Presented at Puget Sound Shorelines and the Impacts of Armoring Workshop,
May 12-14 2009.
This presentation not peer reviewed.

Puget Sound Marine Shoreline Modifications Guidelines

WASHINGTON'S AQUATIC HABITAT GUIDELINES (AHG) PROGRAM

Washington Department of FISH and WILDLIFE

WASHINGTON STATE Recreation and Conservation Office

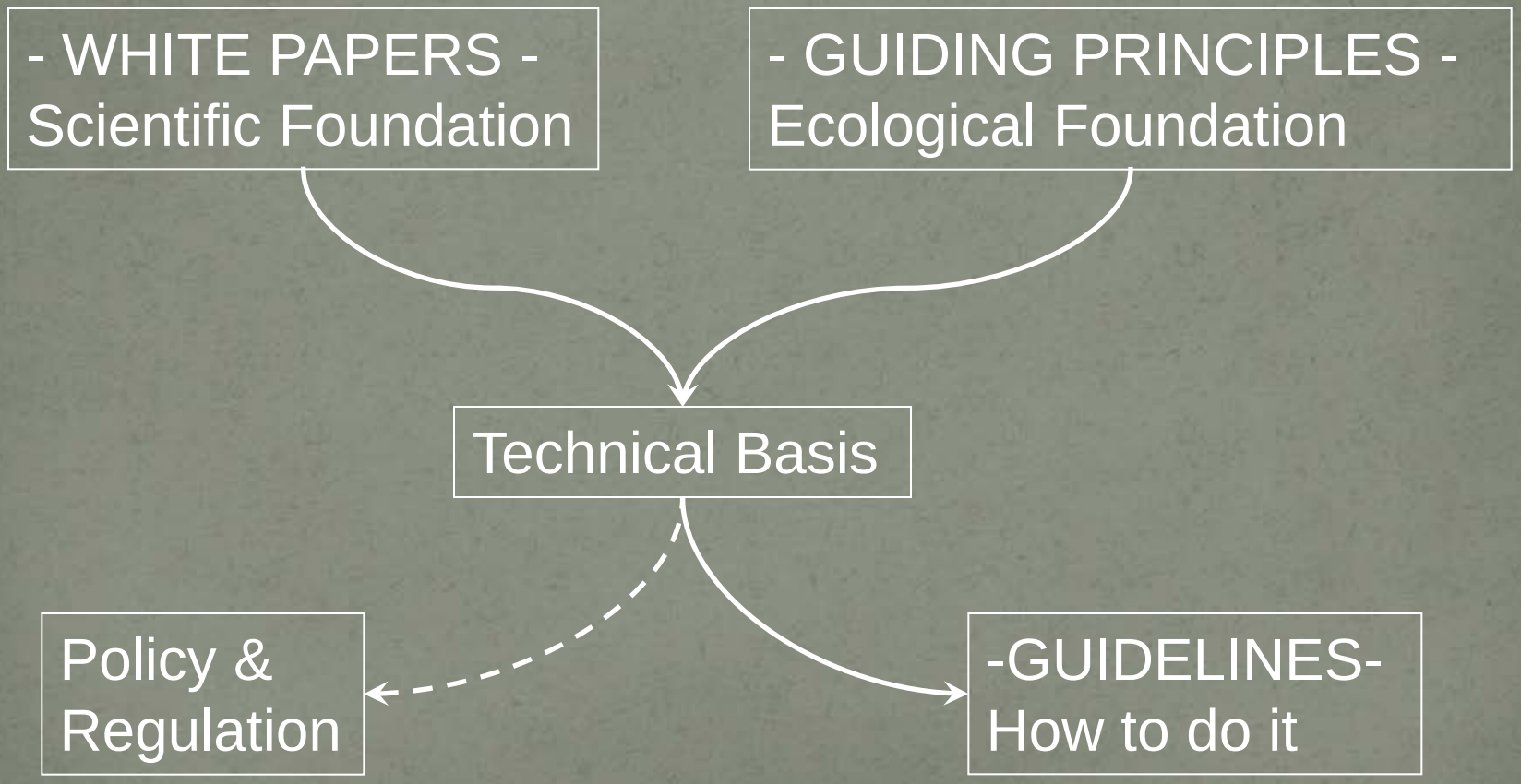
Washington State Department of Transportation

