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Seattle District



Levees and Environmental Sustainability

Balancing Public Safety and the Environment

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The Challenge

Building and maintaining flood levees
in a manner that
sufficiently protects the public
without inflicting harm
to the adjacent ecosystem.

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Natural River Bank



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Levee Maintained to National Standards



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CONSTRAINTS

- Life, health and safety cannot be compromised
 - Vegetation on levees is restricted
- Compliance with Environmental Laws
- PL84-99 Program Limitations
 - Funding
 - Replacement to pre-flood condition
 - Urgency to repair

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What does this mean???

- Public Safety is paramount.
- Urgency of PL84-99 Levee Rehabilitation limits flexibility and creativity.
- Mitigation is often requested to comply with ESA.
- Voluntary Levee maintenance to Corps standards
- Not appropriate program for long term resolution of environmental issues.

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Toolbox for Environmental Sustainability

- Program Eligibility
 - Vegetation Variance
- Levee Rehabilitation
 - Build within established work windows for fisheries
 - Willow Plantings
 - Changing levee slopes (laybacks)
 - Large Woody Debris placement
 - Planting Benches
 - Setbacks
- Long term Planning
 - Use other existing, or new, Corps Authorities to develop novel programmatic approaches to generate any compensatory mitigation that is required by Corps rehabilitation efforts

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Levee Maintained to Seattle District Variance



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Willow Plantings



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LWD Placement, Willow Plantings and Layback





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Juvenile Salmonid Use of Natural and Hydromodified Stream Bank Habitat in the Mainstem Skagit River, Northwest Washington; Beamer and Henderson, SSC, September 1998



Table 4. Expected change in fish abundance by cover type normalized to fish abundance in riprap. Results are average values for all reaches sampled. Values where the expected change is greater than threefold are shown in bold print.

Cover Type	Sub-yearling Chinook	Sub-yearling Chum	Summer Rainbow Age 0+	Summer Older Rainbow	Summer Coho Parr	Winter Rainbow Age 0+	Winter Older Rainbow	Winter Coho Presmolt
No Cover	0.9	0.3	0.9	0.0	0.0	0.0	0.0	0.0
Boulder	1.3	0.3	1.2	0.3	0.5	0.0	0.0	0.0
Cobble	3.3	1.3	6.9	0.3	1.5	0.4	0.1	0.0
Plants	2.1	16.4	NA	NA	NA	0.0	0.0	0.0
Riprap	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Rubble	0.4	0.4	1.8	0.4	0.2	0.3	0.0	0.1
Wood	5.4	0.8	2.1	0.7	3.7	0.8	0.4	1.6
bankroots	4.5	0.2	1.2	3.1	1.9	0.3	0.0	0.0
debris piles	6.4	1.2	2.6	0.4	1.9	1.8	0.9	2.2
single logs	1.2	0.5	0.8	0.4	0.5	0.2	0.1	0.2
rootwads	8.7	0.6	3.9	1.3	17.9	1.7	2.0	4.2

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