

Dry Creek

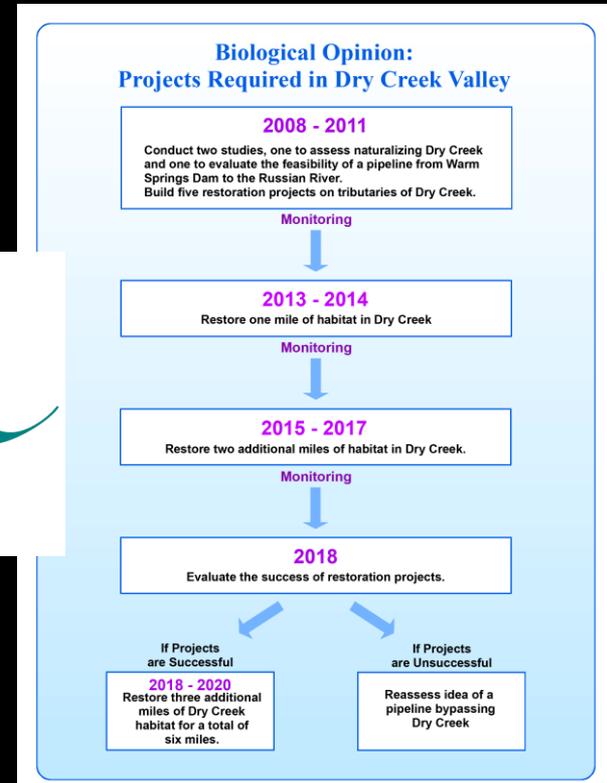
Fish Habitat Enhancement Feasibility Study
Current Conditions Summary





RRIFR

**Russian River Instream
Flow and Restoration**



Dry Creek Fish Habitat Enhancement

- Component of Russian River Instream Flow and Restoration (Biological Opinion)
- Habitat enhancement for coho salmon and steelhead trout
- Opportunity: abundant cool water in late summer





Habitat Enhancement Feasibility Study

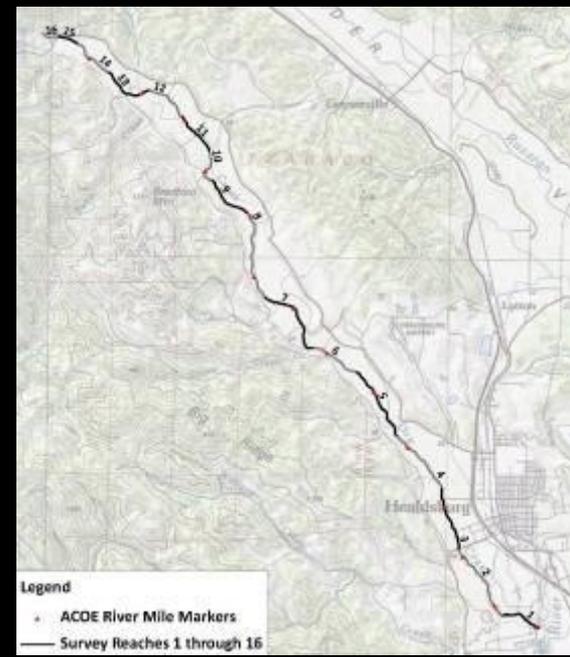
- Two Study Phases

1) Inventory of Current Conditions

- **Watershed Characteristics/History**
- **Stream Geomorphology Today**
- **Fish Habitat**

2) Feasibility Analysis and Conceptual Design





Watershed Characteristics

- 217 sq. mi. (130 sq. mi. upstream of Warm Springs Dam)
- Largest tributary to Russian River based on annual runoff
- Creek flow pattern pre-Warm Springs Dam
 - Typical of Mediterranean Climate
 - High floods resulting from winter rainstorms
 - Very low flow (dry in many years) in summer



Watershed History

1850s: Valley settled

- 40% of forested acres cleared 1850-1870
- Increased runoff and sediment to lower valley
- These actions initially raised creek bed (3')
- Vegetation recovery resulted in creek bed lowering by turn of century (4')

1900 – 1970s: Gravel mining in Russian River

1950s -1970s: Gravel mining in Dry Creek near Westside Br.

