

Analysis of Genetic Variation in Upper Willamette River Bull Trout Populations



Patrick DeHaan
U.S. Fish and Wildlife Service
Abernathy Fish Technology Center, Longview, WA

Bull Trout

Salvelinus confluentus

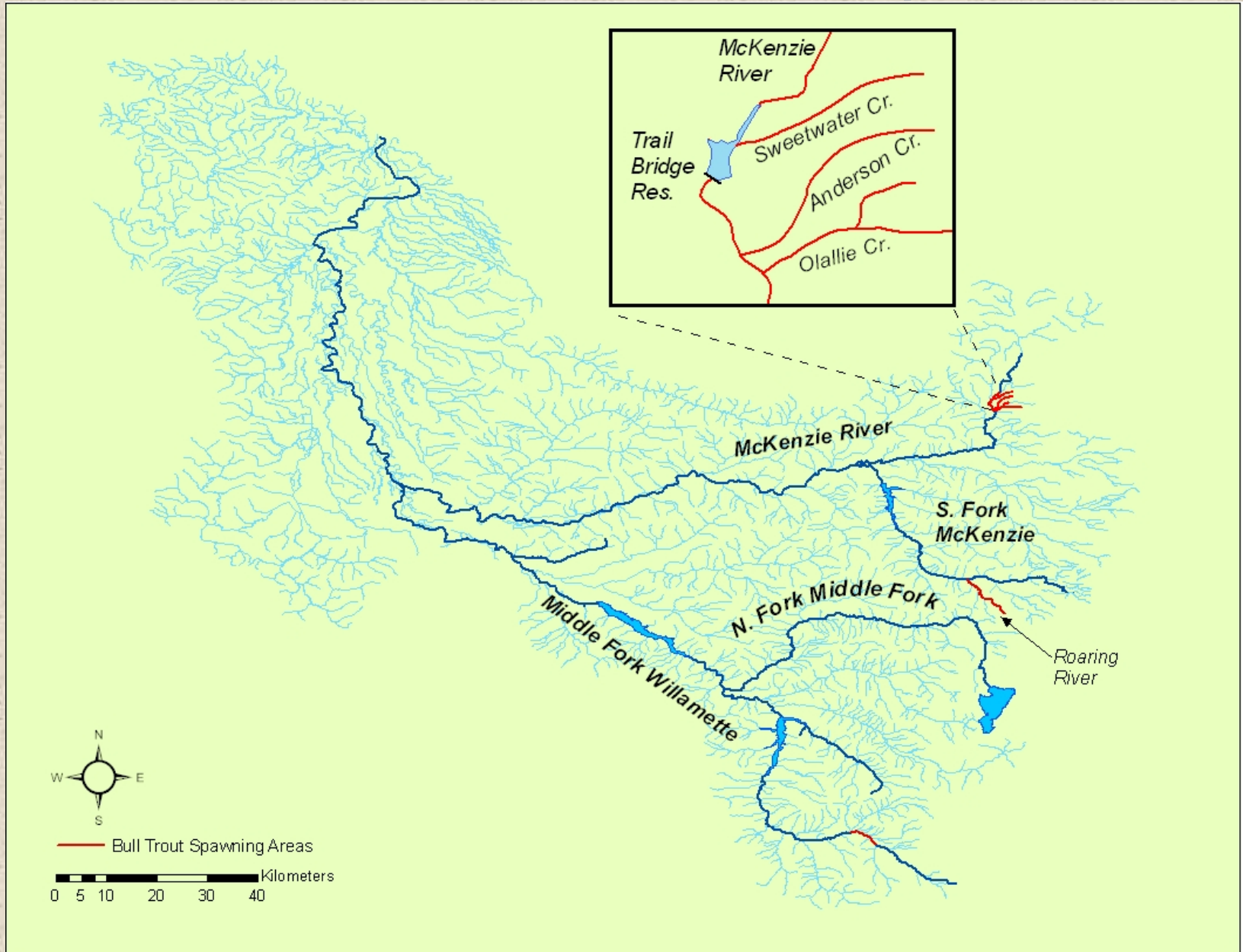
- Currently listed as threatened – USFWS 1999
- Factors limiting recovery include:
 - Threats from non-native species – competition, hybridization
 - Availability of suitable habitat patches
 - Connectivity among habitat patches



