

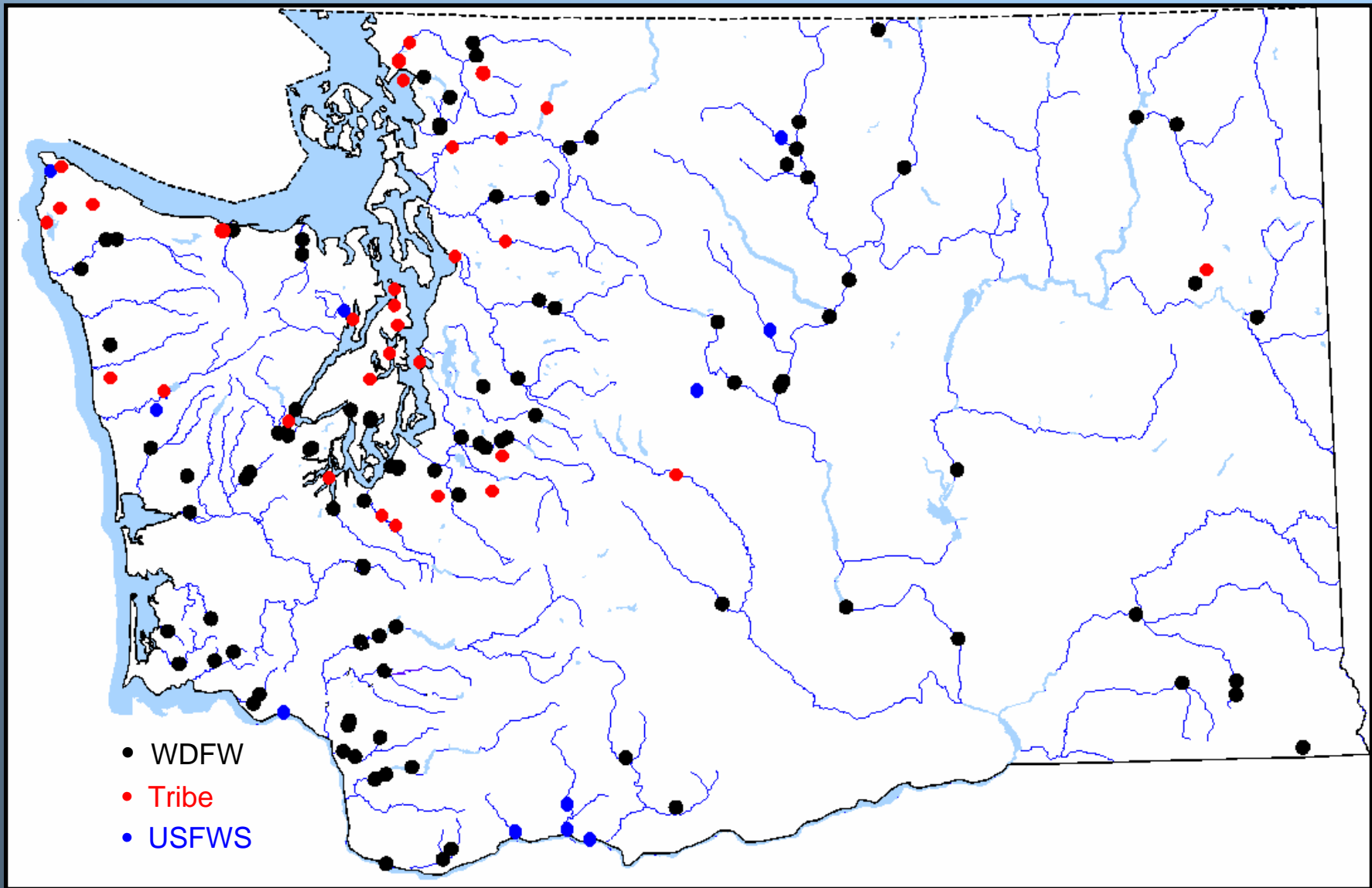
Applying Science to Hatchery Management

Hatchery Scientific Review Group



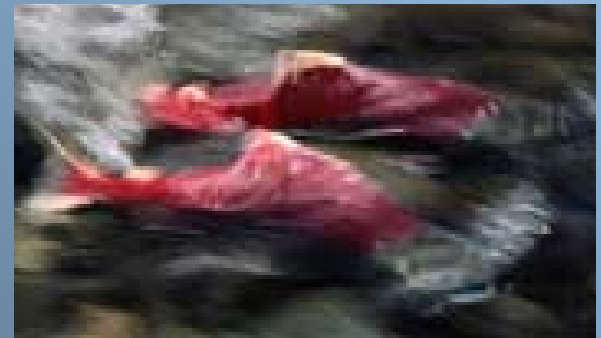
October 2005





The Hatchery Reform Project is a systematic, science-driven review of hatchery programs to achieve two goals:

- 1) helping conserve naturally spawning populations; and*
- 2) supporting sustainable fisheries.*



Hatchery Scientific Review Group

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NW Indian Fisheries Commission

Lee Blankenship (Vice Chair)

Northwest Marine Technology

Donald Campton, PhD

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Conrad Mahnken, PhD

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Mobrand Biometrics

Lisa Seeb, PhD

Alaska Department of Fish & Game

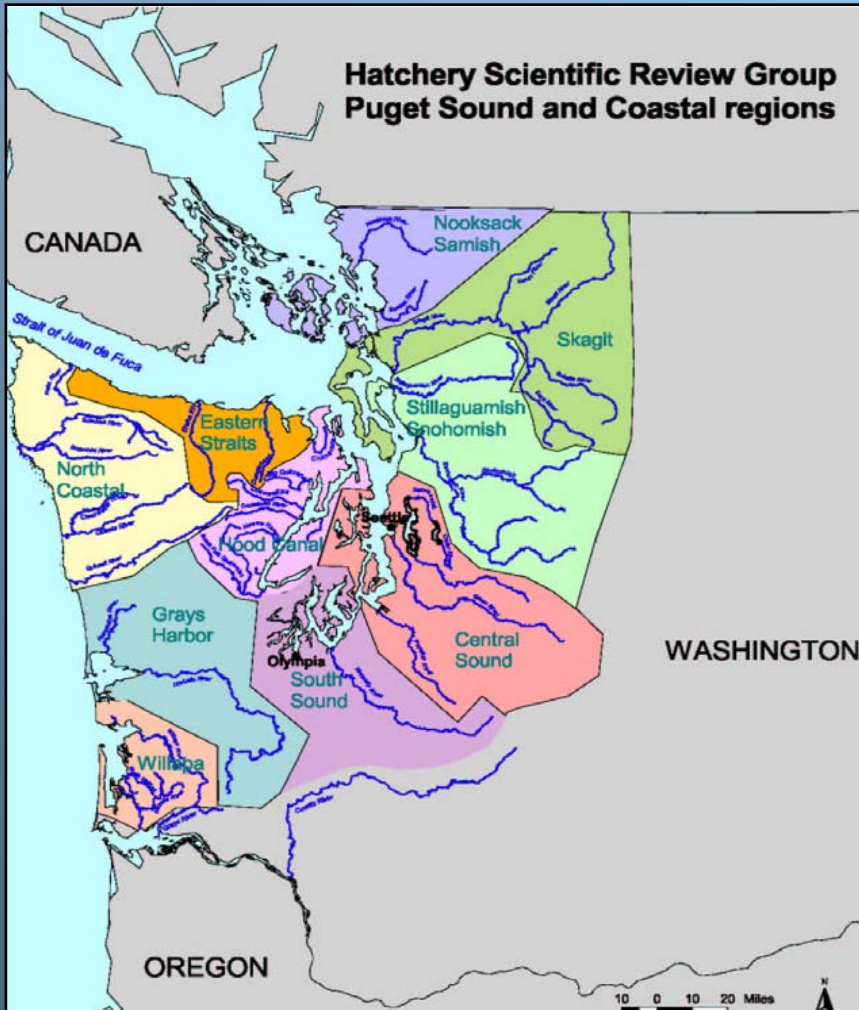
Paul Seidel

WA Department of Fish and Wildlife

William Smoker, PhD

University of Alaska





2001 Regions

- Eastern Strait of Juan de Fuca
- South Puget Sound
- Stillaguamish/Snohomish Rivers

2002 Regions

- Skagit River Basin
- Nooksack/Samish Rivers
- Central Puget Sound

2003 Regions

- Hood Canal
- Willapa Bay
- North Coast
- Grays Harbor

REGIONAL REVIEWS



HATCHERY REFORM
Principles and Recommendations
of the
Hatchery Scientific Review Group

