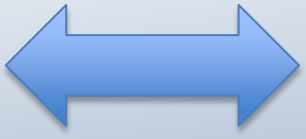
Concurrent Sessions C: Prioritization - Strategic Fish Passage Barrier Prioritization in the Tillamook - Nestucca Subbasin, Oregon

Prioritizing Fish Passage Barrier Removal at the Subbasin-scale: A Strategy for the Tillamook-Nestucca Subbasin

Steve Pilson and Dan Shively,
U.S. Fish and Wildlife Service

Photo credit: Tillamook Estuary Partnership



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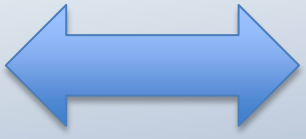


Outline

- Background: Tillamook-Nestucca Fish Passage Partnership
- Barrier Analysis Methods and Assumptions
- Results
- Products/Conclusions

Tillamook-Nestucca Fish Passage Partnership

- Began with a mix of federal and state stakeholders
- Move away from business-as-usual approach
- Organize projects strategically and with landscape/population-level goals
- Utilize new techniques for prioritizing (e.g. O'Hanley & Tomberlin, 2005; O'Hanley, 2011)

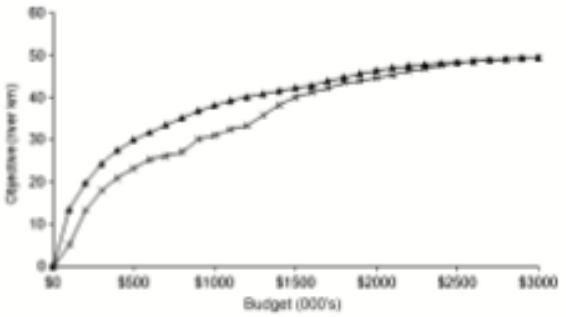


Figure 2. Comparison of the use of scoring-and-ranking (S&R represented by the crossed line) versus an optimal dynamic programming (DP represented by line and triangles) based approach proposed by O'Hanley and Tomberlin (2005) for prioritising barrier culvert removal in Washington State to maximise the net increase in accessible upstream habitat (river km) subject to budgetary constraints (adapted from O'Hanley & Tomberlin 2005).

Subbasin Setting

Goal

Determine where on the landscape fish passage restoration could make the most impact on fish populations. ("Optimize habitat gain")

Methods

General Approach:

- Build off existing local knowledge, datasets, and work
  - TEP Culvert Surveys
  - Oregon Fish Passage Barrier Database
  - Oregon Fish Habitat Distribution Layers
  - Local biologist knowledge
  - Extrapolate cost estimates from previous projects
- Run barrier data through an optimization model – Jesse O'Hanley's APASS

