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May 31, 2012

MEMORANDUM

TO: Chair Dukes and members of the Council

FROM: Tony Grover, Fish and Wildlife Division Director
Jeff Allen, Idaho Council Staff

SUBJECT: IDFG hatchery /supplementation polices and activities

Paul Kline, Assistant Chief of Fisheries for the Idaho Department of Fish and Game, will brief the Committee on "Idaho's policy guidance, implementation and evaluation of the use of hatcheries and hatchery-produced anadromous fish to address mitigation and management objectives". Topics Paul will cover include:

- Review of Idaho's native fish and hatchery supplementation policy guidance
- Historical significance of Snake River salmon and steelhead populations
- History of hatchery development in Idaho
- Review of hatchery production objectives and associated terminology (harvest mitigation, conservation, supplementation, etc.)
- Overview of Idaho salmon and steelhead hatchery programs (locations, species, purpose)
- Hatchery reform and IDFG programs
- Review of selected program objectives, timelines, and results (ISS – the Idaho Supplementation Study, other supplementation programs, Redfish Lake sockeye)
- Future State direction and objectives

IDFG Policy guidance, program implementation, and evaluations for hatchery-produced salmon and steelhead

Paul Kline

Idaho Department of Fish and Game

Boise, ID

June 12, 2012

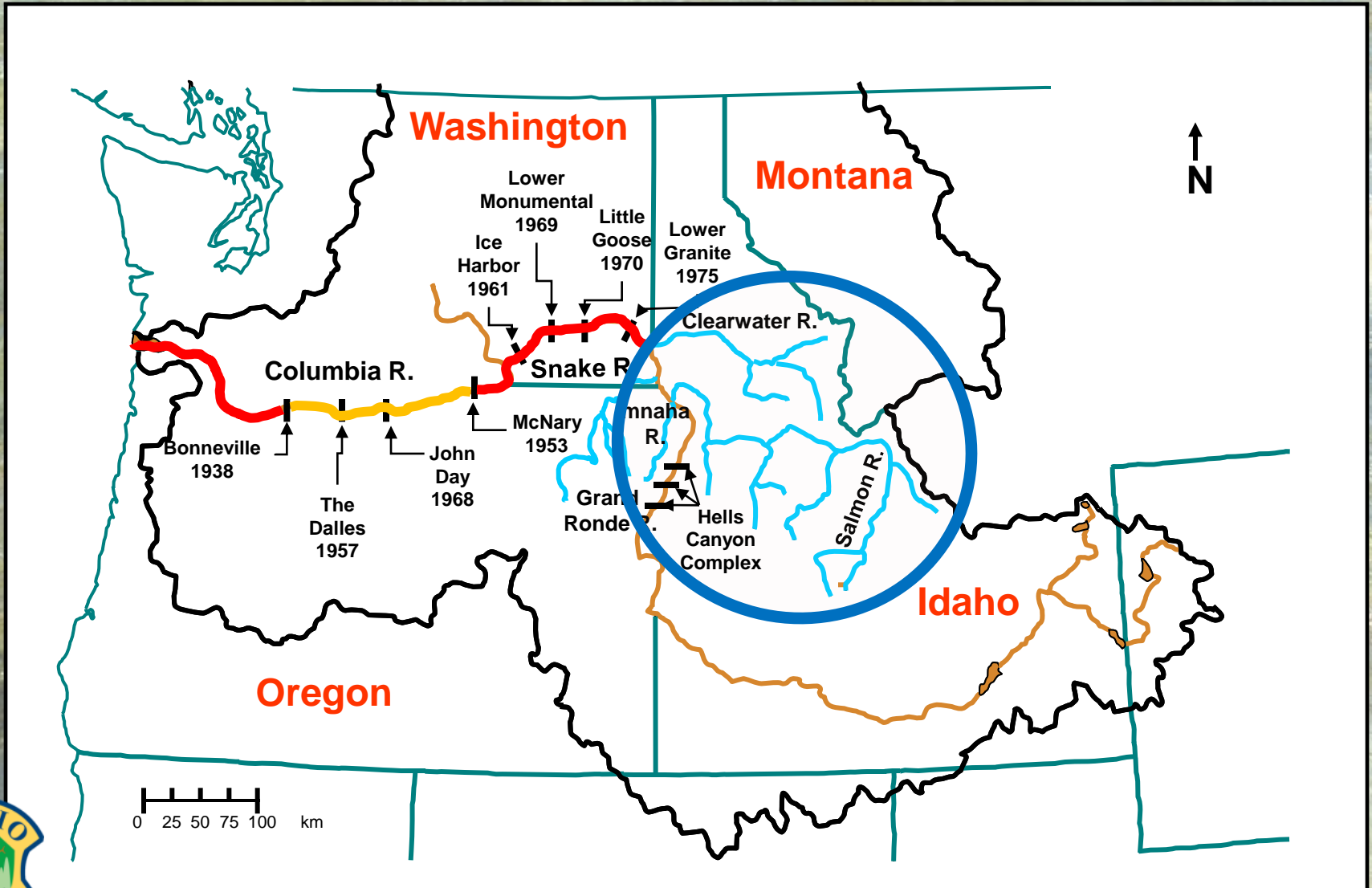


Presentation outline

- Geographic orientation
- Significance of Snake River salmon and steelhead
- Department policy on natural- and hatchery-origin salmon and steelhead
- IDFG anadromous hatchery programs, objectives and associated terminology
- Selected programs and accomplishments



Geographic orientation



Geographic orientation

Lewiston



Salmon

Mountain Snake Province,
Clearwater and Salmon
Subbasins



Historical significance

- Historically, the Snake River produced:
 - 55% of the summer steelhead
 - 40% of the spring Chinook salmon
 - 45% of the summer Chinook salmon in the Columbia River
- Coho and sockeye were also present
 - coho extinct in the mid 1980s
 - sockeye almost extinct in the 1990s