April 2004

Principles for Hatchery Management

GOALS

SCIENTIFIC
DEFENSIBILITY

INFORMED
DECISION MAKING

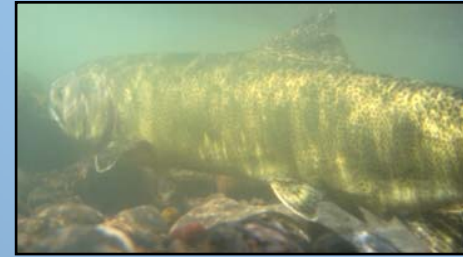
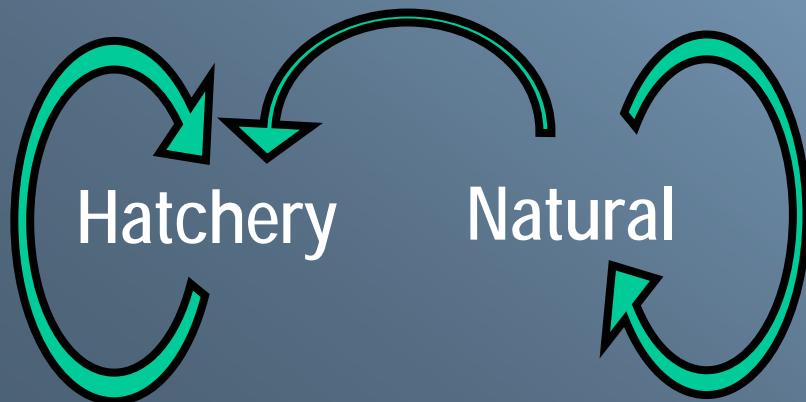