U.S. FISH & WILDLIFE SERVICE

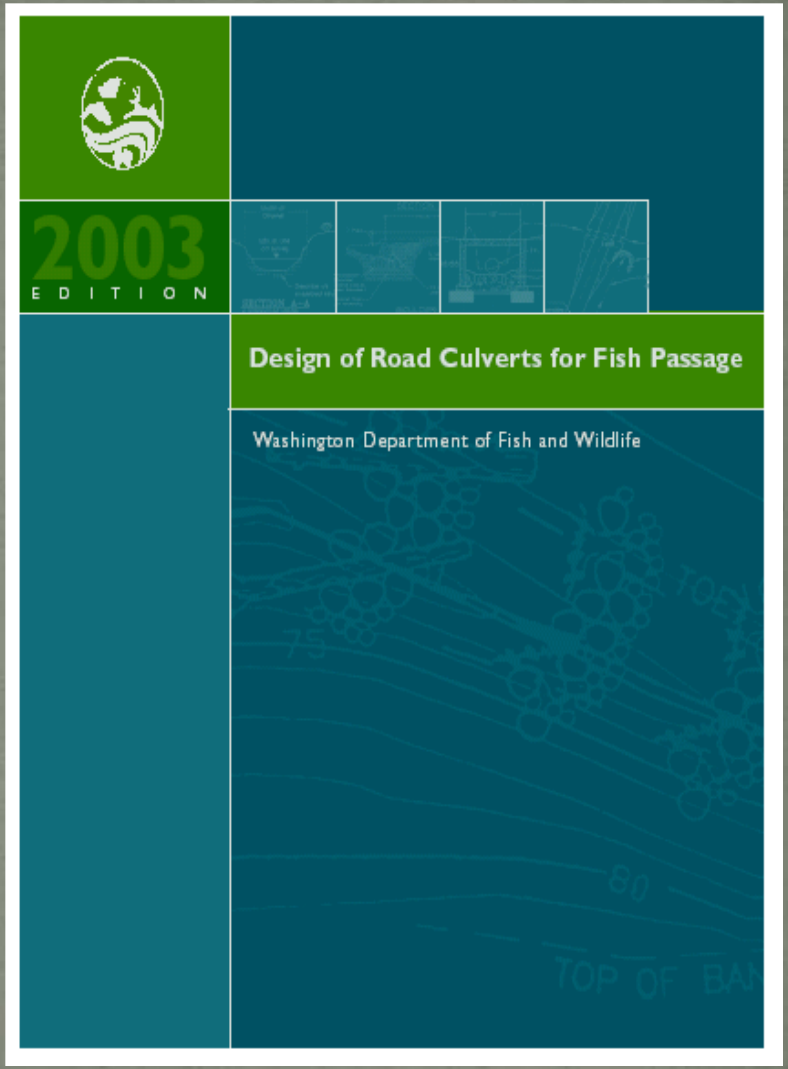
WASHINGTON STATE DEPARTMENT OF ECOLOGY

WASHINGTON STATE DEPARTMENT OF Natural Resources

Aquatic Habitat Guidelines Development



“Natural processes that are protected and restored will minimize risk and provide sustainability to ecosystem functions.”



Stream simulation culvert design method

– simulation of natural channel processes inside the culvert.

ISPG

"Compensatory mitigation for adverse impacts has risk and uncertainty of success, and should continue over time and area of impact."