Historical significance

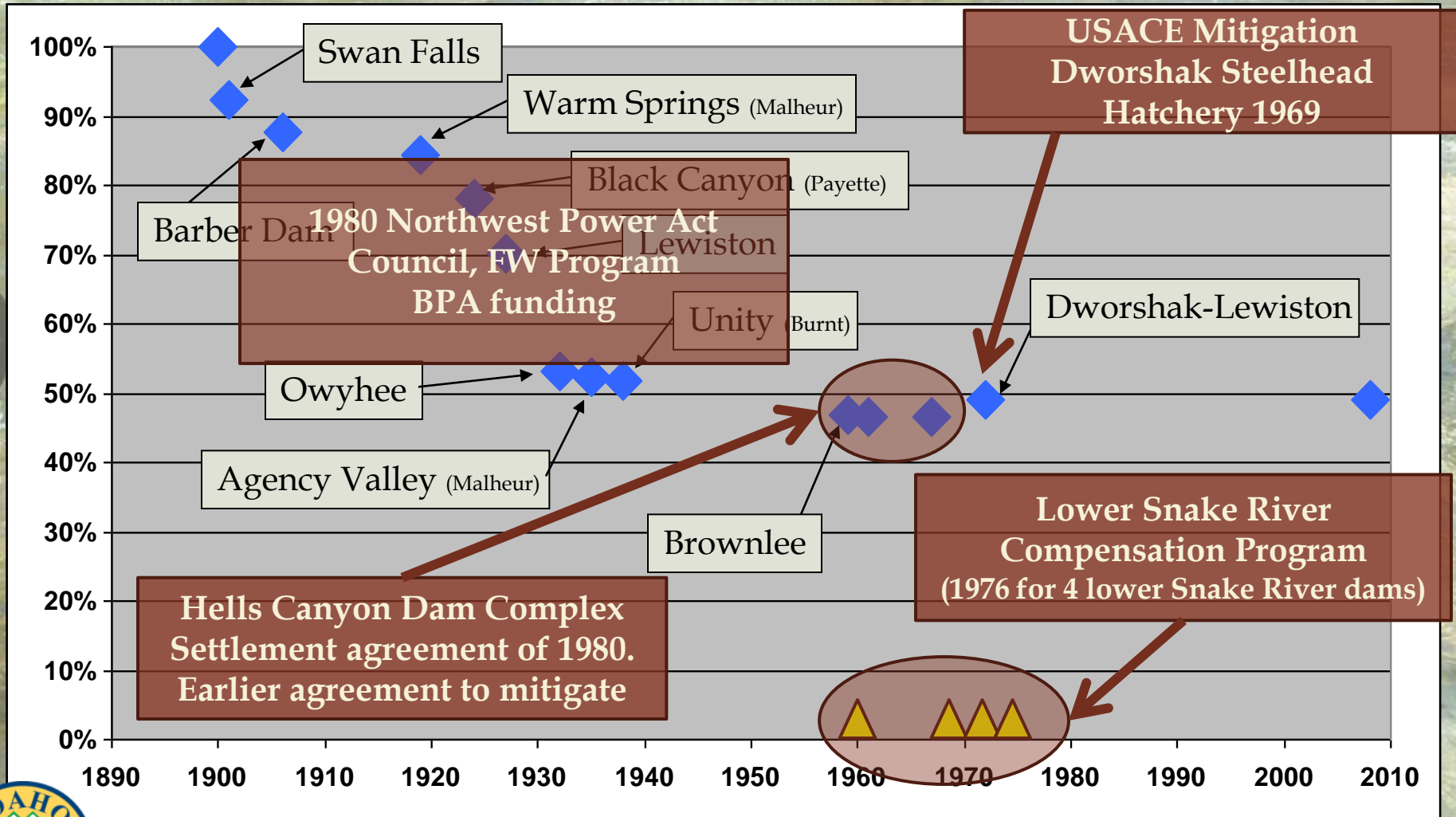


Historically, salmon and steelhead inhabited streams in SE Oregon, southern Idaho and Nevada

Approximately 50% of Snake River salmon and steelhead habitat has been lost as a result of dam construction where fish passage was not provided



Historical significance



Development of hatchery programs

- Hatcheries came online to mitigate for hydroelectric dam const. and operation:
 - Private: 4 IPC hatcheries (1962 - 1967)
 - National: Dworshak, Kooskia, Hagerman NFHs (1966, 1985)
 - USFWS: 4 State-operated LSRCF hatcheries (1979 - 1992)
 - BPA: Nez Perce Tribal Hatchery 2002, Eagle Hatchery modifications (2008) and Springfield (IDFG) and Crystal Springs (SBT) in the next few years

Hatchery fish management policy

- Hatcheries built as partial mitigation for hydroelectric development
- Hatcheries function primarily to produce fish for harvest
- Artificial production limited or absent in wild production areas. Releases managed to minimize impacts on native fish

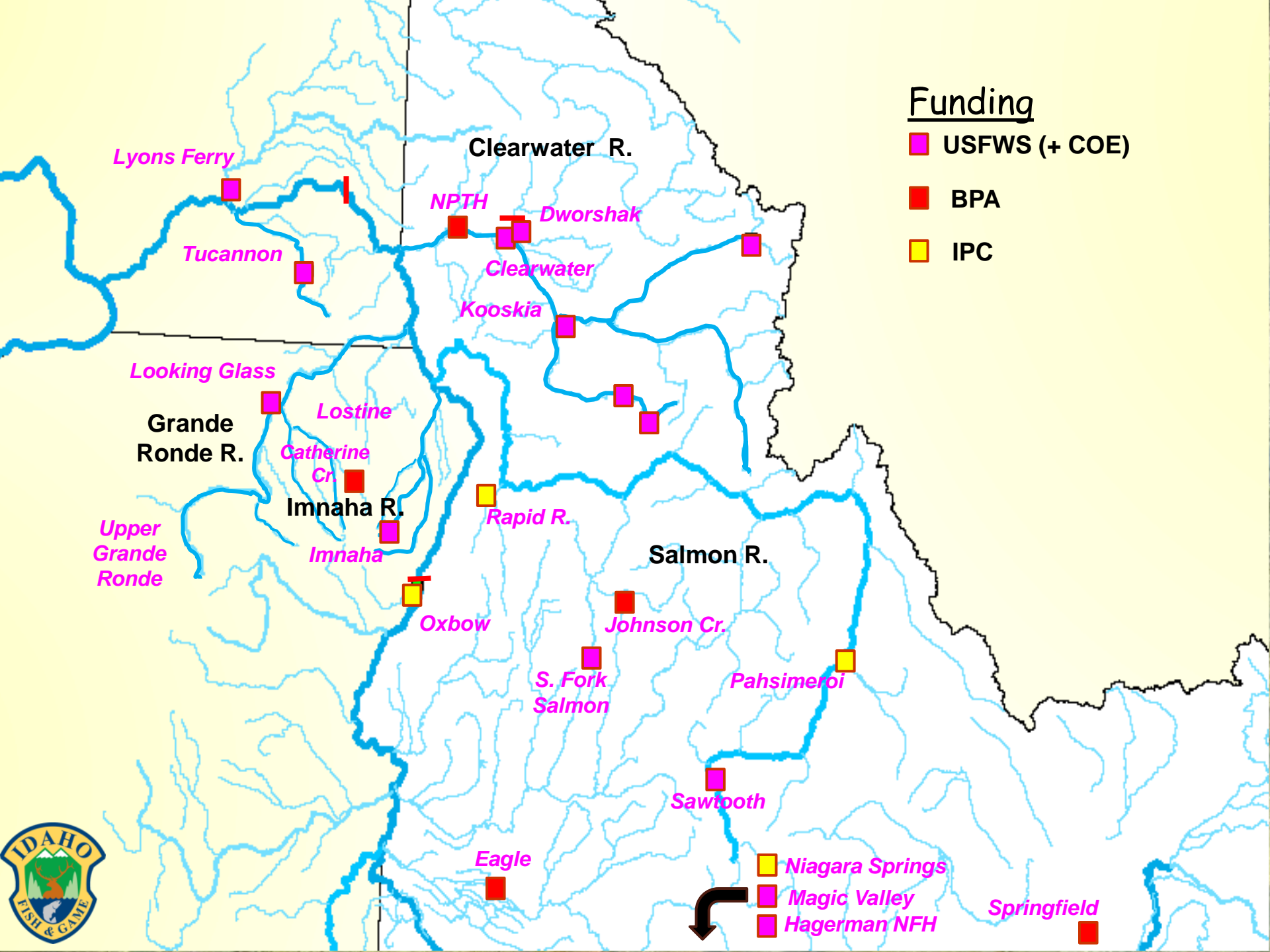


Hatchery fish management policy

Department's mission:

To preserve, protect, perpetuate and manage Idaho's wildlife resources to provide for citizens... and to provide continued supplies for hunting, fishing and trapping





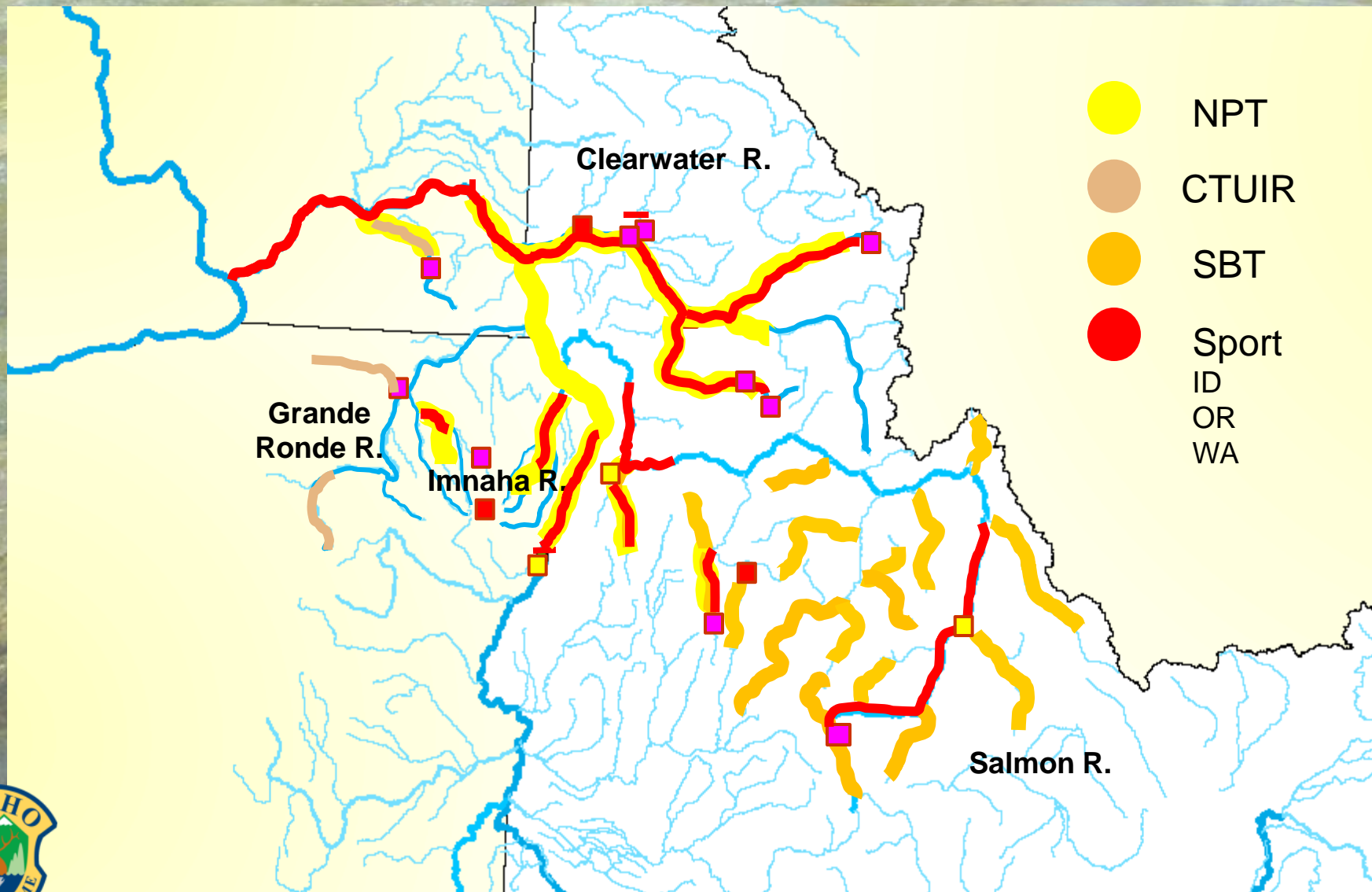
Funding

- USFWS (+ COE)
- BPA
- IPC

- Niagara Springs
- Magic Valley
- Hagerman NFH



Tribal and sport fisheries - Snake, Clearwater & Salmon Rivers



Idaho's spring/summer Chinook hatchery programs

Salmon River Spring/Summer Chinook Releases			
Hatchery	Operator	Eyed-eggs	smolts
McCall	IDFG	600,000	1,100,000
Pahsimeroi	IDFG		1,000,000
Rapid River	IDFG		3,000,000
Sawtooth	IDFG		1,700,000
Totals		600,000	6,800,000

Clearwater River Spring/Summer Chinook Releases				
Hatchery	Operator	Eyed-eggs	Sub-yearlings	smolts
Dworshak NFH	USFWS/NPT			1,050,000
Kooskia NFH	NPT		50,000	600,000
NPTH	NPT		625,000	200,000
Clearwater	IDFG		300,000	2,535,000
Totals			975,000	4,385,000

Total sp/su Chinook eggs and juveniles released: 12,760,000



Idaho's fall Chinook and coho hatchery programs

Clearwater/Snake River Fall Chinook Releases				
Hatchery	Operator	Eyed-eggs	Sub-yearlings	smolts
Lyons Ferry	WDFW/NPT		1,400,000	450,000
NPTH	NPT		1,400,000	
Dworshak NFH	USFWS/NPT		328,000	
Oxbow	IPC/IDFG		1,000,000	
Totals			4,128,000	450,000

Clearwater River Coho Releases				
Hatchery	Operator	Eyed-eggs	Sub-yearlings	smolts
Eagle Creek NFH	USFWS/NPT			550,000
Dworshak NFH	NPT			280,000
Potlatch	NPT		30,000	
Totals			30,000	830,000



Idaho's steelhead hatchery programs

Salmon River Steelhead Releases			
Hatchery	Operator	Eyed-eggs	smolts
Hagerman NFH	USFWS		1,360,000
Magic Valley	IDFG		1,540,000
Niagara Springs	IDFG		1,800,000
Pahsimeroi	IDFG	500,000	
Sawtooth	IDFG	500,000	
Totals		1,000,000	4,700,000

Clearwater River Steelhead Releases			
Hatchery	Operator	Eyed-eggs	smolts
Dworshak NFH	USFWS/NPT		2,100,000
Clearwater	IDFG		843000
Totals			2,943,000

Total steelhead eggs and smolts released: 8,643,000



Idaho's Hatchery Programs

- Putting release numbers in perspective for sp/su Chinook and summer steelhead:
 - Snake River hatcheries produce 34% of all sp/su Chinook produced in Columbia River drainage (31% in Idaho)
 - Snake River hatcheries produce 61% of all summer steelhead produced in Columbia River drainage (52% in Idaho)

Harvest management history - Chinook

Almost all waters that salmon could access were open to fishing.

