

Using Habitat Models to Support Conservation Decisions in the Cedar-Sammamish Watershed

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"My question is: Are we making an impact?"

Brian Murray
King County
Science Seminar
May 16, 2006

Presentation Overview

- What is EDT, anyway?
- How has it been applied in WRIA 8?
- Cedar Restoration Actions
- Cedar River Results
- Cedar Preliminary Conclusions
- Bear Creek and Sammamish River Restoration Actions
- Bear / Sammamish Results
- Bear Preliminary Conclusions
- Next Steps

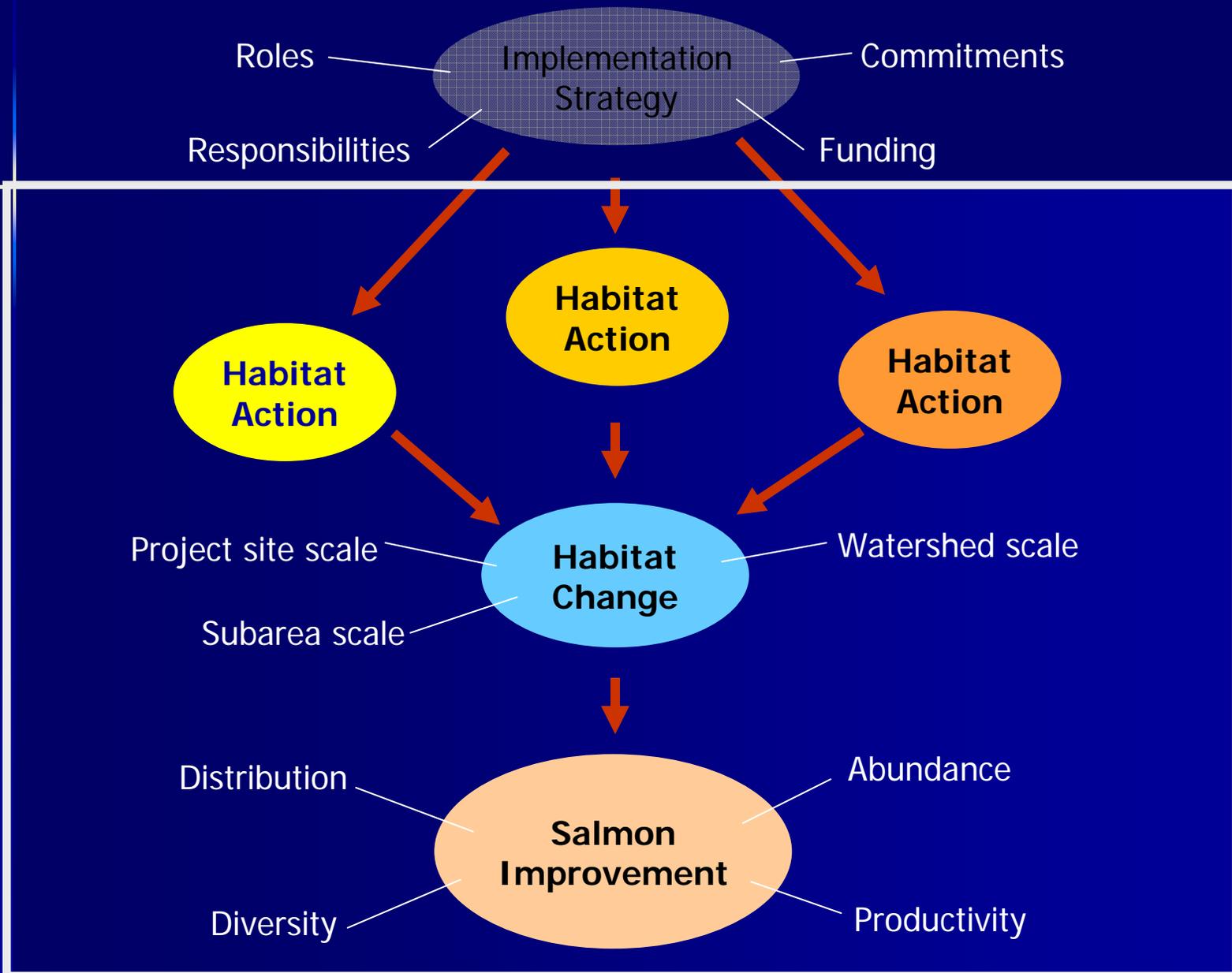
EDT Overview

- EDT = 'Ecosystem Diagnosis and Treatment'
- Habitat 'Diagnosis' by Comparing *Patient* (Current Condition) with *Template* (Historic Condition)
- Diagnosis identifies what works, what doesn't work, and where
- Treatments – how well do actions address the diagnosis and improve salmon performance?

