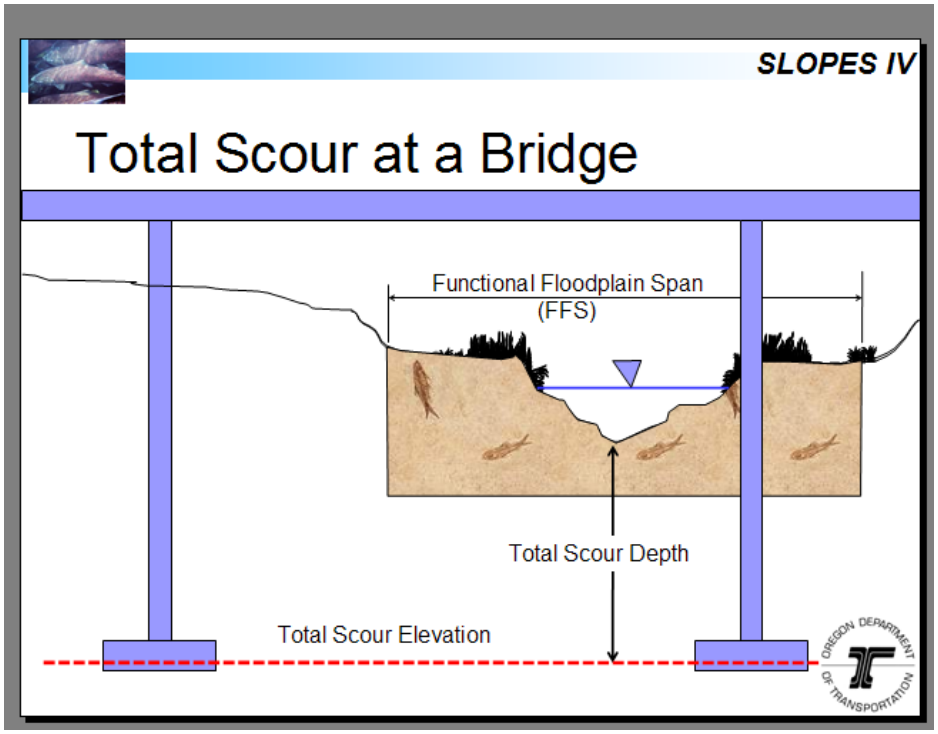
  Original: No definitions were provided for General Scour, General Scour Depth, or General Scour prism.

- Local Scour

  Final: Local scour means removal of material from the channel bed or banks which is restricted to a relatively minor part of the width of a channel, such as scour in a channel or on a floodplain that is localized at a pier, abutment, or other obstruction to flow. Local scour is caused by the acceleration of the flow and the development of a vortex system induced by the obstruction to the flow and does not include the additional scour caused by any contraction, natural channel degradation, or bendway.

  Original: Local scour means erosion of material from around piers, abutments, spurs, and embankments caused by an acceleration of flow and resulting vortices induced by obstructions to the flow.

Key Concept: Definitions of General scour and Total scour must be clearly described to reduce misunderstandings. The definition of General Scour has been modified and is different from FHWA HEC-18 to represent the intent of the environmental regulation. It is important to explain to all audiences the significant different between the magnitudes of scour being discussed – Design scour for the safety of the bridge? Or is it the scour event that is a concern for the species of concern?

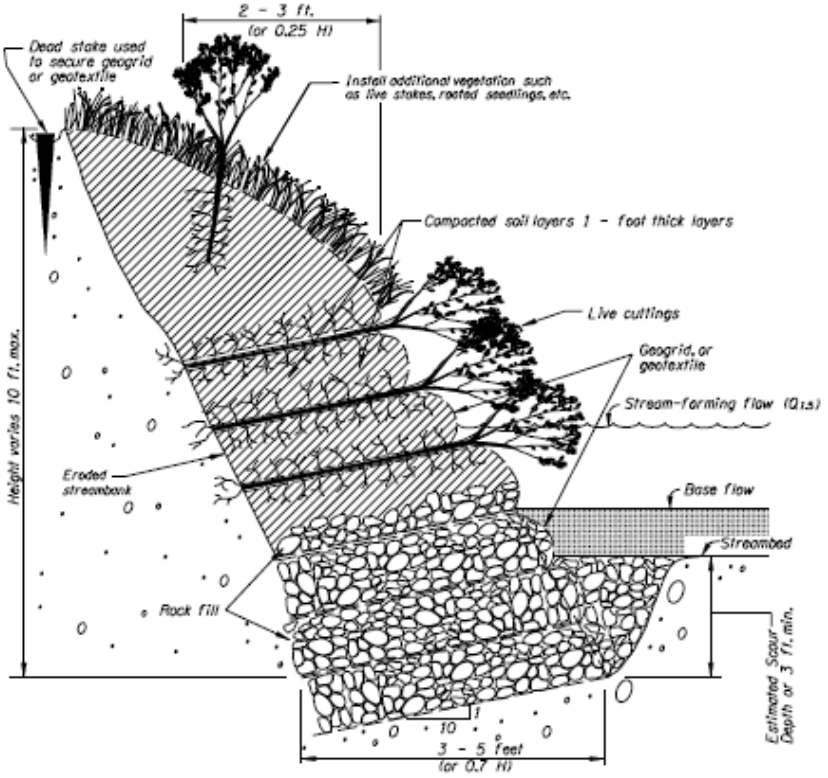


<u>Examples of tools included in ODOT prepared SLOPES IV handbook:</u>
Prepared by a multidiscipline team from multiple state and federal agencies.