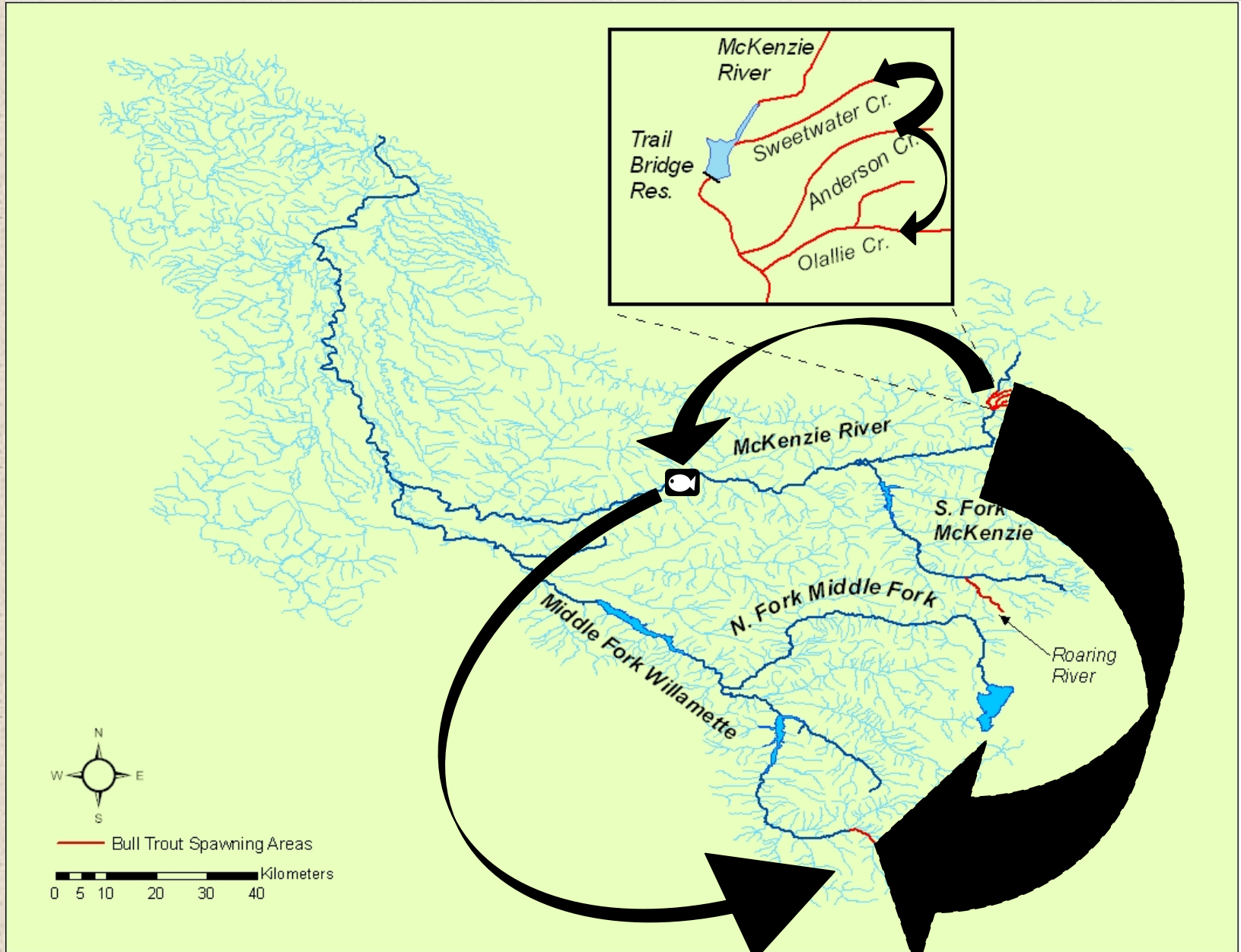
Willamette Bull Trout -Background-

- USFWS draft recovery plan recognizes 4 populations
 - Mainstem McKenzie, Trail Bridge, S. Fork McKenzie, Middle Fork Willamette
- Bull trout extirpated from the Clackamas and Santiam Rivers
- 3 of 4 populations located above dams
 - No fish passage at any of these dams