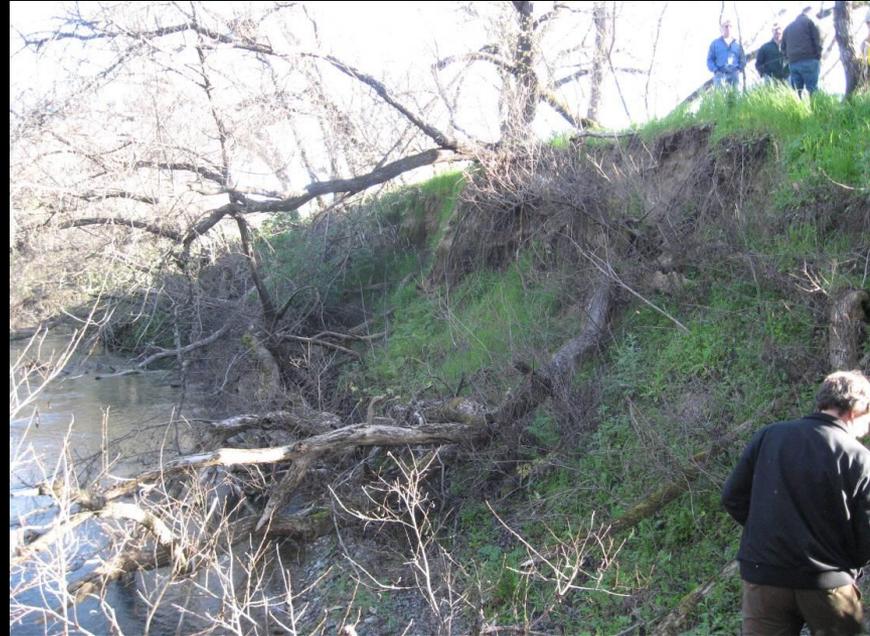
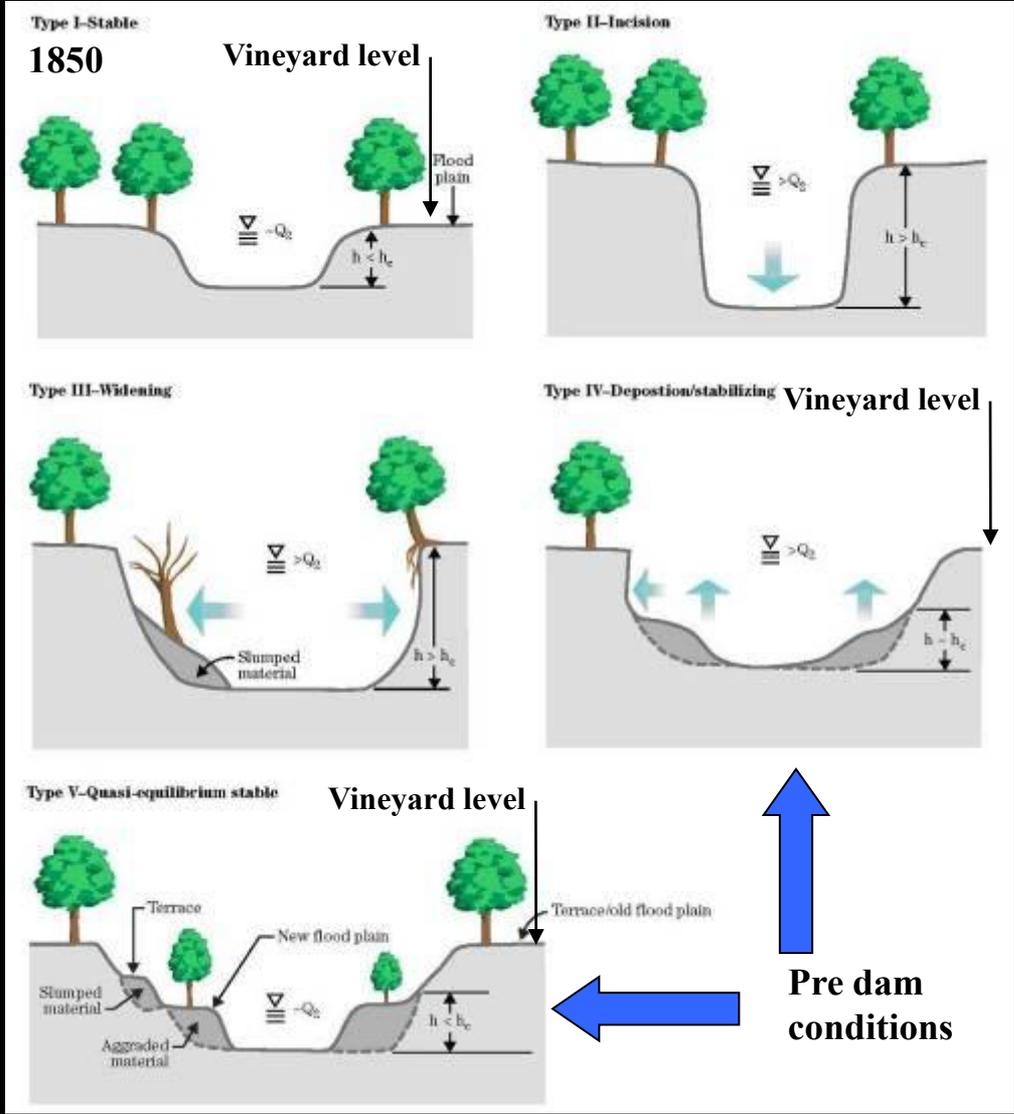
1952: Healdsburg Dam