Start to see transition to more hatchery fish in the harvest in 1970s.

Many river sections were being closed to fishing.

1950s and prior, season open all year. Harvest is entirely wild origin.

No Chinook seasons, 1979-1984.

South Fork Salmon River closed beginning 1966. Rapid River Hatchery begins contributing to harvest in 1967.

Limited seasons for RR fish 1985-1993

No Chinook seasons, 1994-1996

Open seasons since 1997



Harvest management history - Steelhead

All waters that steelhead could access were open to fishing.

Last record of harvest in the Lochsa, Selway, South Fork Salmon River and Middle Fork Salmon River drainages was in 1973.

Oxbow Hatchery begins contributing to harvest in 1966.

Seasons and locations restricted 1976-1989

No harvest in 1975

Consistent seasons 1990s and 2000s. Harvest very good in some years

1940s

1950s

1960s

1970s

1980s

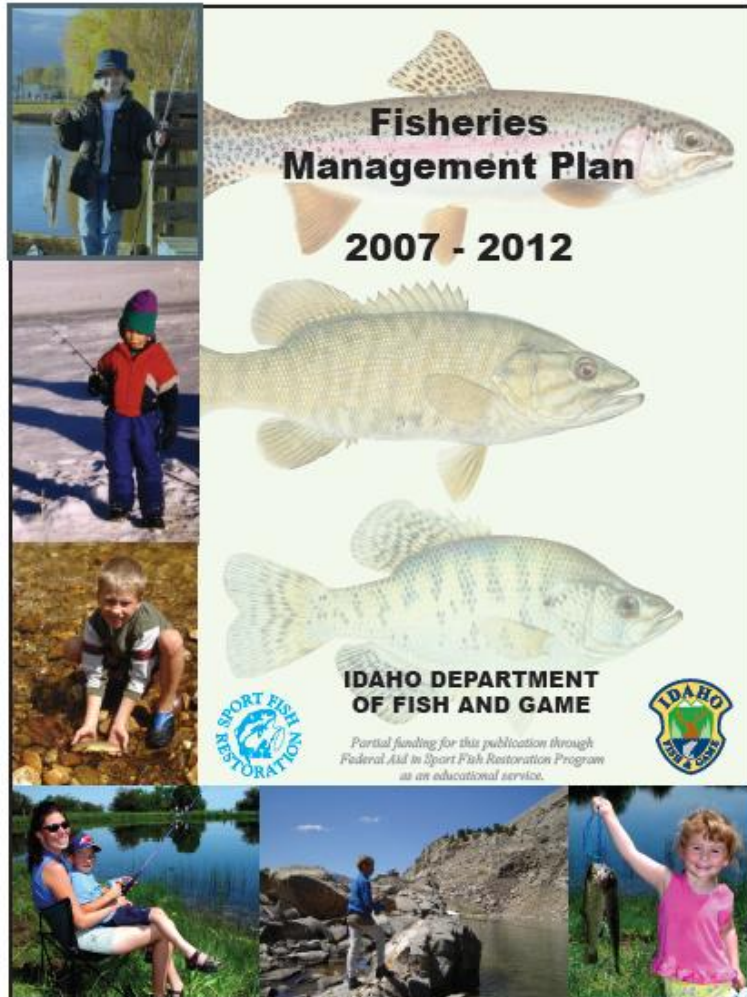
1990s

2000s

2010s



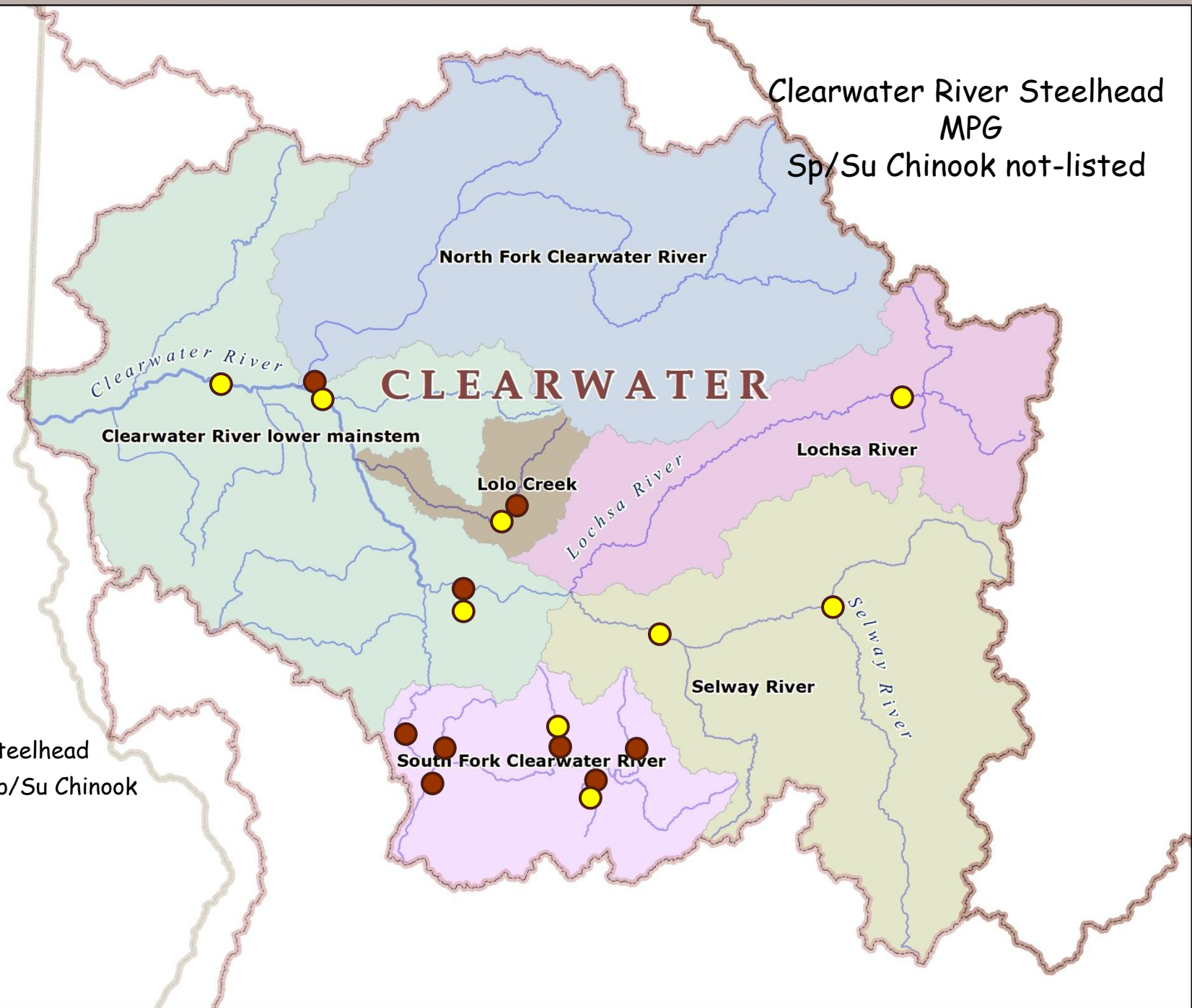
Native fish conservation policy



- Commission-approved
- "The Department will emphasize maintaining remaining populations of wild, native stocks of salmon and steelhead where they occur in sustainable habitat"
- Maintain genetic integrity and diversity....