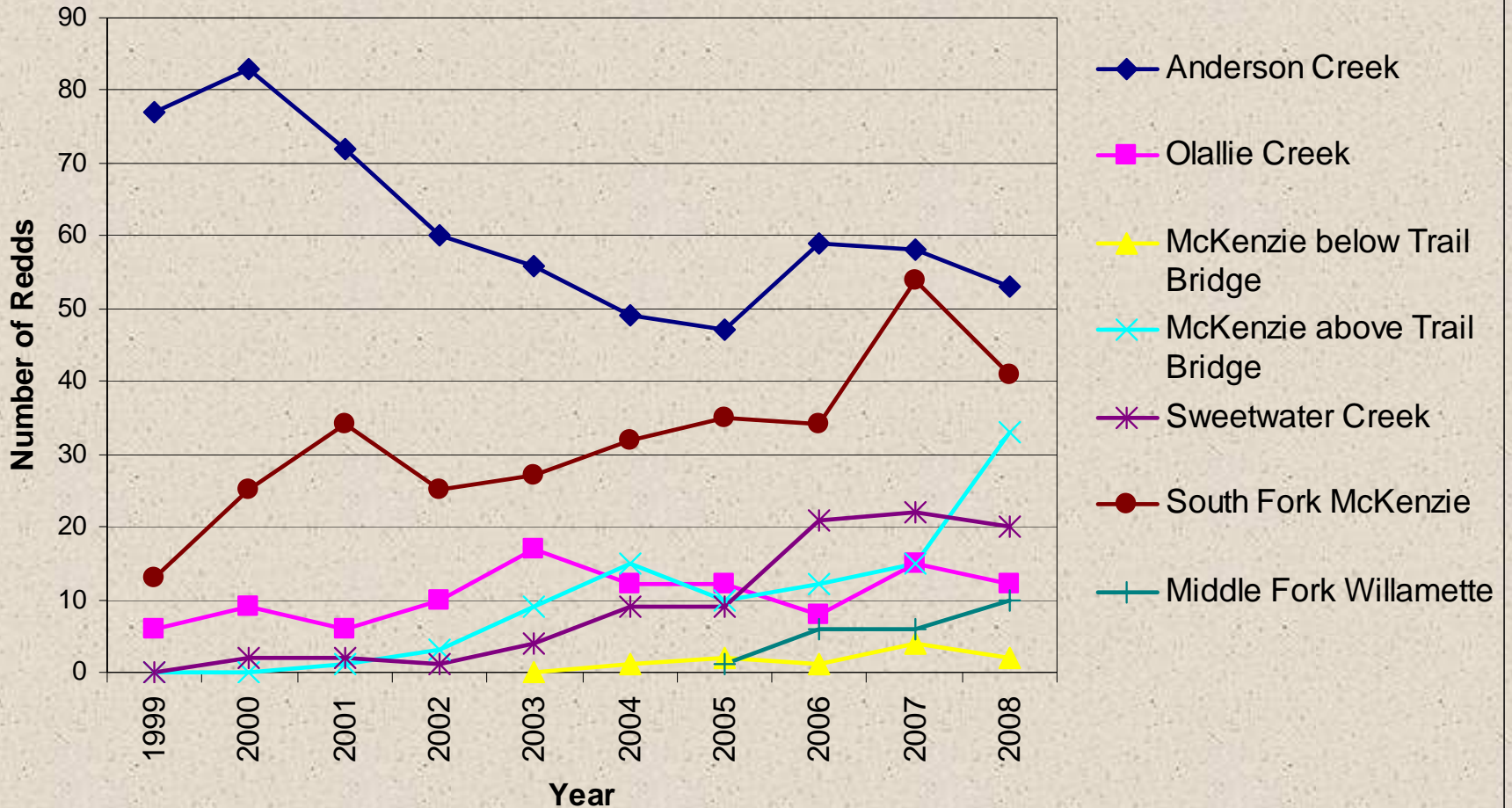
Willamette Bull Trout Populations



Fry Transfers



Willamette River Bull Trout Redd Counts



Data provided by ODFW and Willamette National Forest

Question

Although some populations have begun to rebound following management activities, what effects have these activities had on levels of genetic variation?



Levels of Genetic Variation

- What are the levels of genetic variation within and among the four populations?
- What is the genetic relationship among populations and how have management activities affected these relationships?

Fry Transfers

- Presently transfers of fry provide the primary means of connectivity among populations
- Which populations should be considered for receiving fry?
- Which populations should be used as donors?



Hatchery Rearing

- Since 2006 fry from Anderson Cr. have been reared in a hatchery prior to being transferred to the Middle Fork Willamette
- Are levels of variation observed in the wild population represented in the hatchery fish?
- What can be done to maintain genetic variation and maximize effective population size?

Methods

- Up to 50 juvenile bull trout sampled from each spawning tributary
- Genetic samples from fish taken to Leaburg Hatchery
- All samples genotyped at 16 microsatellite loci
- Data analysis currently under way
- Draft report completed by March 31, 2009

Genetic Management Plan

Questions

- When should we transfer fish?
- How many fish to transfer?
- Over what time period?
- What source populations do we use?
- What life stage should we transfer?
- How do we collect fish for transfers?



Acknowledgements

- Funding provided by U.S. Army Corps of Engineers
- Genetic Samples collected by USFS-Willamette National Forest, ODFW, Stillwater Sciences
- Redd count data provided by V. Tranquilli (ODFW) and K. Meyer (USFS)
- Laboratory assistance provided by Matt Diggs

