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July 6, 2016

MEMORANDUM

TO: **Fish and Wildlife Committee members**

FROM: **Kendall Farley**

SUBJECT: **Development of Wild Steelhead gene banks in Washington State**

BACKGROUND:

Presenters: Erik Neatherlin – Fish Program Science Manager for the Washington Department of Fish and Wildlife.

Summary: The Washington Department of Fish and Wildlife (WDFW) developed a Steelhead Management Plan to restore and preserve this species and initiate a multi-step process to improve the management and status of steelhead in Washington. The highest priority in the Plan is the protection of wild steelhead stocks; the plan also includes a strategy to establish a network of wild stock gene banks. The wild stock gene bank strategy is very similar to the Council's stronghold strategy. Erik Neatherlin will provide the Council with an update on the process of establishing wild stock gene banks in Washington.

Relevance: The Council's 2014 Fish and Wildlife Plan Council (2014-12) has a strongholds strategy to designate and conserve stronghold wild populations and their habitat, which may require the least amount of risk and investment to provide the greatest benefits to the program and for sustainable, wild, and natural-origin populations of fish. Based on current understanding, establishing strongholds may be critically important to

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protect the remaining viable wild or natural-origin fish populations and to restore habitat with the potential to re-establish core populations at strategic locations in the basin (Columbia River Basin Fish and Wildlife Program; p. 44).

Wild Steelhead Gene Banks in Washington State

Washington Department of FISH and WILDLIFE

Erik Neatherlin, Fisheries Science Director
Northwest Power & Conservation Council
Fish Committee Meeting
July 12, 2016

What is a Gene Bank?

Watershed with no hatchery releases where a wild stock (population) is largely protected from the effects of hatchery programs

Hatchery Effects

- **Genetic**
  - Hatchery fish have lower fitness than wild fish
  - Hatchery / wild interbreeding
  - Reduced fitness of wild populations

- **Ecological**
  - Competition
  - Predation

Approaches to Offset Negative Effects of Hatcheries

- **Change Hatchery Operations**
  - Remove hatchery fish from spawning grounds, reduce disease, reduce crowding, etc.
- **Reduce Hatchery Production**
  - Align hatchery program size with program goals – harvest mitigation, conservation ,etc.
- **Establish Gene Banks**
  - Eliminate hatchery releases

Benefits of Gene Banks

- **PROTECT** genetic diversity and eliminate hatchery/wild fish competition
- **CONSERVE** populations while they are still healthy rather than relying on restoration
- **BUFFER** natural populations against extinction from catastrophic or natural events (volcanic eruptions, fires, ocean conditions, climate change)
- **ACT AS REFERENCE** populations for restoration and recovery

Gene Banks Analogous with Stronghold Concept

- **Wild Steelhead Gene Bank (WDFW)**
  - Largely protected from the effects of hatchery programs
  - Self-sustaining wild populations buffered from human impacts
  - Fisheries are permitted consistent with management objectives

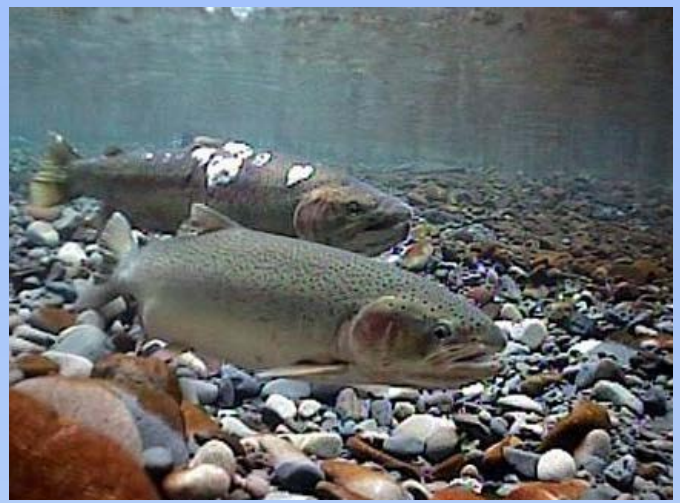
- **Stronghold Principles (NPCC)**
  - Ability to manage for wild fish while minimizing impacts of hatchery fish (e.g. genetic stronghold)
  - Healthy and abundant wild population, relatively intact habitat with a low risk of habitat degradation, relatively good ecosystem function, and encompass areas large enough to withstand human disturbances
  - Adequate buffers to shield them from non-native, invasive species

- **Stronghold (Wild Salmon Center)**
  - Proposed designations based on viability, percent natural origin spawners, and life history diversity

Wild Fish Gene Banks or Strongholds Not a New Concept

- Long history of not stocking hatchery fish and the recognition of the importance of wild fish management through individual actions
- Idaho Department of Fish and Game designated wild fish management zones for in wilderness areas in Salmon and Clearwater in the 1980's
- Oregon Department of Fish and Wildlife designated wild fish emphasis areas where no hatchery fish of any species are released in its latest coastal conservation plan
- Declining stocks, ESA, and WDFW policies led to development of gene banks in Washington State