1959: Coyote Dam

- Combined influences resulted in additional creek bed lowering by (10')
- Lowering of stream propagated up Dry Creek tributaries
- Effects slowed by mid-1980s



Watershed History Creek changes 1850 -1980s



Watershed History Creek changes 1984 – Today

1984: Closure of Warm Springs Dam

- flow patterns
- sediment patterns
- vegetation patterns



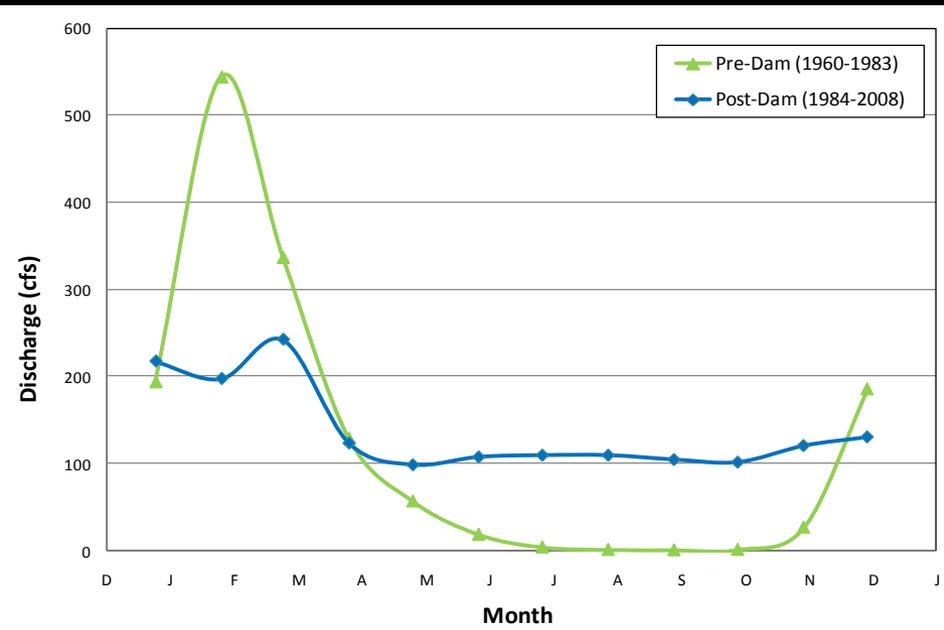
Stream Geomorphology Today

Flow patterns:

- reduced winter floods
- higher summer flows

Sediment patterns:

- cut off upper 60% of watershed
- moderated by supply from
Pena, Dutcher, Crane,
Mill Creeks