How Have We Used EDT So Far?

- Nested within other analytical tools (VSP and Watershed Evaluation)
- Diagnose habitat conditions to be protected or restored – hypotheses at reach and landscape scales
- Geographic priorities at the reach and sub-basin scale
- Relative comparisons of fish response to habitat conditions – NOT a population model

Using Scientific Analyses to Build Hypotheses



How does the Treatment support decision-making?

- Relative comparison of action effectiveness over a given time period for Chinook or coho
- Geographic comparisons – e.g. Cedar River vs Bear Creek vs Samm River
- How far will a proposed set of actions get us toward our objectives?
- Monitoring and evaluation – test hypotheses about actions over time

Uncertainty Alert!!! Model Results Ahead!



All Models Are WRONG...

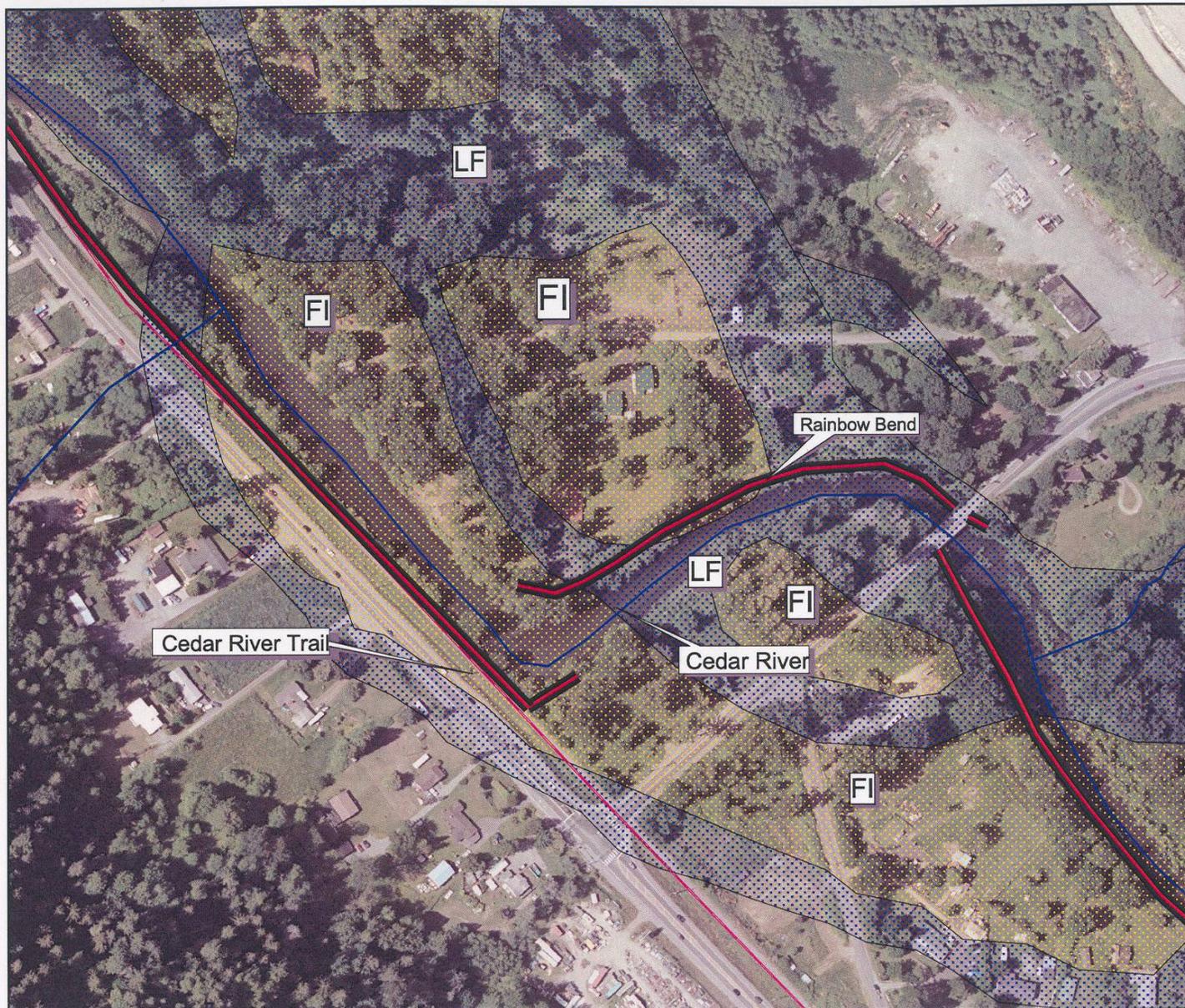