Integrated/Segregated Hatchery Programs



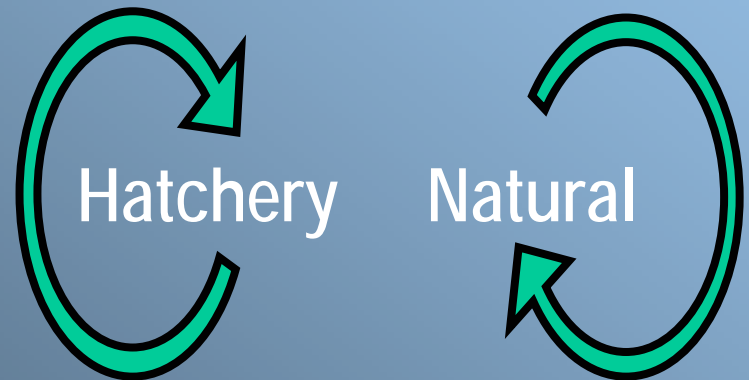
Integrated

One population



Segregated

Two populations

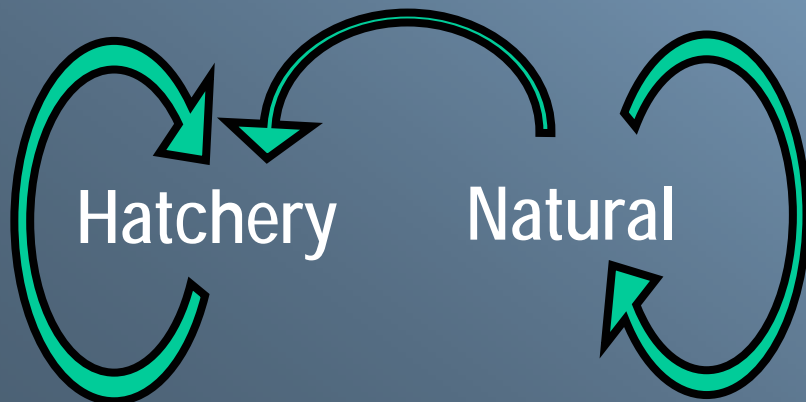


Integrated Hatchery Broodstocks



Integrated

One population



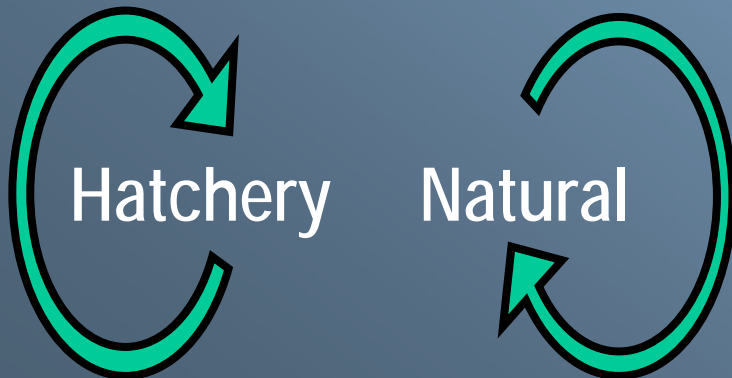
- Intended to artificially increase the demographic abundance of a natural population.
- Requires a self-sustaining natural population to provide broodstock.
- Appropriate for programs with conservation goals and where risks of natural spawning by hatchery fish need to be minimized.
- Natural selection in wild drives mean fitness of hatchery origin fish.

Segregated Hatchery Broodstocks



Segregated

Two populations



- Creates hatchery-adapted population distinct from natural population.
- Hatchery fish may pose genetic and ecological risks to natural populations.
- Appropriate where:
 - 1) Low probability of hatchery fish spawning naturally;
 - 2) Spawning habitat no longer exists (e.g., mitigation for a dam);
 - 3) Smolt release/adult recollection facilities are physically separated from natural spawning areas