Stream Geomorphology Today

Vegetation patterns:

- combination of reduced winter floods and high summer flows resulted in extensive riparian growth
- stabilizes gravel bars
- focuses flow in channel



Fish Habitat

Inventory of 13.9 miles between WS dam and Russian River:

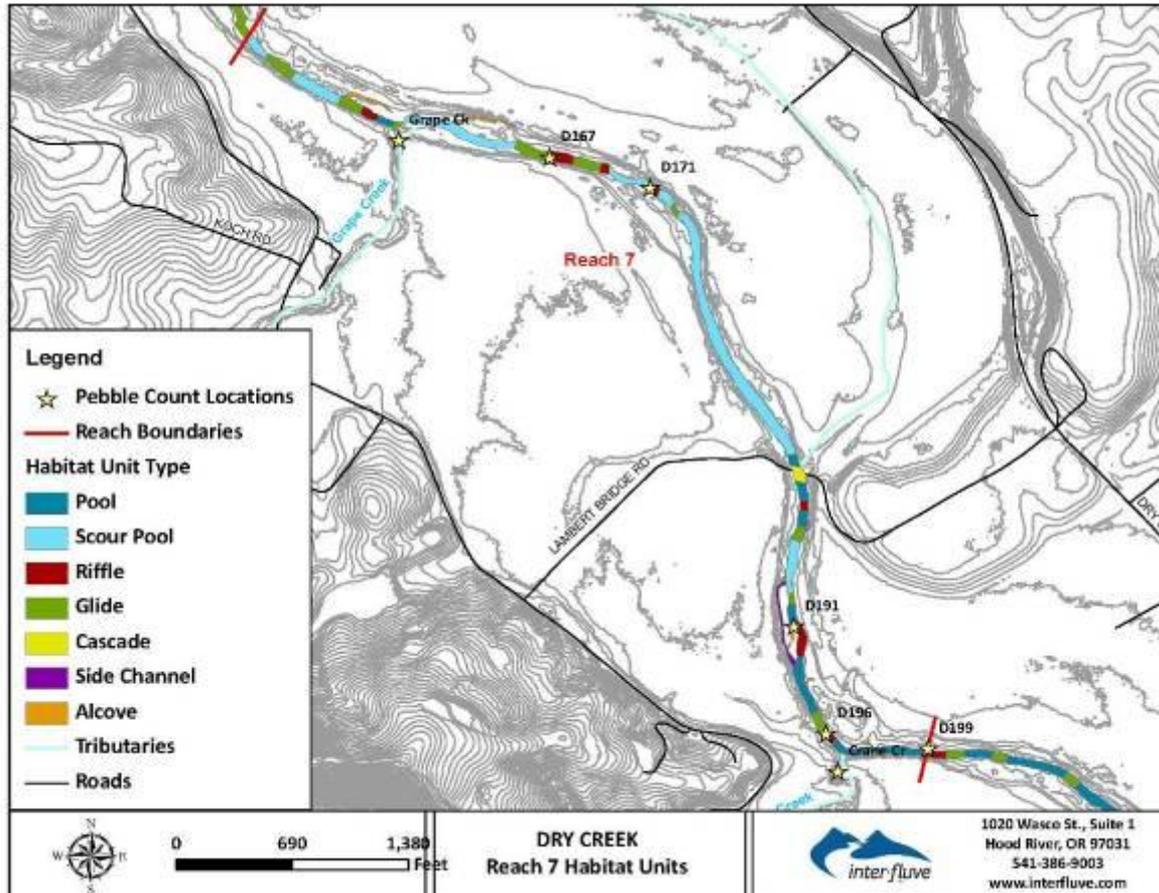
- Pools
- Riffles
- Glides
- Alcove and edge habitat



Fish Habitat

Inventory of 13.9 miles between WS dam and Russian River:

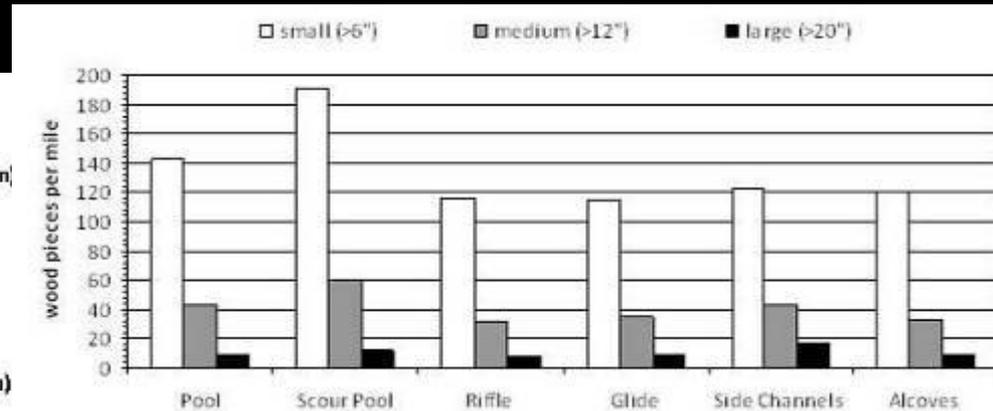
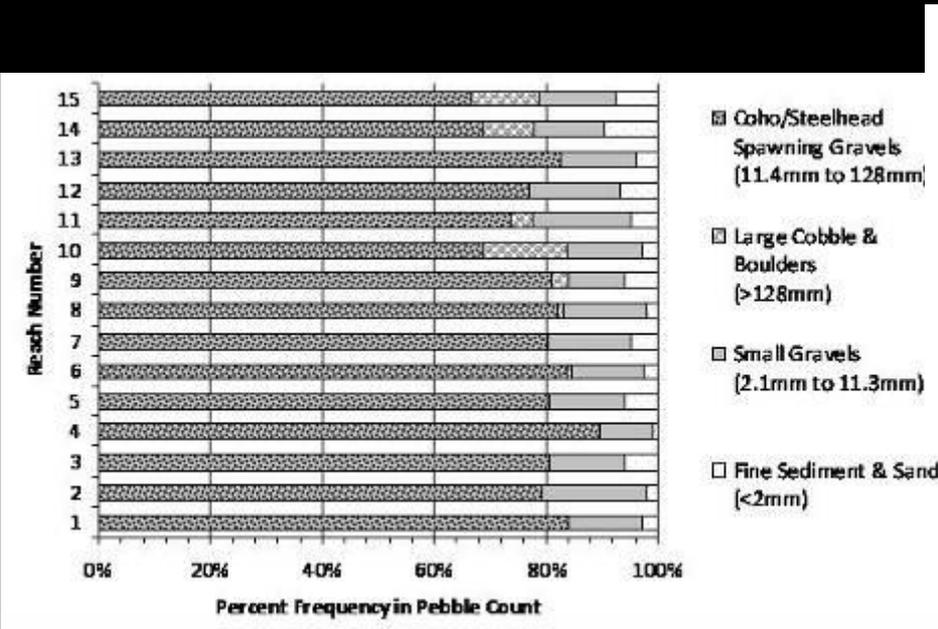
- Measured depths, widths, areas, cover, complexity, creek bed material, woody material
- Created maps for each segment of study reach (16 sub-reaches)



Fish Habitat

Selected Results (substrate and woody material):