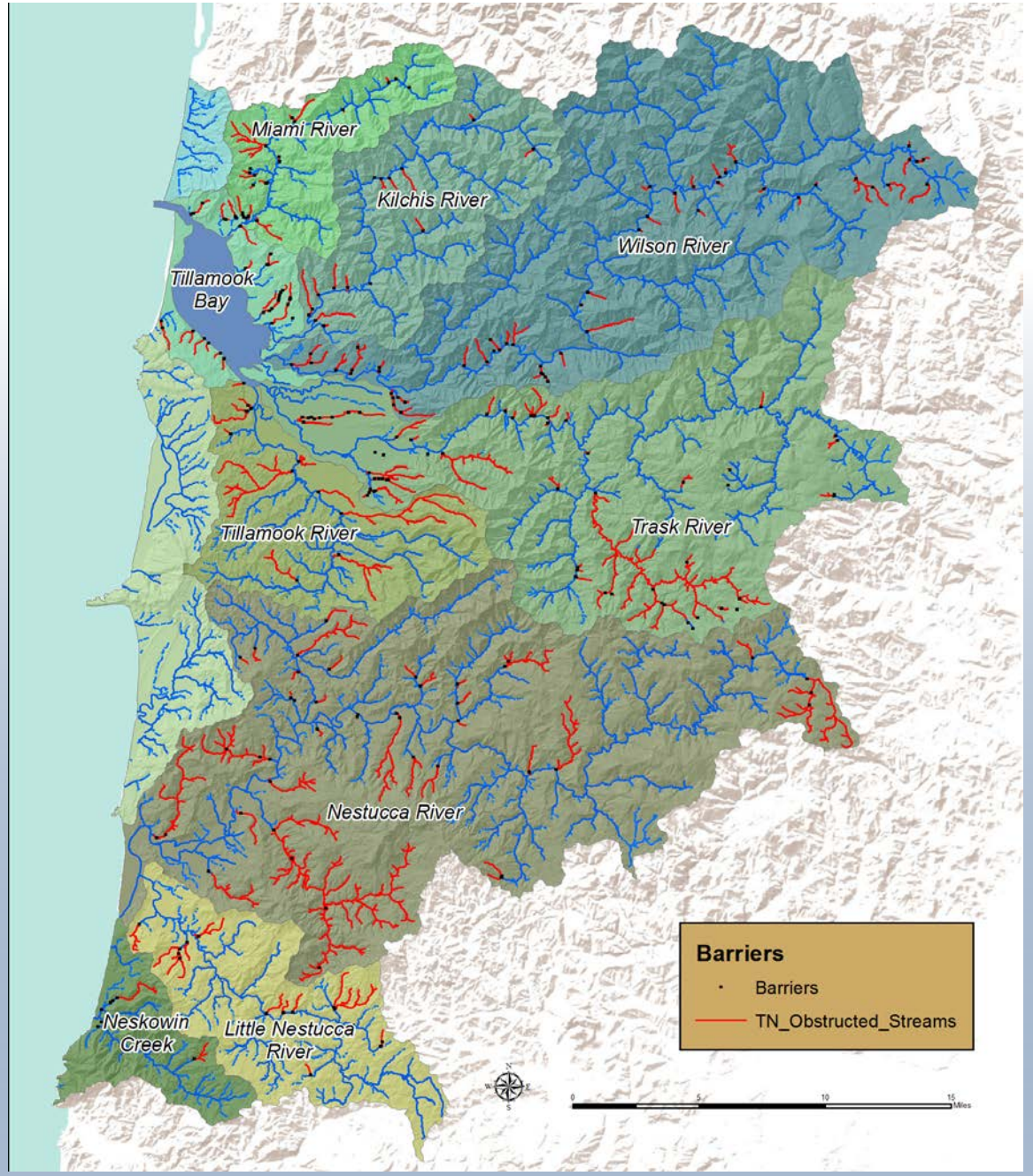
APASS Inputs Needed

- BARID & DSID – Where are they, upstream/downstream relationship
- CAND – culverts, dams, tidegates vs. waterfalls
- PASS – how much of a barrier?
- USHAB – how much habitat is upstream to next barrier or end of anadromy?
- COST – how much would it cost to restore passage for juvenile salmonids?

Analysis

- To arrive at rankings, ran APASS in “batch mode,” letting it iteratively solve for best solution at cost increment, then arranged output in frequency order
- Broke ties by ordering from downstream to up, and then by cost/mile
- Did this for 3 tiers
  - Projects already planned (20)
  - Short-term investment package (66)
  - Long-term investment package (189)