Fitness Optima in Two Environments

Hatchery
optimum

Natural
optimum

Hatchery
environment

Fitness

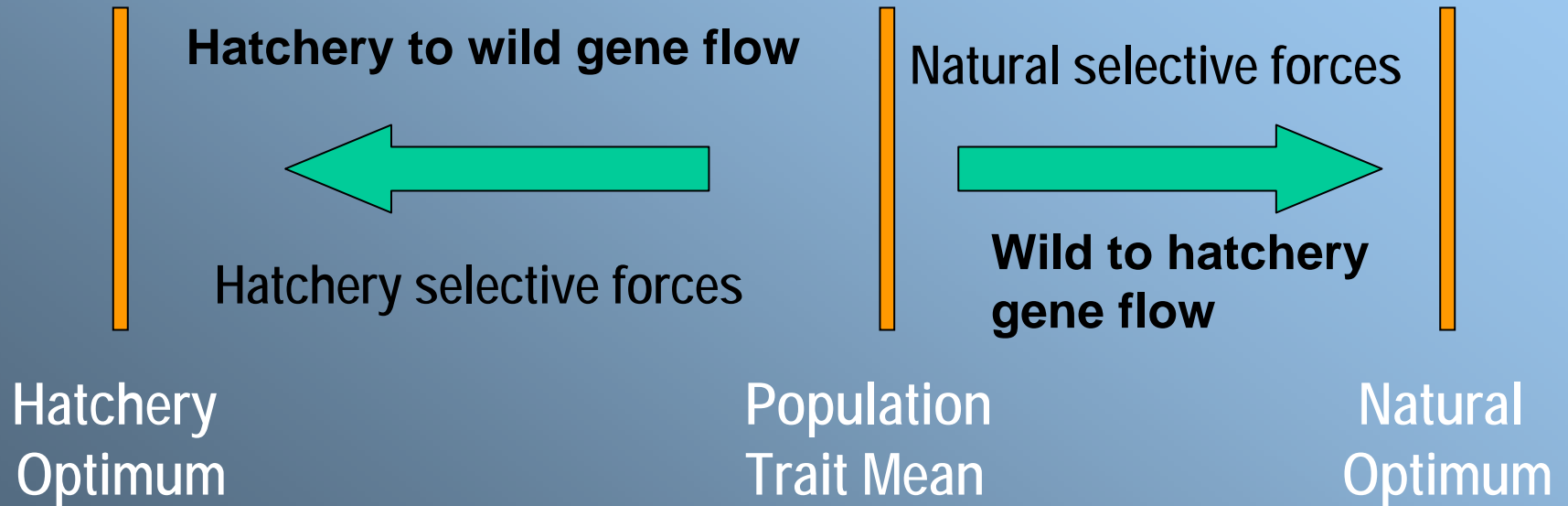
Natural
environment

Trait phenotypic values (e.g. run timing) →

Theory Behind Integrated/Segregated Guidelines

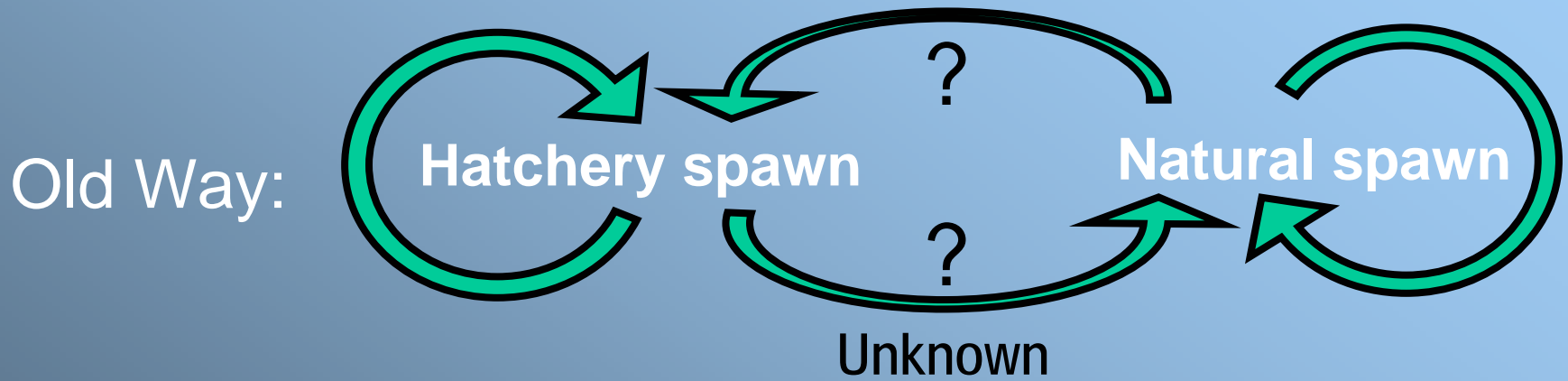
(from Ford 2002)

Natural selection pulls a population in two directions

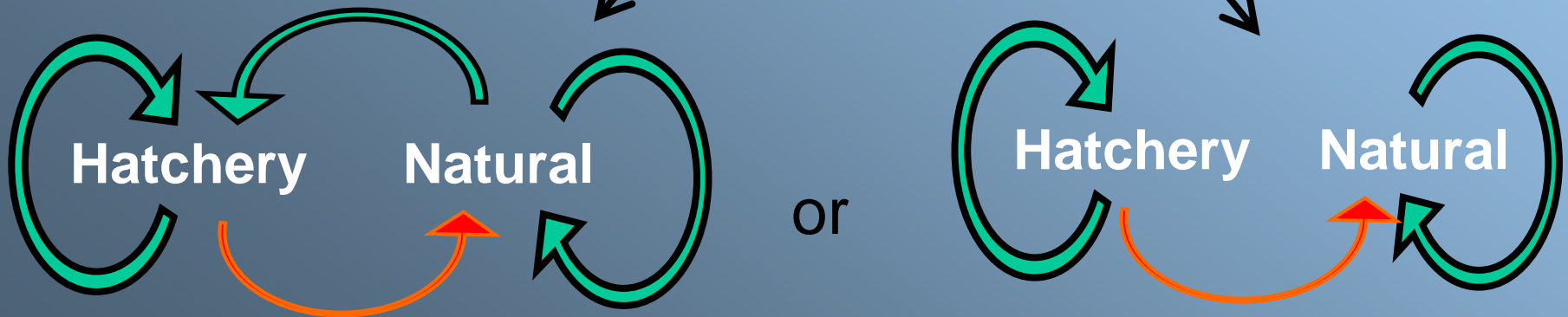


Equilibrium point is determined by balance between hatchery-to-wild and wild-to-hatchery gene flow rates

Broodstock genetic management



[Hatchery reform: Step 1]





HATCHERY REFORM

Progress Report to Congress

April 2005

- Watershed Scale
- Goal Setting
- Monitoring & Evaluation/
Adaptive Management
- Funding
- Integration/Segregation
- Sizing Hatchery Programs
- Steelhead Management





www.hatcheryreform.org