Shifting Legal and Policy Landscape



- 1990's Federal ESA Listings
- Mid-2000's
  - Hatchery Scientific Review Group
  - Fishery and Hatchery Reform

WDFW Policies and Guidelines

- **Statewide Steelhead Management Plan (SSMP) (2008)**
  - Developed from Statewide Steelhead Assessment
  - Requires development of steelhead watershed management plans
  - Established the requirement for a network of gene banks

- **Fish and Wildlife Commission – Fishery and Hatchery Reform policy (2009)**
  - Requires WDFW to follow HSRG principles for hatcheries
  - Also required network of gene banks

- **Recovery plans (2010+)**
  - LCFRB prioritized populations and set recovery goals

Statewide Steelhead Management Plan GOAL

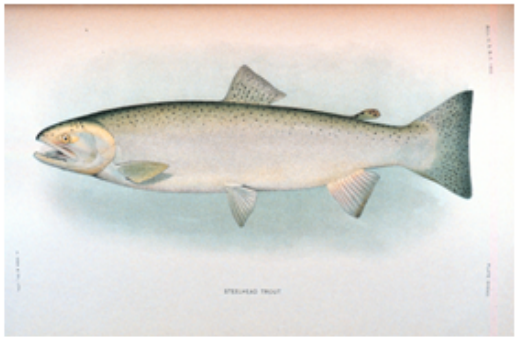
"Restore and maintain the abundance, distribution, diversity, and long-term productivity of Washington's wild steelhead and their habitats to assure healthy stocks…"

Establish Network of Wild Steelhead Gene Banks

- At least one (1) per Major Population Group (MPG) per Distinct Population Segment (DPS)

WDFW Early Approach for Gene Bank Designations

- Informal gene bank designations through elimination of hatchery release
  - Toutle winter steelhead after eruption of Mt. St.Helens in 1980
  - Wind River summer steelhead in late 1990's
  - Asotin Creek summer steelhead in 2000's.
- In 2008 WDFW completed a Assessment of Steelhead Populations and Programs
  - Highest priority was the protection of wild steelhead stocks



Oncorhynchus mykiss:
Assessment of Washington State's Steelhead Populations and Programs

Edited by
James B. Scott, Jr.
William T. Gill

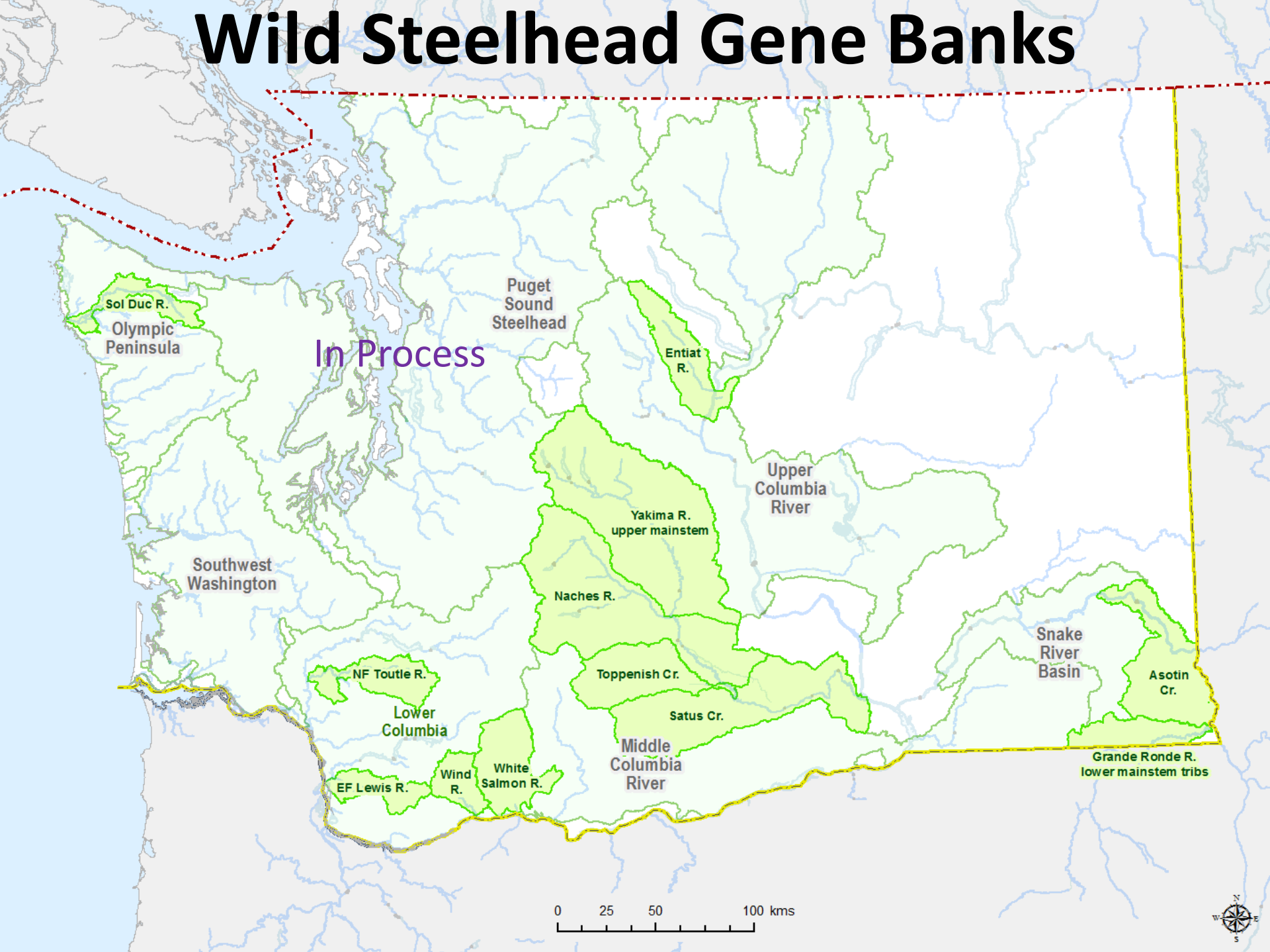
Washington Department of Fish and Wildlife
Olympia, Washington