Clearwater River Steelhead
MPG
Sp/Su Chinook not-listed



- Steelhead
- Sp/Su Chinook



Salmon River Steelhead MPG



Salmon River Sp/Su Chinook MPGs

SF Salmon, MF Salmon, Up. Salmon



● Sp/Su Chinook



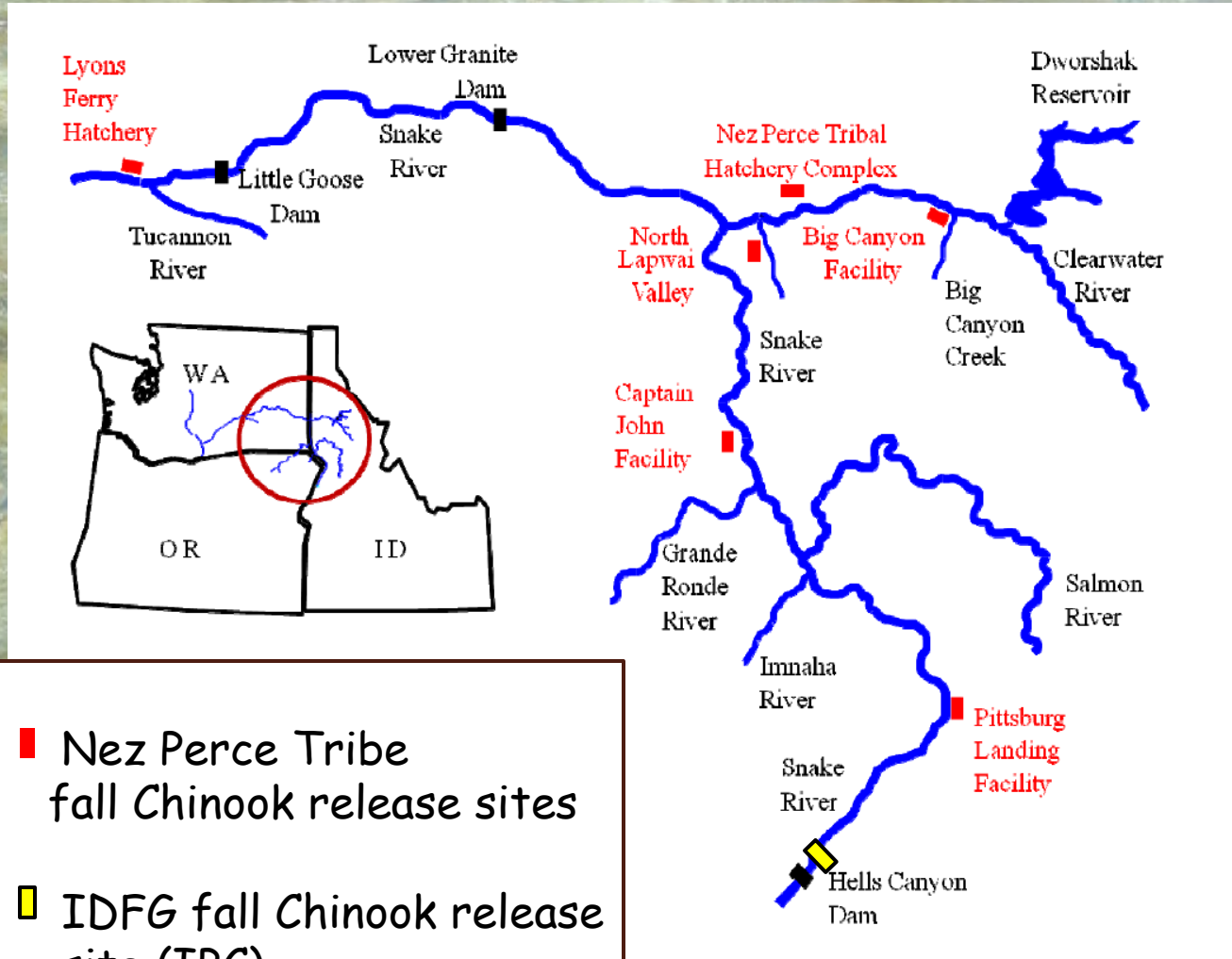
Snake River fall Chinook ESU



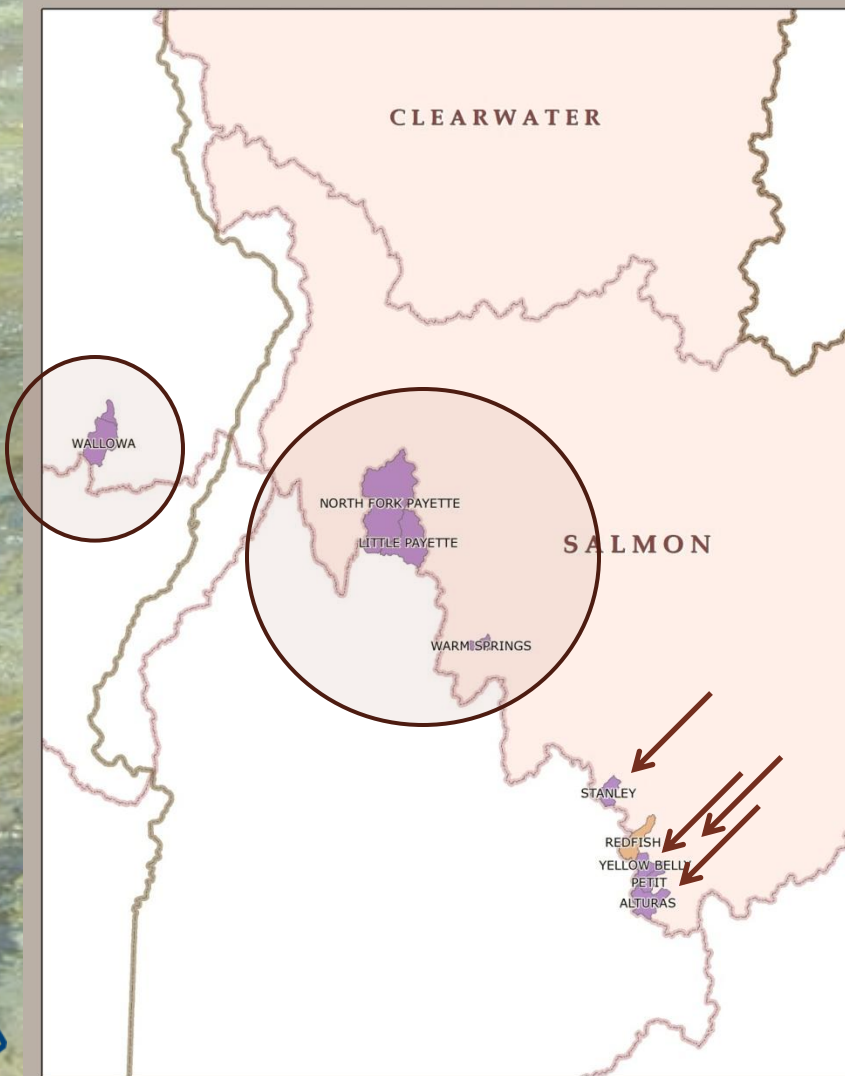
- Snake River fall Chinook ESU
- Blocked upstream of Hells Canyon complex
- Nez Perce began releasing fall Chinook in 2003
- IPC settlement agreement program