But Some Models
are USEFUL

'Treatment' Work to Date

- Build 'Action Library'
 - W8TC developed assumptions for action categories
 - Workshops (Cedar, NLW, Sammamish, Issaquah) with regional experts to apply assumptions to each start-list action
- Scenarios combining actions from the library
 - Relative impacts of individual actions
 - 10 and 25 yr predicted impacts on Chinook and coho abundance, productivity, and life history diversity
 - Establish habitat objectives to support biological objectives

C235: Rainbow Bend



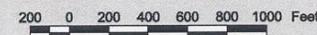


Legend

-  Wtrcrs
-  Riverfac.shp
-  Trail
- Cedar_glo**
-  FFHF
-  FI
-  LF
-  TRIB



August 25, 2005



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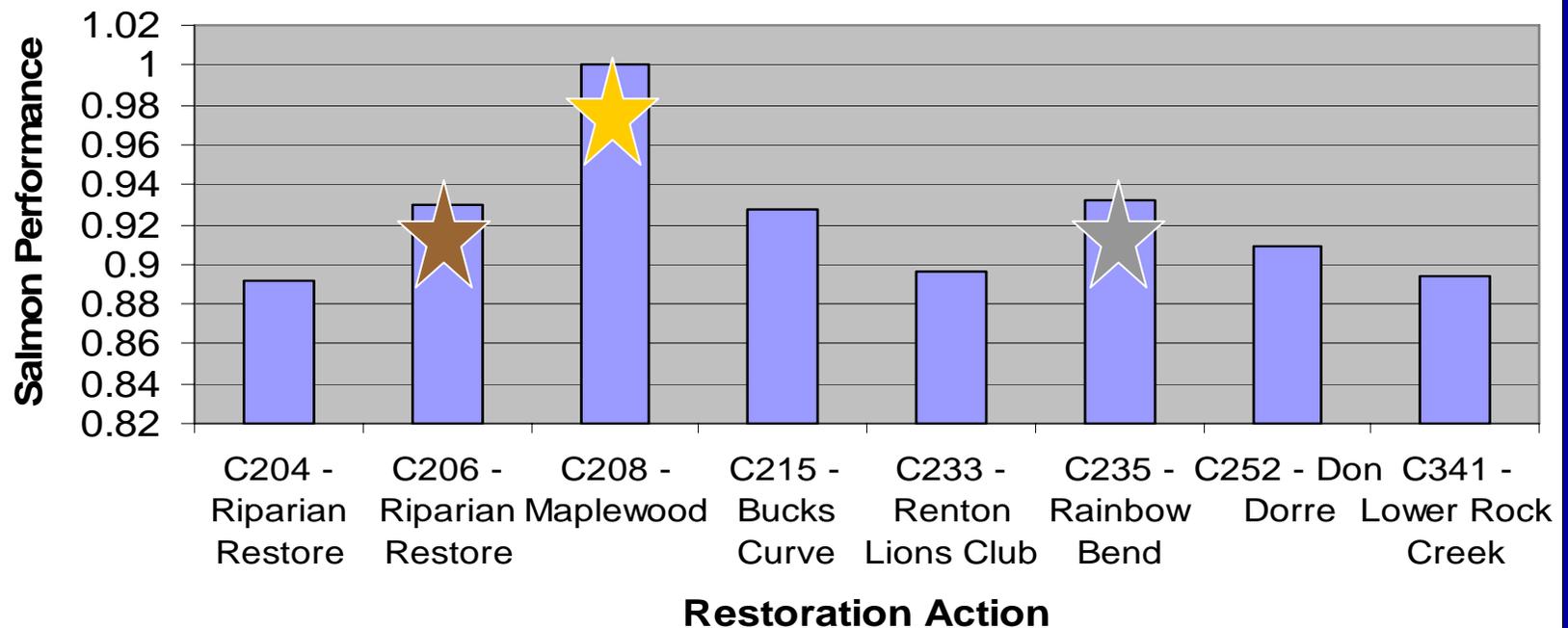
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C232 Belmondo Cedar Grove Rd