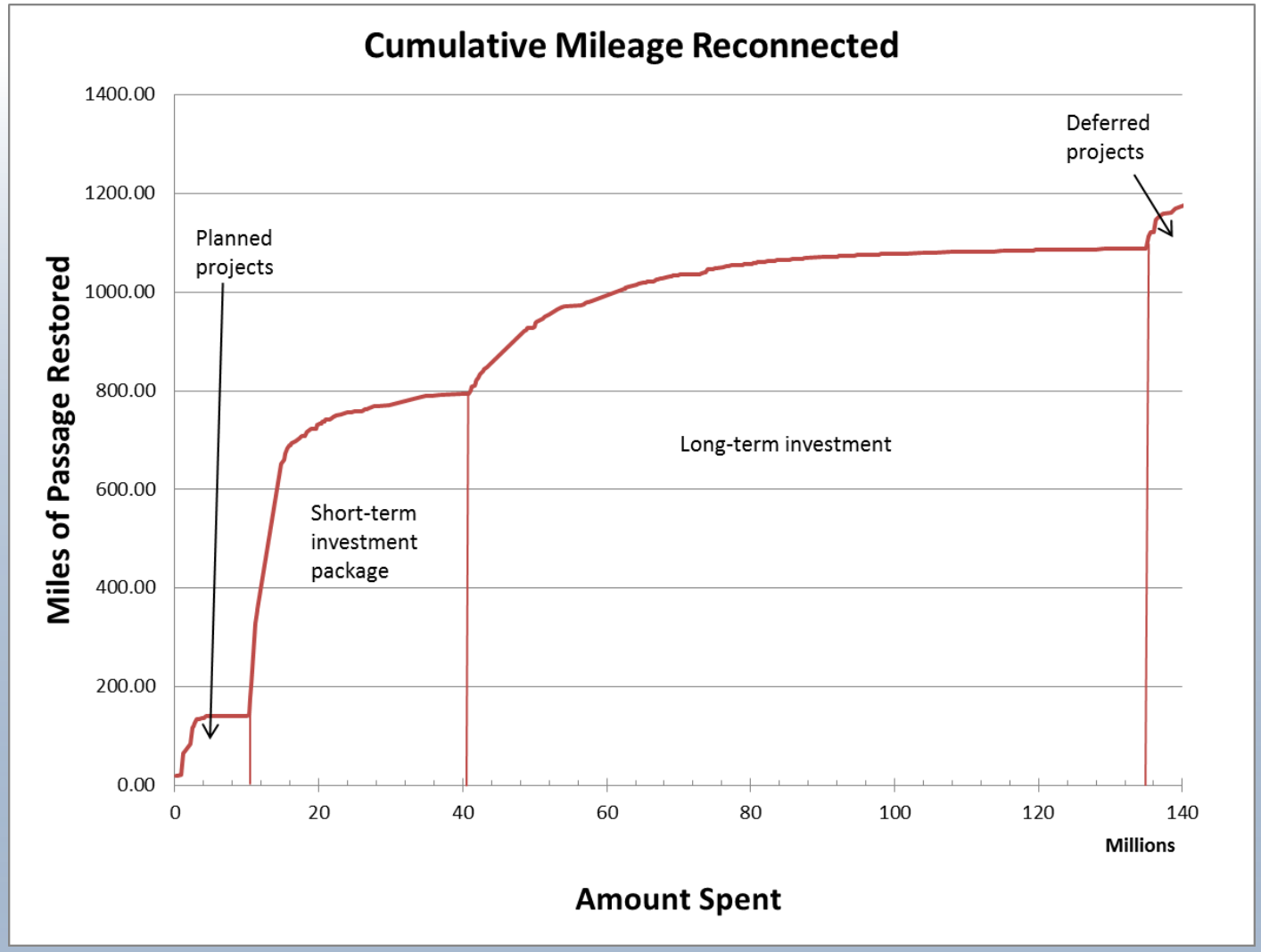
Barriers


Miami River
Kilchis River
Wilson River
Tillamook Bay
Tillamook River
Trask River
Nestucca River
Neskowin Creek
Little Nestucca River
Barriers
Barriers
TN_Obstructed_Streams
0
5
10
15
Miles