Fall Chinook release locations



Snake River sockeye ESU



- Snake River sockeye ESU
- Wallowa, Payette, and Warm Springs populations extirpated
- Stanley, Yellowbelly, Alturas, and Pettit populations extirpated



Idaho's Hatchery Programs

Harvest augmentation refers to the stocking of anadromous fish where the primary purpose is to return adults for sport, tribal, and commercial harvest



Idaho's Hatchery Programs

- Beginning in the 1980s hatcheries began to be used to address additional objectives:
 - The enhancement of natural production through supplementation and
 - The conservation of important stocks at risk using captive broodstocking



Idaho's Hatchery Programs

- Development of new programs influenced by:
 - Agency policy/ management (stated conservation objectives)
 - Current mitigation program language
 - ESA (broodstock management)
 - US v Oregon Production Agreement
 - Hatchery reform (recommendations)



Idaho's Hatchery Programs

Supplementation is the use of artificial propagation in an attempt to maintain or increase natural production, while maintaining the long-term fitness of the target population and keeping the ecological and genetic impacts on non-target populations within specified biological limits (RASP 1992).



Idaho's Hatchery Programs

Conservation hatcheries focus on maintaining genetic resources, using the amplification potential of the hatchery, and restoring natural populations that face demographic, genetic, or ecological risks. The expectation is to maintain equivalent genetic resources of the native stock, and to return fish to the habitat to reproduce naturally. Time in culture should be minimized



Idaho's Hatchery Programs

Integrated Goal:

*1 population,
2 environments*



Integrated

Segregated Goal:

*2 populations,
2 environments*

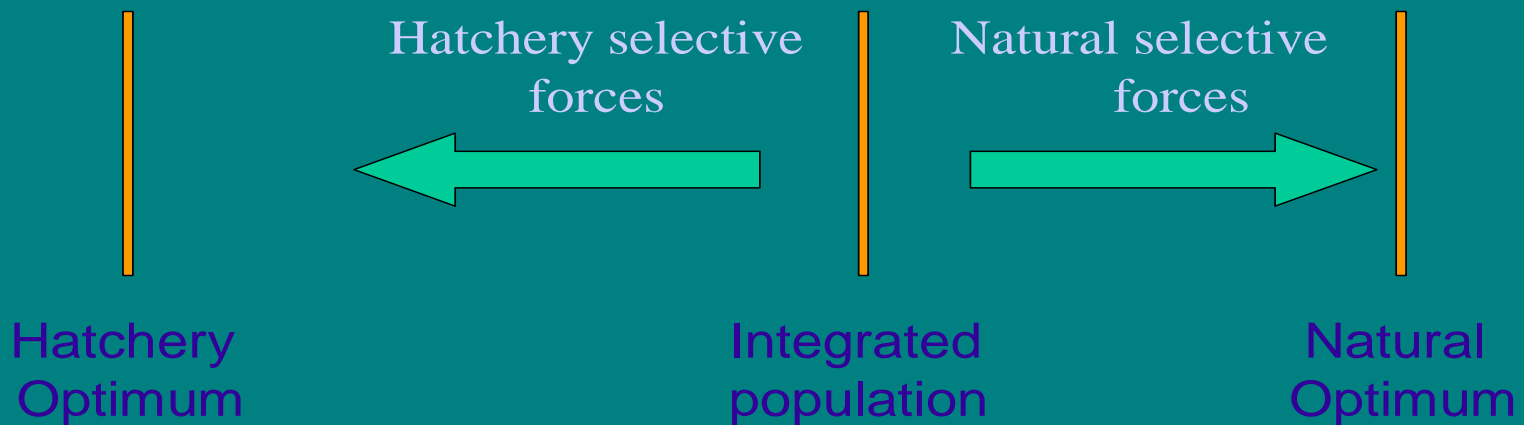


Segregated

Idaho's Hatchery Programs

Theory Behind Guidelines for Integrated Programs (from model of Ford 2002)

Natural selection pulls an integrated population in two directions.



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



Idaho's Hatchery Programs

- | | |
|------|--------------------------------|
| 1990 | RASP process |
| 1994 | IHOT process |
| 1998 | APR process |
| 2000 | Return to the River (ISG) |
| 2003 | ISAB review of supplementation |
| 2003 | ISRP review of Idaho ISS |
| 2003 | APRE report |
| 2005 | ISRP/ISAB review of sup. RME |
| 2008 | ADHOC Supplementation Work |
| 2009 | HSRG/HRT |

Hatchery
Reform



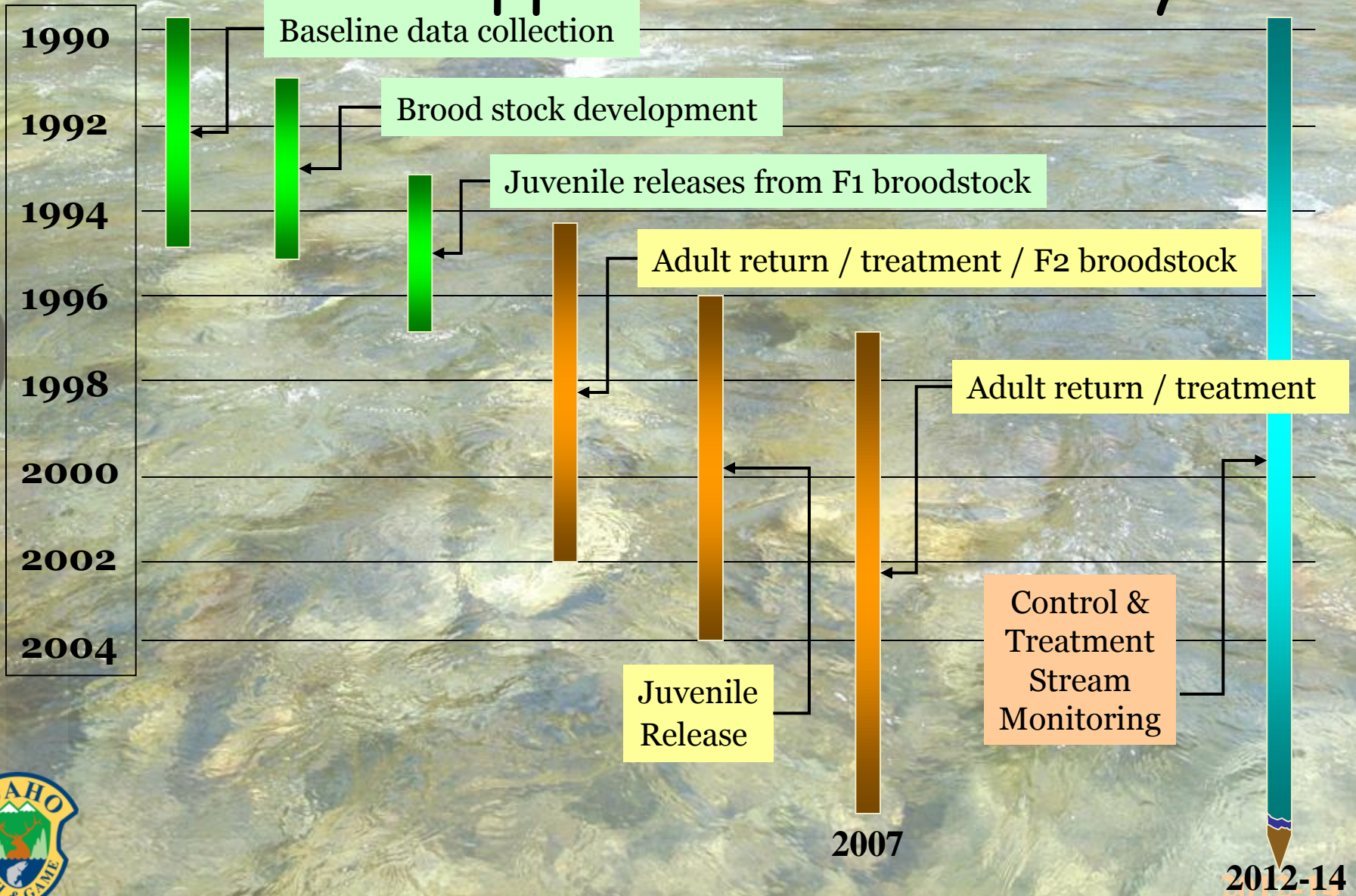
Review of selected integrated
supplementation and conservation
programs