1865 General Land Office Survey Cedar Channel Map

Cedar Results – Action Prioritization

Relative Impact of Start List Restoration Actions on Chinook Salmon Performance (Combining Abundance, Productivity, and Life History Diversity)



Cedar Results – Chinook Response

Scenario Results:

- 45% Increase in Abundance
- 20% Increase in Juvenile Production
- Improved life history diversity

Compared to Plan Objectives:

- 70% of Abundance Objective
- 20% of Juvenile Production Objective
- Improves ability to support in-stream rearing life history

Cedar River Preliminary Conclusions

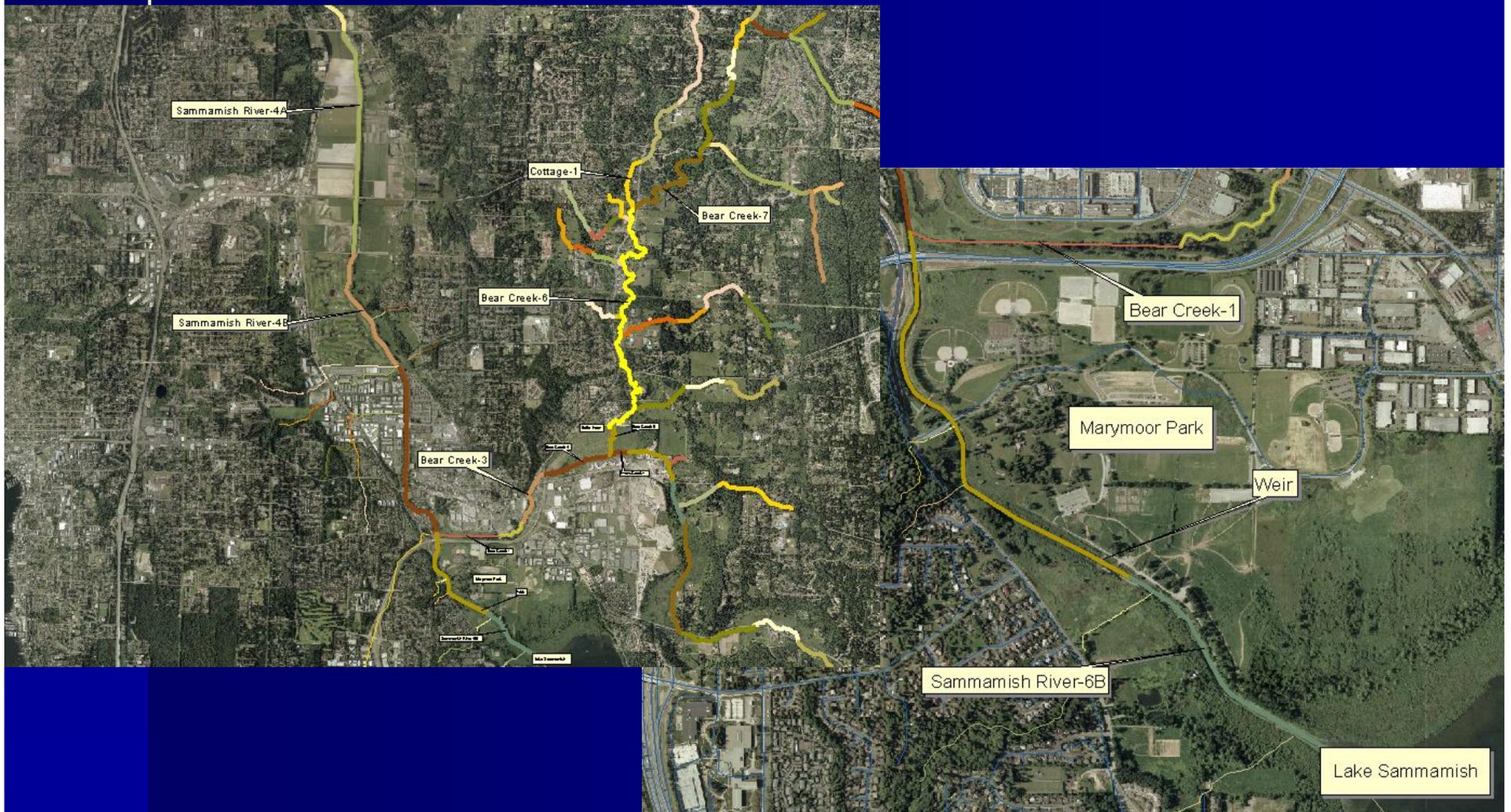
- Actions are on the right track
 - effectively target habitat diversity
 - effectively target juvenile rearing life stage
- Significant restoration potential remains in Reach 3
- More floodplain actions needed to achieve 10-yr plan objectives
- Modeling needs to include land use and protection assumptions (in progress)