February 1, 2008

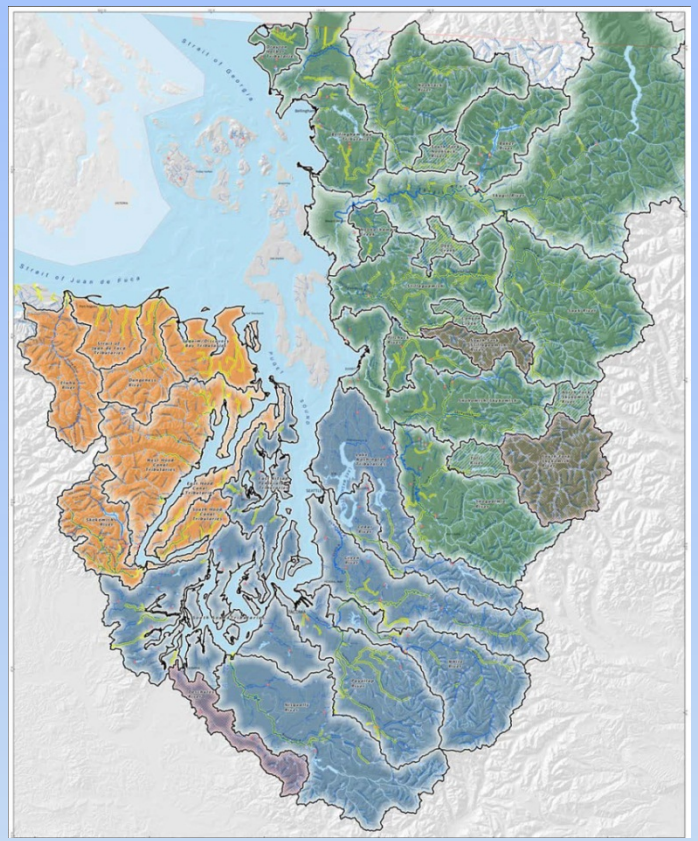
Current Wild Steelhead Gene Bank Designation Process

- Tailored to Each Geographic Region
- Public Process
  - Introductory public meetings
  - Formation of workgroup / stakeholder group to develop gene bank recommendations
  - Announcement of recommendations with public comment period
  - Summarize comments & develop recommendations
- Formal adoption by Director / Commission

Wild Steelhead Gene Banks



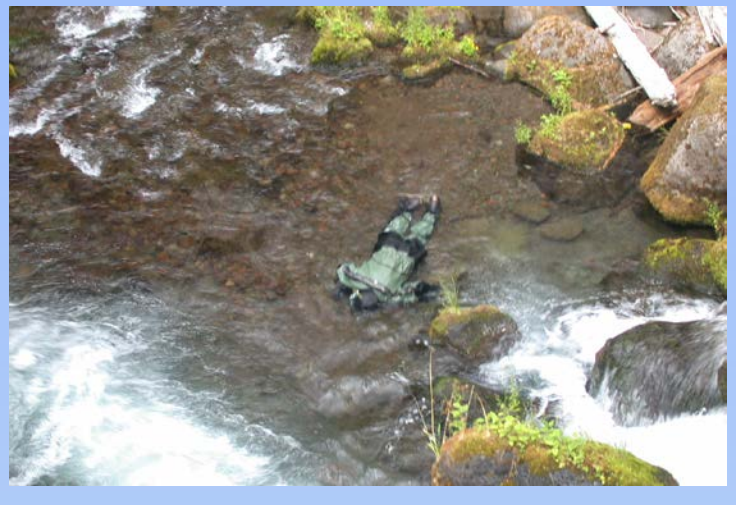
Next Steps



- Announce WSGB in Puget Sound
- Comment and review period
- SW Washington

Are they Working?
Ongoing Monitoring & Evaluation

- Abundance
  - Fish in/Fish out
  - Hatchery and natural origin
- Productivity
  - Fresh water productivity
  - Life stage survival & productivity
  - Marine survival
- Spatial Structure & Diversity
  - Genetic analyses
  - PIT tags
  - Radio telemetry



Thank you

Washington Department of FISH and WILDLIFE