- Scoping (common theme – early, collaborative effort)
- Replacement (Presumed Approach / Basic Goals Approach)
- Examples (Acceptable designs)
- Actions NOT covered by SLOPES IV
    - New bridges or culverts
    - Tide Gates
    - Steel Piles larger than 24” diameter
    - etc

- Flowcharts
- Checklists
- Forms
- References

Example (Acceptable Design – Bank Protection)

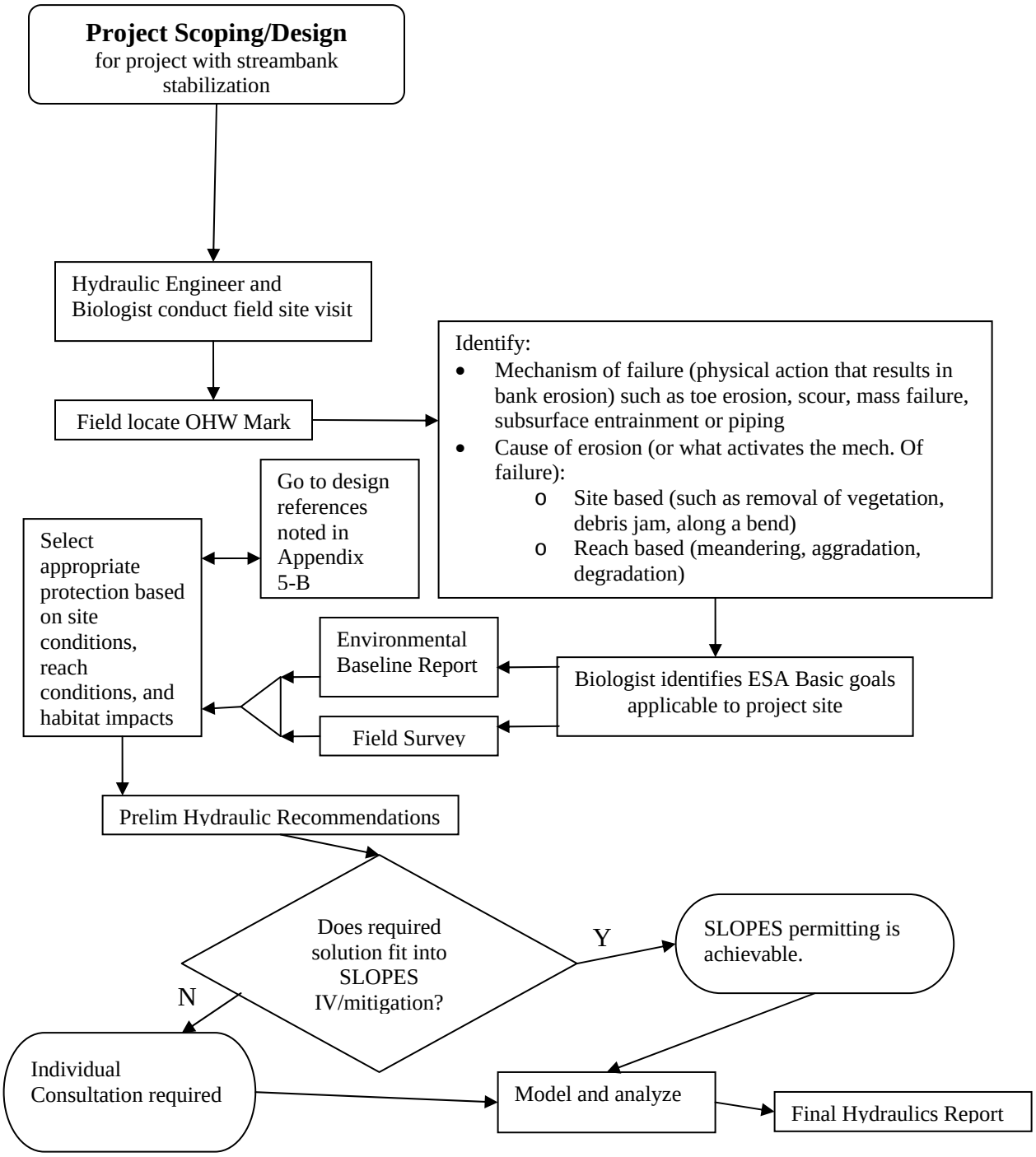


Notes:

1. This detail is for over-steepened, eroded banks 10 feet or less height (H). Vegetated geogrids that are higher than 10 feet will require a stability analysis.
2. Rooted/leafed condition of the living plant material is not representative of the time of installation.
3. Adapted from USDA, NRCS, Engineering Field Handbook, Chapter 16

Figure 15-25 Vegetated Geogrid Details

Flowchart


Project Scoping/Design
for project with streambank stabilization
Hydraulic Engineer and Biologist conduct field site visit
Field locate OHW Mark
Identify:
Mechanism of failure (physical action that results in bank erosion) such as toe erosion, scour, mass failure, subsurface entrainment or piping
Cause of erosion (or what activates the mech. Of failure):
Site based (such as removal of vegetation, debris jam, along a bend)
Reach based (meandering, aggradation, degradation)
Go to design references noted in Appendix 5-B
Select appropriate protection based on site conditions, reach conditions, and habitat impacts
Environmental Baseline Report
Field Survey
Biologist identifies ESA Basic goals applicable to project site
Prelim Hydraulic Recommendations
Does required solution fit into SLOPES IV/mitigation?
Y
N
SLOPES permitting is achievable.
Individual Consultation required
Model and analyze
Final Hydraulics Report

Check List

Type of Action:

Identify the type of action proposed.

Actions Requiring No Approval from NMFS:

- ☐ Major Hazard Response
- ☐ Streambank and Channel Stabilization
- ☐ Maintenance/Rehabilitation/Replacement
- ☐ Utility Line Stream Crossing

Actions Requiring Approval from NMFS:

- ☐ Replacement Culvert or Bridge
- ☐ Vegetated Riprap with Large Wood
- ☐ Stormwater Facility
- ☐ Surface Water Diversion > 3cfs
- ☐ New/Upgraded Stormwater Outfall

NMFS Species/Critical Habitat Present in Action Area:

Identify the species found in the action area:

EFH Species:

- ☐ Lower Columbia River Chinook Salmon, Chinook
- ☐ Upper Willamette River spring-run Chinook Salmon, coho
- ☐ Snake River spring/summer run Chinook Coastal Pelagics
- ☐ Snake River fall-run Chinook Groundfish
- ☐ Upper Columbia spring-run Chinook
- ☐ Columbia River chum
- ☐ Lower Columbia River coho
- ☐ Oregon Coast coho salmon
- ☐ Southern Oregon/Northern California coho
- ☐ Snake River sockeye
- ☐ Lower Columbia River steelhead
- ☐ Upper Willamette River steelhead
- ☐ Middle Columbia River steelhead
- ☐ Snake River Basin steelhead
- ☐ Upper Columbia River steelhead
- ☐ Green sturgeon

Terms and Conditions:

Oregon Department of Transportation Biology Monitoring Report

Annual Report (Year X1) Check if Final Report: □

Project Information							
Project Name					**Project Sponsor**	*ODOT or BDU*	
Site #	*BMxxxxx*	**Key #**	*Kxxxxx or Mxxxxx*	**Fed Aid #**		**OTIA Bundle & Bridge #**	
Project Type					**Year Construction Completed**		
Investigator	*Name & Phone Number*						
Mitigated Biology Impact(s)[2]							

Location Information							
Region		**County**		**Route No.**			
MP		**Area Mitig. (Acres)**			**Linear Mitig. (Feet)**		
T/R/S*				**HUC (6th Field)**			
Latitude*				**Longitude***			

* Site Center Only

Permit Information			
Item #	**Permit Type[3]**	**Permit Agency**	**Permit Number**
1			
2			
3			
4			
Species (Common Name)			

Summary Current Year Monitoring Results[4]					
Report Submittal Date		**Permit Compliance**			
Mitigation Category[5]	**Summary of Action**		**Permit Item # (s)**	**Permit Condition s[6]**	**Status [7]**

[1] Post-Construction Year Number (1, 2, 3, etc.).

[2] Impact Categories: Fish Access; Aquatic Habitat; Riparian Habitat; Drainage Modification; New Impervious Surface; Wildlife Habitat; Wildlife Access; Rare Plants.

[3] Permit Type: Individual or Programmatic BO, Corps Sec. 404 Permit, DSL Fill/Removal Permit, etc.

[4] See Attachment 1 for detailed results for more specific mitigation items, as well as monitoring results maps and/or photos.

[5] Mitigation Categories: Fish Passage; Fish Habitat; Wildlife Passage; Wildlife Habitat; Rare Plant Habitat, Water Quality.

[6] Permit condition or chapter number (e.g., 2.a.iii); See Attachment 2 for copy of Permit Conditions.

[7] Status Categories: NA = Not applicable this monitoring year, G (Green) = On track for success; Y (Yellow) = At Risk and needs maintenance, or R (Red) = failing and needs corrective work; B (Black) = Complete and meets final permit success requirements.

Training Sessions

Prepared and delivered by a multidiscipline team from multiple state and federal agencies.

- ODOT Engineers
- ODOT Environmental Specialists
- National Marine Fisheries Service
- Oregon Department of Fish and Wildlife
- Army Corps of Engineers