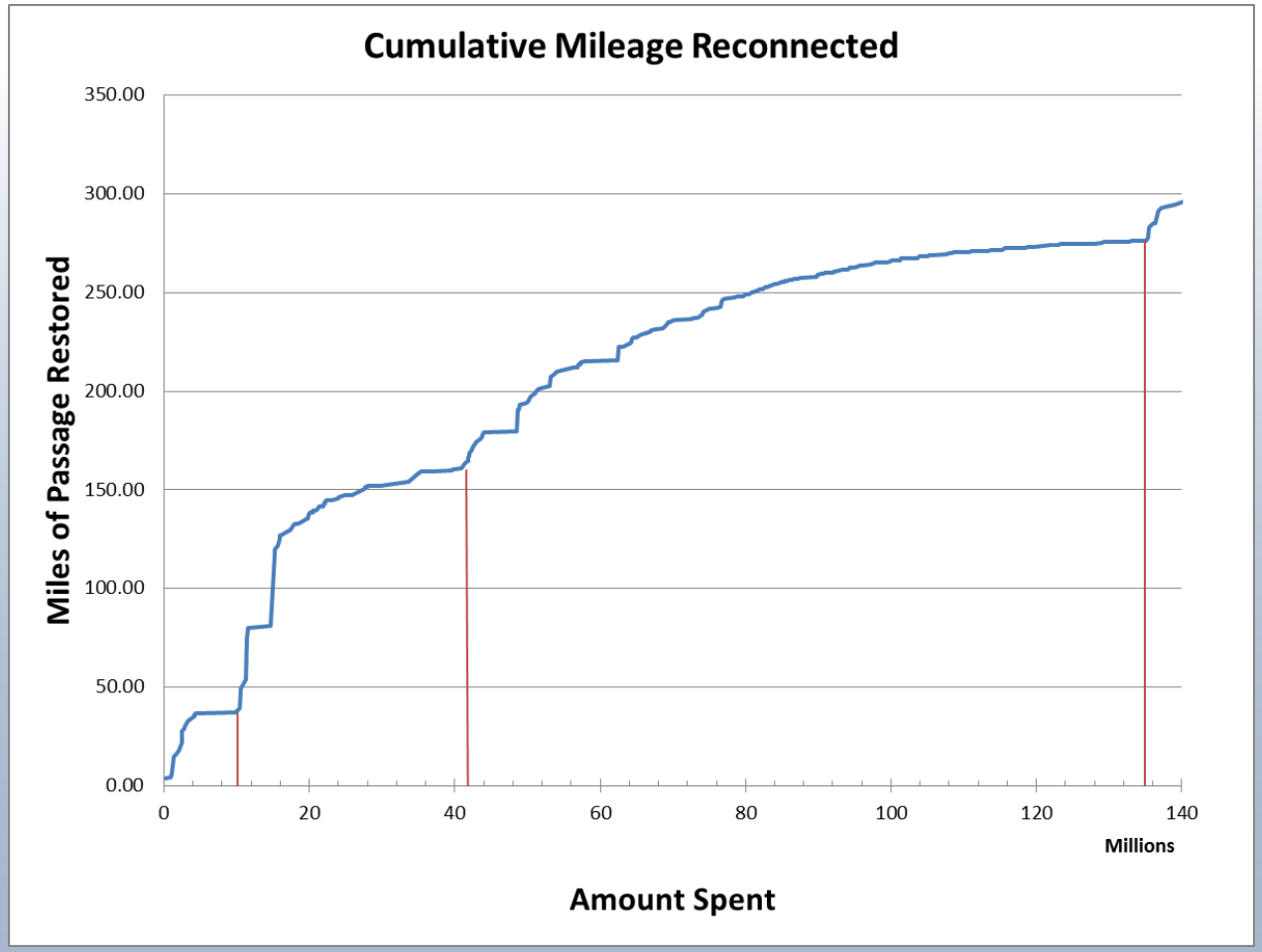
Results

- A rough guide to where and in what order restoration of fish passage should take place.
- Honors the work of local partners by respecting their already planned/initiated projects and recent prioritization of 63 culvert barriers as being most important to address
- Provides a way of quantifying progress at the subbasin scale, that of the two bays, or individual watersheds – Can we achieve population-level distribution goals?