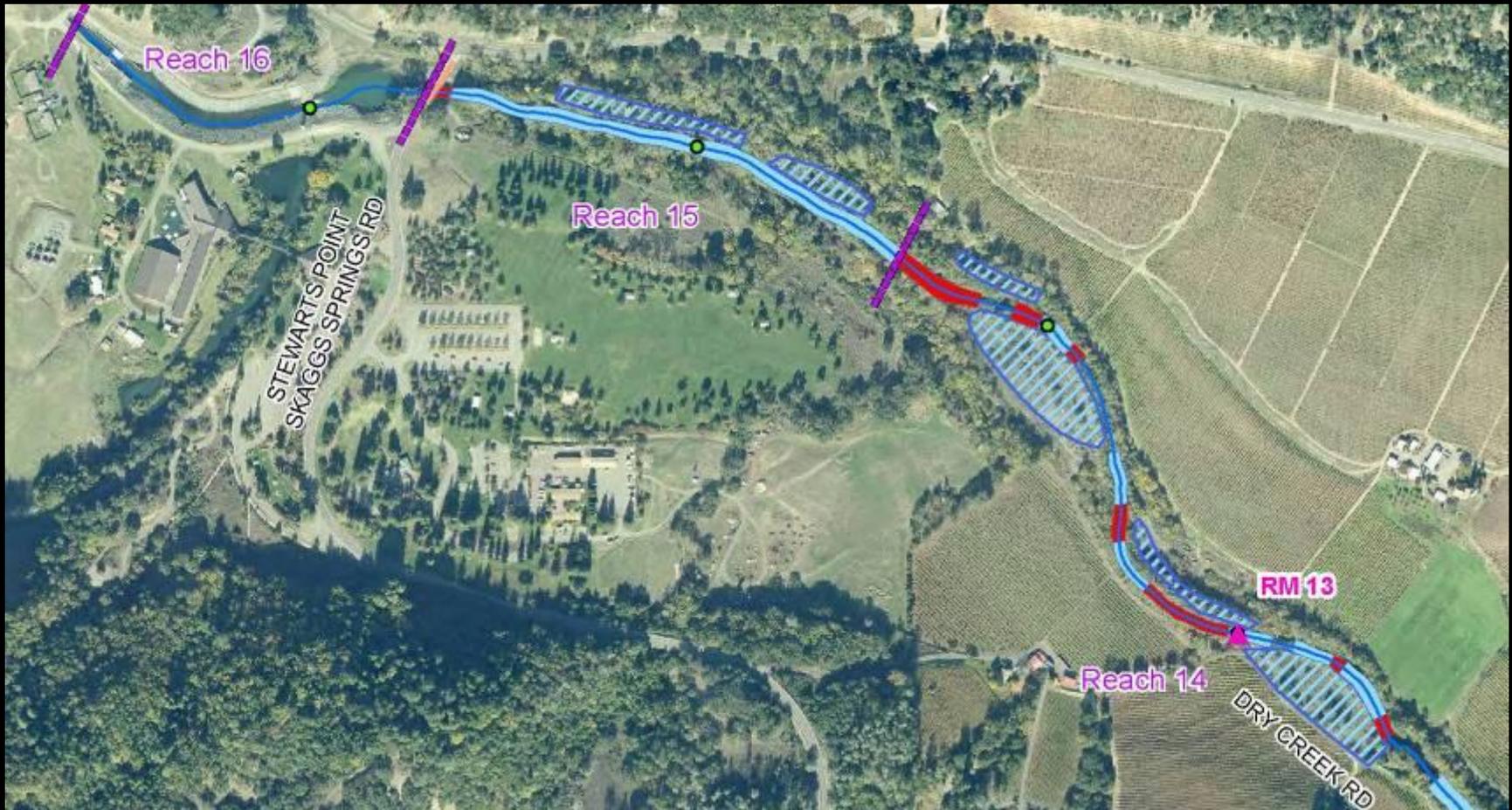
- Riffles had 80% of their gravels in target range for spawning
- Fine sediment in riffles low (<10%)
- Average of 209 pieces of woody debris per mile (pools, scour pools)
- 46% of woody debris pieces were living
- Alcoves most prevalent in lower half of study reach
- Edge habitat slightly more prevalent in lower half
- Overall habitat quality less than ideal, e.g., velocity



Opportunities for Fish Habitat Enhancement

Areas of interest for potential habitat enhancement identified

- Abundant opportunities for enhancement of pools, riffles, stream banks and creation of off-channel habitats
- All areas of interest within historic channel



Opportunities for Fish Habitat Enhancement

Potential enhancement applications

- Riffles – supplement gravel to increase area
- Pools – add/re-arrange woody materials to increase cover and complexity