Idaho Supplementation Study Project 198909800



Idaho Supplementation Study



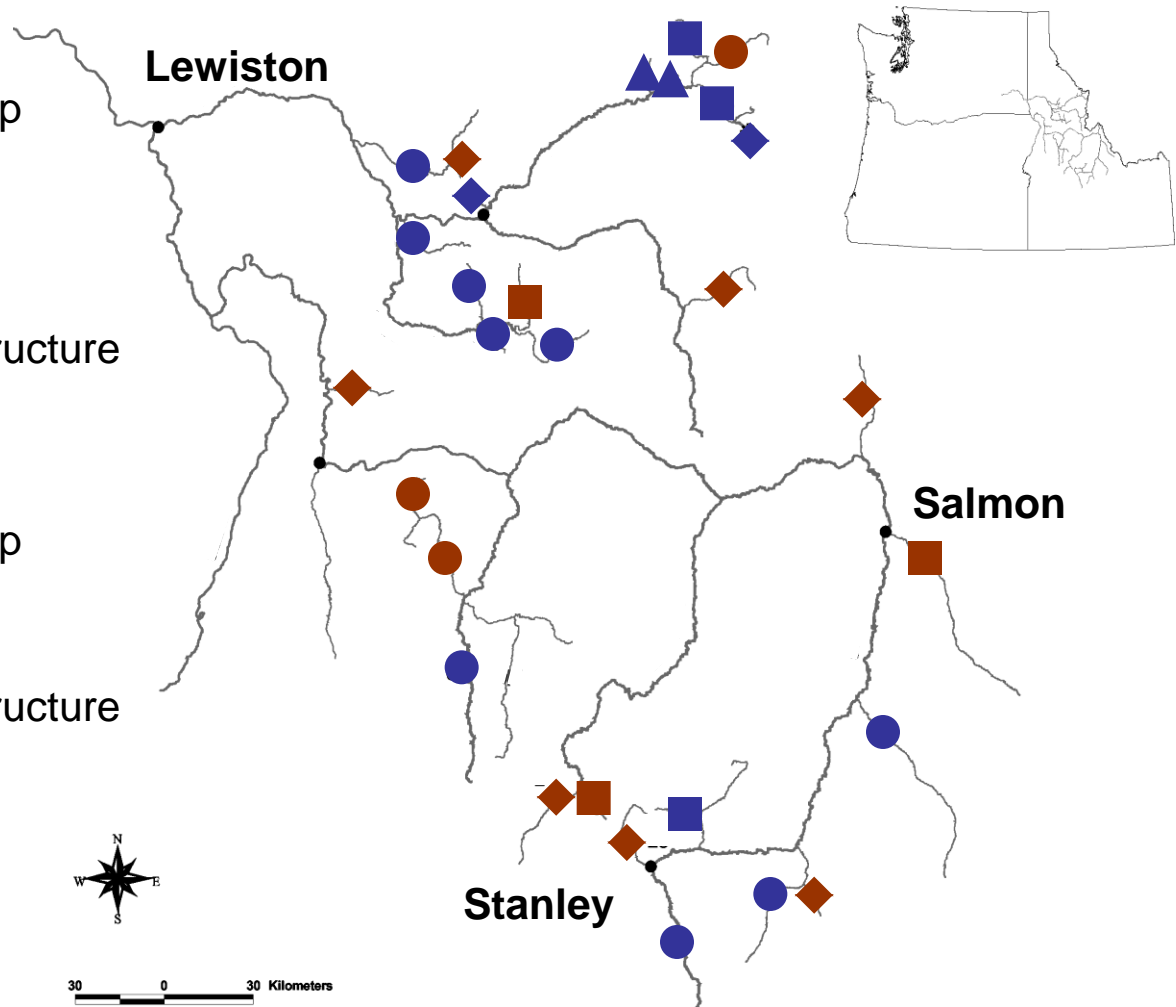
Idaho Supplementation Study

Treatment

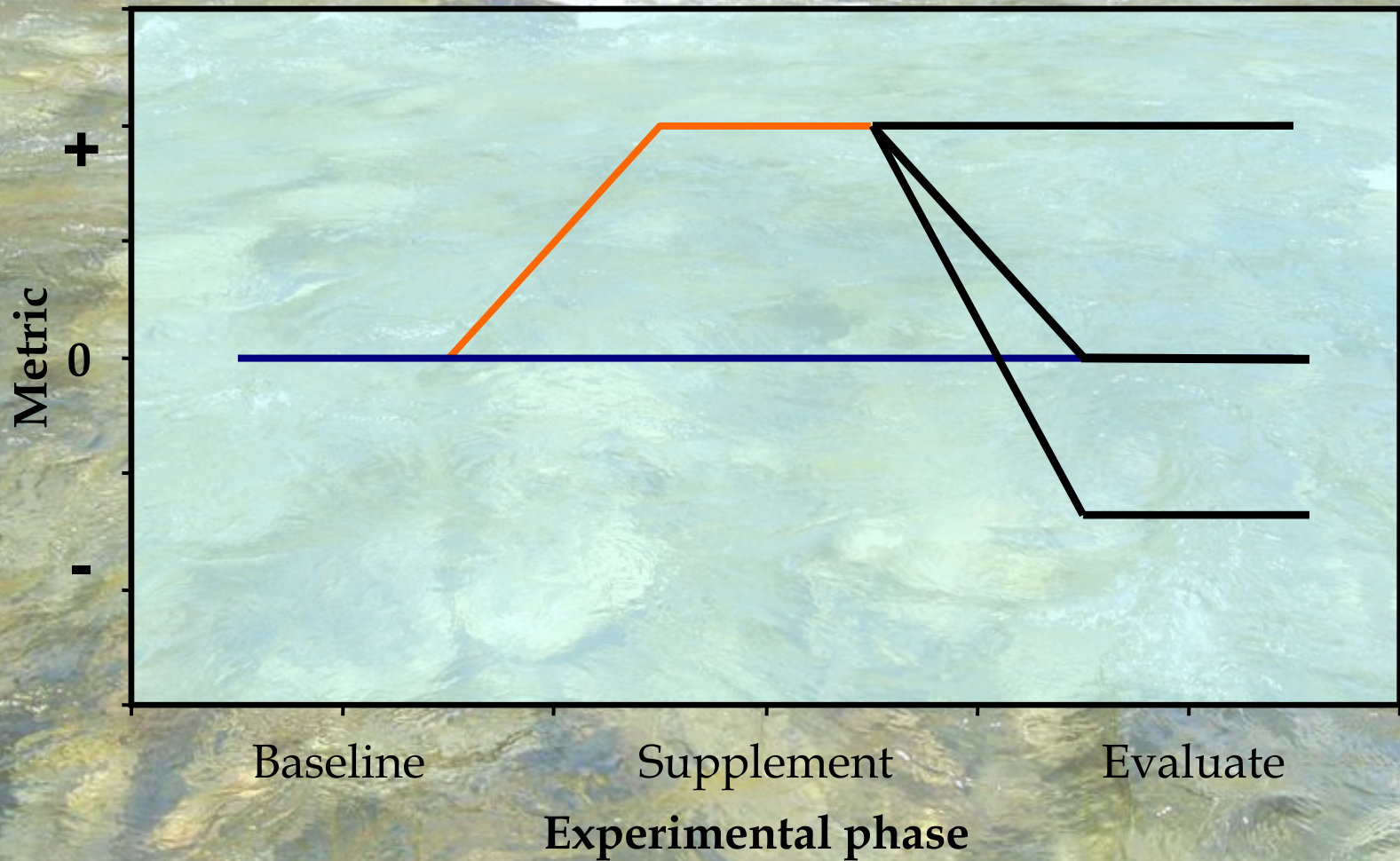
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- ▲ Weir
- ◆ No infrastructure

Reference

- Weir & Trap
- Trap
- ◆ No infrastructure



Idaho Supplementation Study



Idaho Supplementation Study (ISS)

- Data analysis and final reporting 2014-2015
- Preliminary results from one stream (Pahsimeroi) indicate:
 - supplementation (hatchery) and natural adults randomly mating in the wild
 - the contribution of parents and relative reproductive success of supplementation and natural adults to first generation smolts equal



Chinook captive rearing Project 200740300



Chinook captive rearing

- Initiated in 1995 when record low numbers of sp/su Chinook returned to the Snake River
- Using conservation aquaculture techniques to rear Chinook full-term to maturation in the hatchery
- Determining contribution of captive-reared adults to subsequent generations
- Will identify advantages/disadvantages of this approach and contrast with concurrently run captive broodstock program in E. Oregon.
- This program will sunset in 2015



Sockeye captive broodstock Project 200740200



Sockeye captive broodstock

- Initiated in 1991 after a prolonged period of low returns of sockeye to the Snake River
- Using conservation aquaculture techniques to rear sockeye full-term to maturation in the hatchery
- Maintained population genetic diversity and likely prevented extinction
- Expanding program into “re-colonization” phase using smolt releases to increase anad. returns.



Other examples

- New integrated broodstock programs for three sp/su Chinook populations and one steelhead pop.
 - Upper Salmon, Pahsimeroi, SF Salmon Chinook
 - EF Salmon Steelhead
- New efforts to establish localized broodstocks of steelhead in Clearwater and Salmon River basins
 - SF Clearwater steelhead
 - Salmon River B-run steelhead
- Programs address IDFG conservation priorities and HSRG/HRT recommendations



Next steps?



Next steps

HGMP

HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Wenatchee River Summer Steelhead
Species or Hatchery Stock:	Upper Columbia River Summer Steelhead (<i>Oncorhynchus mykiss</i>)
Agency/Operator:	Chelan County Public Utility District No. 1 (Chelan PUD) Washington Department of Fish and Wildlife (WDFW)
Watershed and Region:	Wenatchee Sub-basin/Columbia Cascade Province
Date Submitted:	October 14 , 2009
Date Last Updated:	August 21, 2009

- HGMPs should continue to be used to identify program goals, objectives, approaches to implementation, and M&E plans
- To continue to form the foundation of biological information used by NOAA for ESA decision making and permitting



Next steps

HSRG



Report to Congress on Columbia River Basin Hatchery Reform

Hatchery Scientific Review Group
February 2009