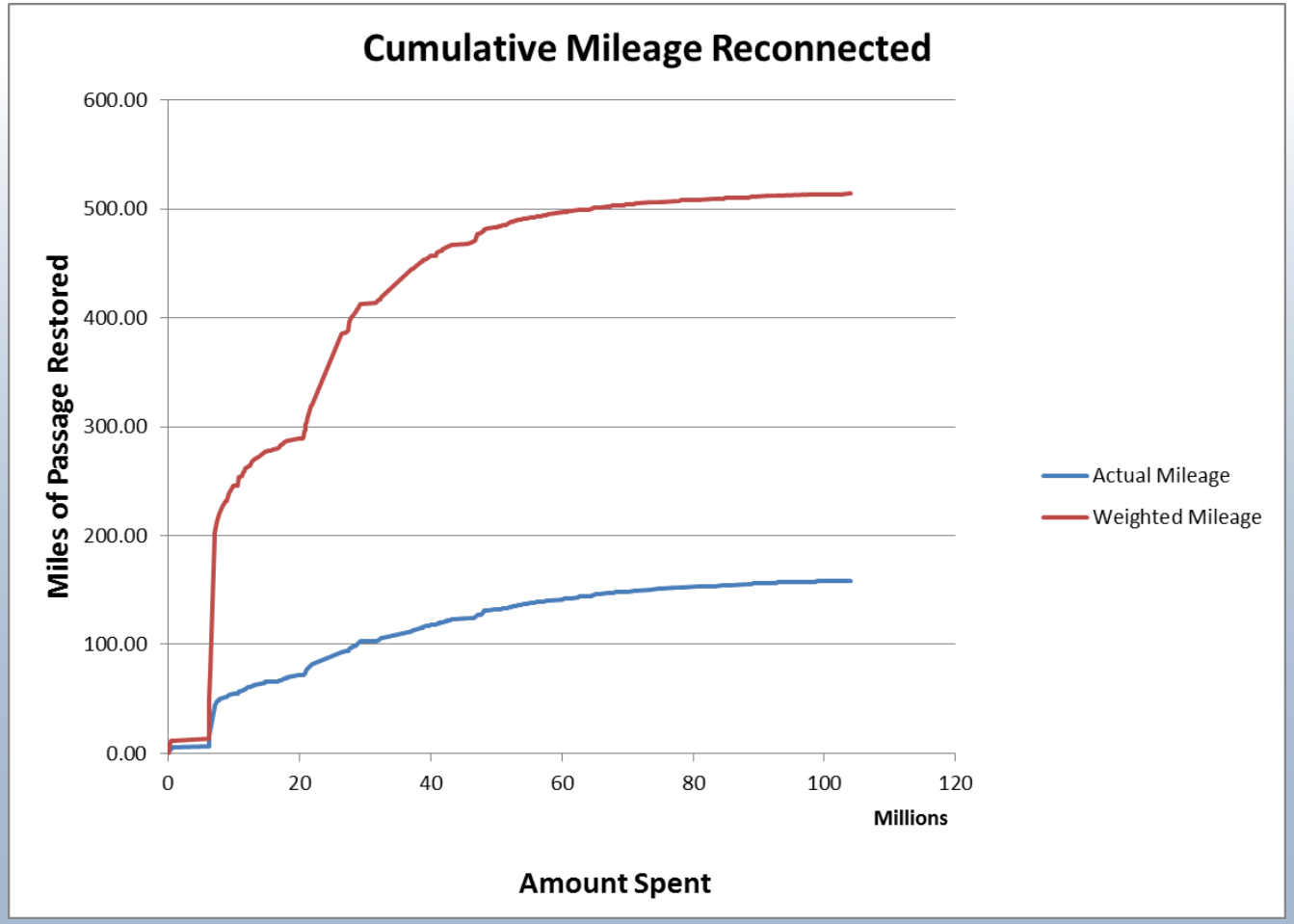
Results – Whole Subbasin, Weighted Mileage