Bear Creek Example: N208 Keller Farm



- Channel Restoration at confluence of Bear and Evans
- LWD and off-channel habitats
- Riparian revegetation

Sammamish River Example: N343/N356 Flood 'Benches' and N358 Transition Zone



Bear Creek Results: Action Prioritization

	Bear Creek Action	Diversity Rank	Prod Rank	Abund Rank	Overall Rank
★	N201 Lower Bear Reach 1	3	7	3	3
★	N206 Rip Reach 3	2	6	2	2
★	N208 Keller	1	1	1	1
	N220 Rip Reach 7	6	4	4	6
★	N228 Rip Reach 8	4	2	7	3
★	N236 Nickels	5	3	5	3
	N282 Lower Cottage Reach 1	6	5	6	7
	N298 Cottage Rip Reach 2	6	6	8	8

Sammamish River Results: Action Prioritization

Sammamish River Action	Diversity Rank	Prod Rank	Abund Rank	Overall Rank
N358 Marymoor Transition	7	8	8	8
★ N343/356 Regrade and Reveg	1	1	1	1
★ N339 et al – Trib Mouths	2	2	2	2
★ N201 Bear Creek mouth	3	3	3	3
N337 Bothell RB Side-Channel	7	7	7	7
N338 Bothell LB Side-Channel	4	4	4	4
N334 Wildcliff Shores	4	5	5	5
N335 Swamp Creek Mouth	6	6	6	6
N362 Upper Samm R Rip	7	8	8	8

Bear and Sammamish Chinook Response

Scenario Results:

- 49% Increase in Abundance
- 30% Increase in Juvenile Production
- Improved life history diversity

Compared to Plan Objectives:

- 80% of Abundance Objective
- 30% of Juvenile Production Objective
- In progress

Bear / Sammamish Preliminary Conclusions

- Actions are on the right track
 - effectively target habitat diversity
 - effectively target juvenile rearing life stage
- Target actions in Reach 6 (between Evans and Cottage confluences)
- Additional riparian restoration and LWD throughout Bear
- In Sammamish, additional channel restoration downstream of Bear Creek

Next Steps:

- Additional Restoration Actions beyond 'Start-List'
- Future Land Use Scenarios: PSRC
- Data Quality – establish baseline range for habitat characterization
- Monitoring Program: Observed data needed on actions and fish response to improve modeling over time

Acknowledgments

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