Rapid River Hatchery

- The region's dedication to implementing hatchery reform recommendations has been exemplary
- Best management practices are being implemented consistently across the region and hatchery goals and objectives are being defined and effectively pursued



Next steps

AHSWG

Recommendations for Broad Scale Monitoring to Evaluate the Effects of Hatchery Supplementation on the Fitness of Natural Salmon and Steelhead Populations

Final Report of the Ad Hoc Supplementation Monitoring and Evaluation Workgroup*

Peter F. Galbreath¹, Chris A. Beasley²,
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² Quantitative Consultants, Inc.

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⁴ Oregon Department of Fish and Wildlife

⁵ Yakama Nation, Yakima Klickitat Fisheries Project

⁶ Nez Perce Tribe, Department of Fisheries Resources Management

⁷ Western EcoSystems Technology, Inc.

⁸ Washington Department of Fish and Wildlife

⁹ Peven Consulting, Inc.

¹⁰ Idaho Department of Fish and Game

October 9, 2008

* Workgroup members participated as individuals, not as agency representatives. The report's content, conclusions and recommendations are solely those of the workgroup.

- Developed a strategy to integrate individual hatchery evaluation programs into a regional framework
- With standardized protocols for M&E, continued/expanded VSP monitoring, and continued/expanded RRS studies



Next steps

Snake River Recovery Plan

Cha

011

Chapters 1-3

**Draft Recovery Plan for Idaho Snake River
Spring/Summer Chinook and Steelhead Populations
in the
Snake River Spring/Summer Chinook Salmon Evolutionarily Significant Unit
and
Snake River Steelhead Distinct Population Segment**

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- The Region is still finalizing goals for SR salmon and steelhead.
- Development of implementation strategies that may require program modifications



- Idaho will continue to emphasize the importance of fisheries and the production of fish for harvest
- Ensure that wild fish populations are managed effectively and that remaining habitat is protected or improved
- Continue implementation supplementation and conservation aquaculture programs that address agency priorities
- Stress the importance of defining goals and objectives for hatchery programs and ensuring appropriate monitoring and evaluation programs as well as adaptive management frameworks are in place to effectively manage outcomes



- Continue to implement elements of hatchery reform described in HSRG, HRT, and other documents
- Participate in regional discussions to develop guidance for supplementation actions, monitoring, and evaluation (e.g., CRHEET)
- Support the development of tools such as genetic stock identification (GSI) and parentage-based tagging (PBT) to refine our ability to identify hatchery-origin and natural-origin salmon and steelhead - and as tools for evaluating supplementation and RRS studies