Integration of

- Project goals
- Assessment results
- Design factors
- Mitigation for impacts

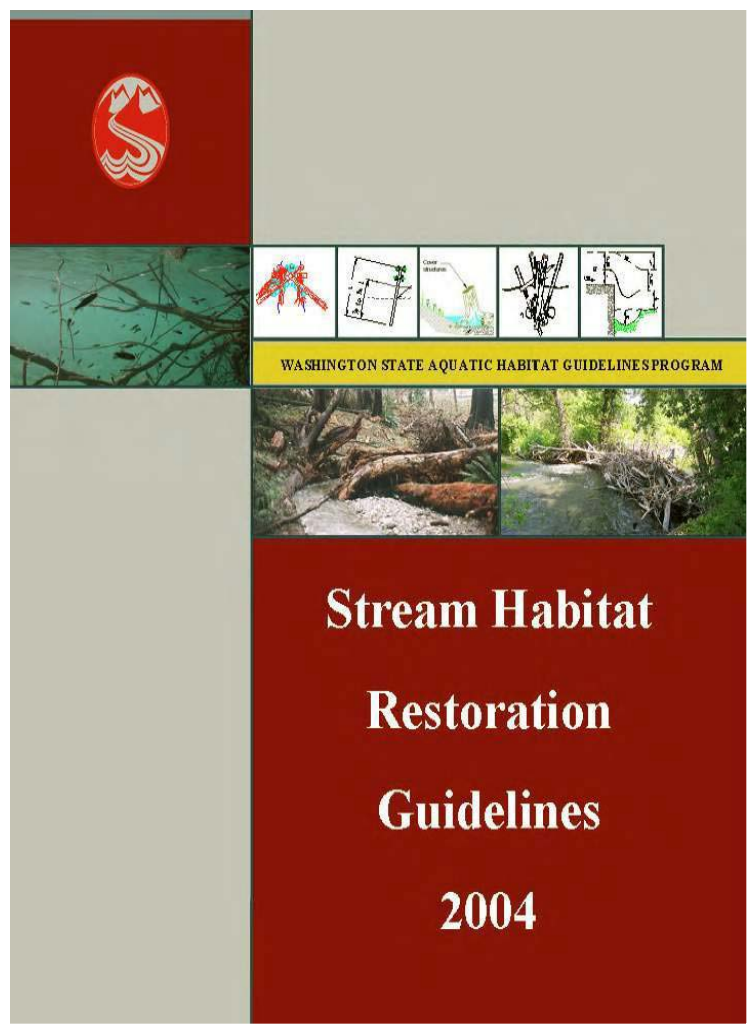
ISPG

Assessment:

- Site analysis
- Reach analysis
- Risk (civil and ecological)
- Habitat impacts and enhancements

SHRG

"Our limited understanding of ecological processes and engineered solutions is addressed by using the best available science and erring on the side of caution in project management, design, timing, and construction."



Interim guide provides a synthesis of current science on several important nearshore habitats and processes, and directions for where to find data and

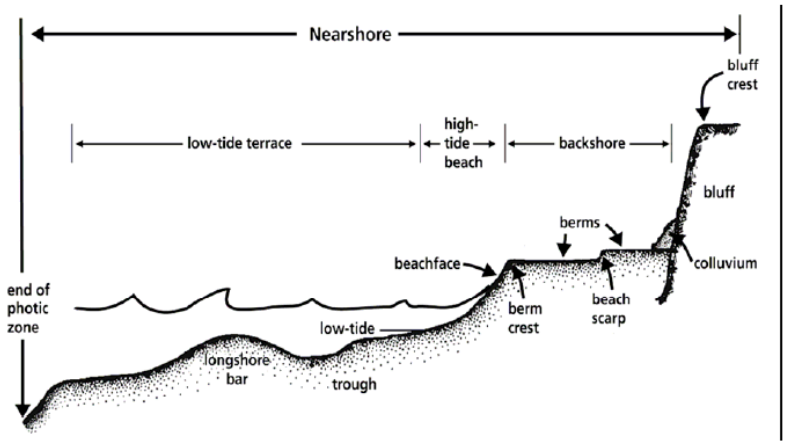


Figure II.1. Diagram of Puget Sound nearshore terminology (Johannessen and MacLennan 2007).

Protecting Nearshore Habitat and Functions in Puget Sound

An Interim Guide

October 2007

EnviroVision,
Herrera Environmental, and
Aquatic Habitat Guidelines Working Group[1]

specific recommendations for moving through the mitigation sequence; from avoidance of new activities and reducing impacts from approved activities, to mitigating for cumulative impacts.

Figure II.16. Unaltered riparian vegetation (left photo by R. Carman), and an example of bluff erosion following riparian vegetation removal (right photo, Brennan 2007).

“Where shoreline armoring is necessary for erosion control, planners should enforce or encourage the use of alternative design methods that avoid and minimize environmental impacts to the greatest extent possible, and require that unavoidable impacts be fully mitigated.”

Marine Shoreline Modification Guidelines

Draft outline

1. Background science & literature
1. Policy issues
2. Site & reach assessment
3. Project design
    - Integration of assessment, risk, mitigation and site requirements
    - Techniques
    - Standards and details
    - Monitoring and contingency
4. Case studies

Alternatives to “hard armor”

1. Restoration of original shore geometry (bulkhead removal or setback)
2. Beach nourishment (gravel beach design)
3. Grade control/slope support with large wood and/or rock
4. Wood revetment or wood/rock revetment
5. Biotechnical slope support (vegetated geogrids, soil pillows, etc)

Turnbull large wood revetment

Fox Is. (SW facing)

8/8/2006 2:13 PM
Turnbull large wood revetment

Turnbull - pre-project

8/11/2006 1:30 PM
Mercer large wood revetment
Key Peninsula

11. 10. 2005

11. 10. 2005

Mercer after storm

6 2:59 PM
3. 20. 2002
Hannabutte – Gig Harbor Peninsula

Large wood and short bulkhead

Frye Cove County Park

Large wood and cobble slope stabilization

7/11/2006 2:14 PM
Port Peninsula
Gravel Beach