Opportunities for Fish Habitat Enhancement

Potential enhancement applications

- Off-channel and alcove habitat creation



Opportunities for Fish Habitat Enhancement

Potential enhancement applications

- Stream banks – stabilization to enhance cover and complexity



Next Steps

Detailed Feasibility Analysis and Concept Designs

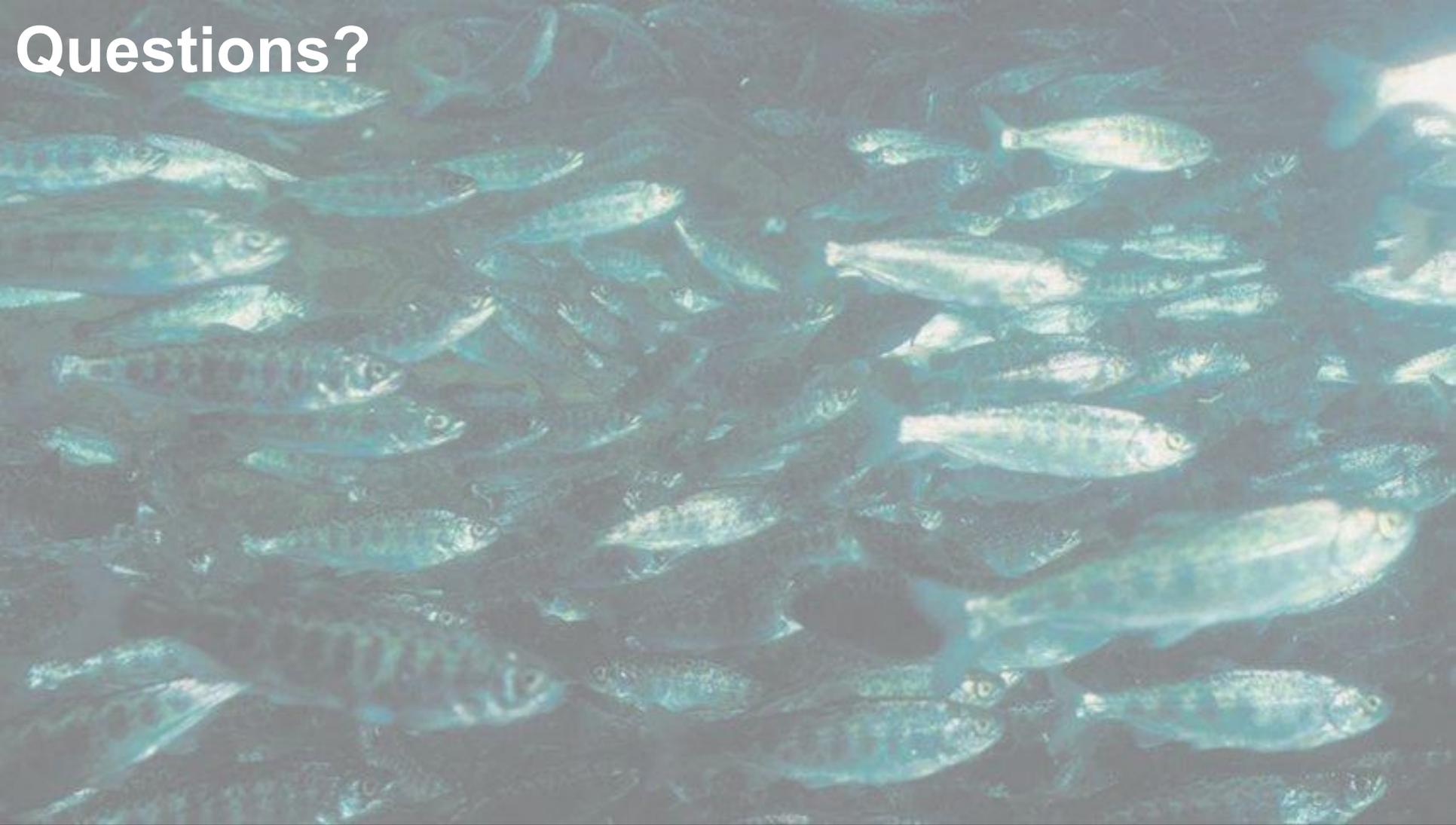
- System-scale feasibility
- Project-scale feasibility

Upcoming Schedule

- Spring – summer 2010: Detailed feasibility analysis
- Fall 2010: Concept designs and ranking of opportunities
- Summer 2011: Pilot project implementation



Questions?



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