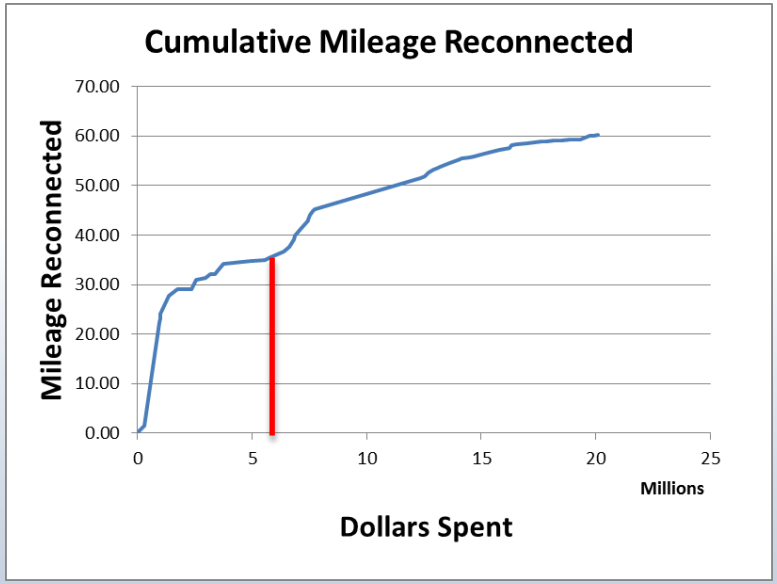
Results – Whole Subbasin, Act. Mileage

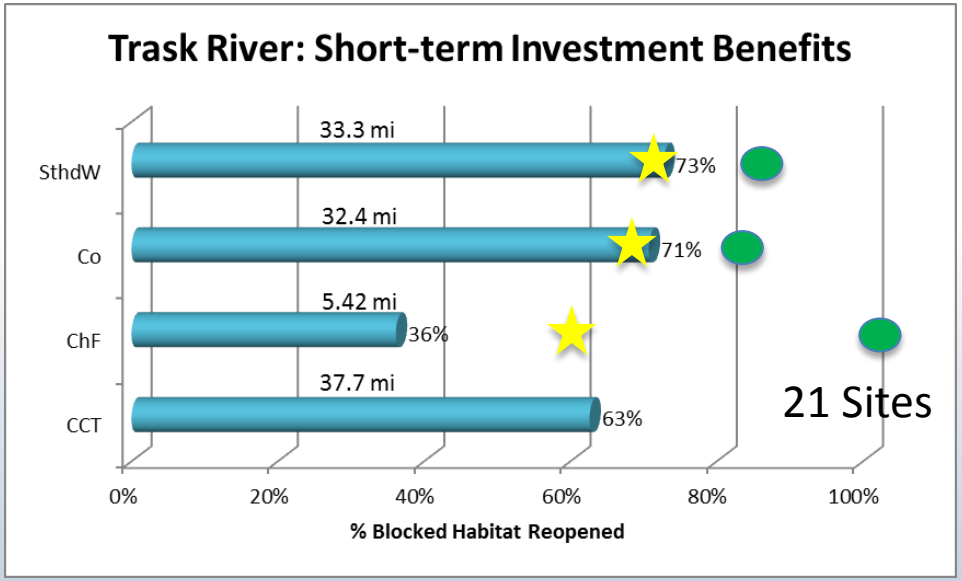


Population Level Results – Tillamook Bay System



Trask River: Specific Results



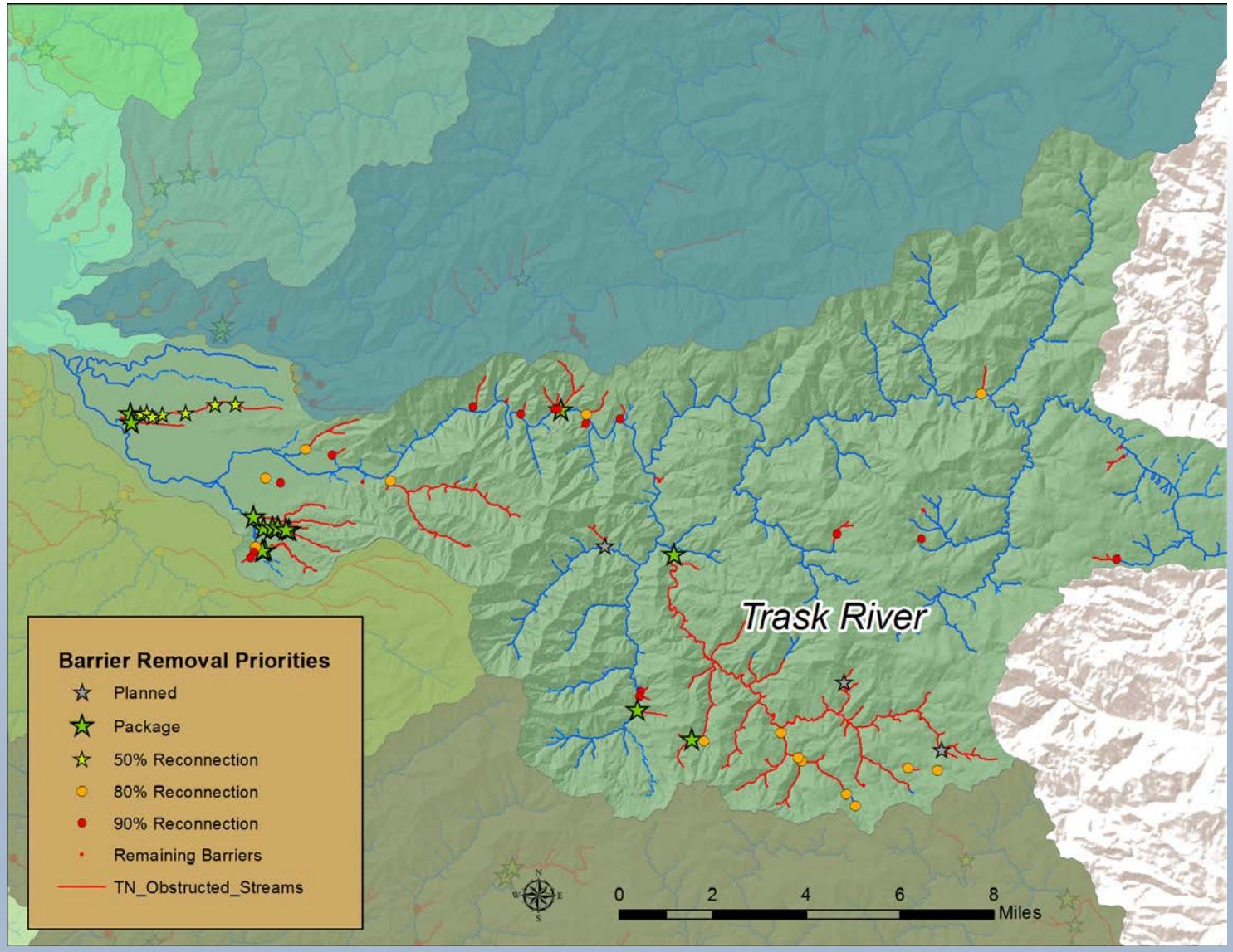


90% Pop. Goal 95% Pop. Goal

Site #	Road	Stream	Est. Cost	Upstream Habitat	Species Benefitted
D4	NA	E Fk S Fk Trask R.	$500,000	20.9 mi	Co, SthdW, CCT
1402	S Fk Trask Rd	Unnamed Trib	$45,500	0.7 mi	Co, CCT
1448	E Fk Bypass	Bales Cr	$13,000	1.1 mi	CCT
1094	Brickyard Rd	Unnamed Trib	$357,500	10.5 mi	Co, SthdW, CCT
…	…	…	…	…	…

Co = coho, ChF = fall Chinook, SthdW = winter steelhead,, Chm = chum, CCT = coastal cutthroat trout

Trask River: Specific Results



Concerns/Caveats

"All models are wrong, but some are useful." – George E.P. Box, statistician

- Not all barriers are equal, some may pass fish in most flows
- Stream mileage is not a substitute for amount of actual usable habitat for a species
- Costs are estimated and may vary
- Our prioritization is economics-based; other factors such as habitat quality, infrastructure condition, or socio-political considerations will likely be important

Conclusions

- This process/analysis yields several key benefits:
  - Understanding of Overall Context
  - Barrier-Specific Cost Estimates
  - Landscape-scale Roadmap for Reconnecting Habitat
  - Ability to develop an investment portfolio targeting species-specific population level goals
- This approach joins valuable on-the-ground work to its wider context in a way that will help in telling/selling the fish passage restoration story of the subbasin

Questions?

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