Steelhead Streamside Incubation Program

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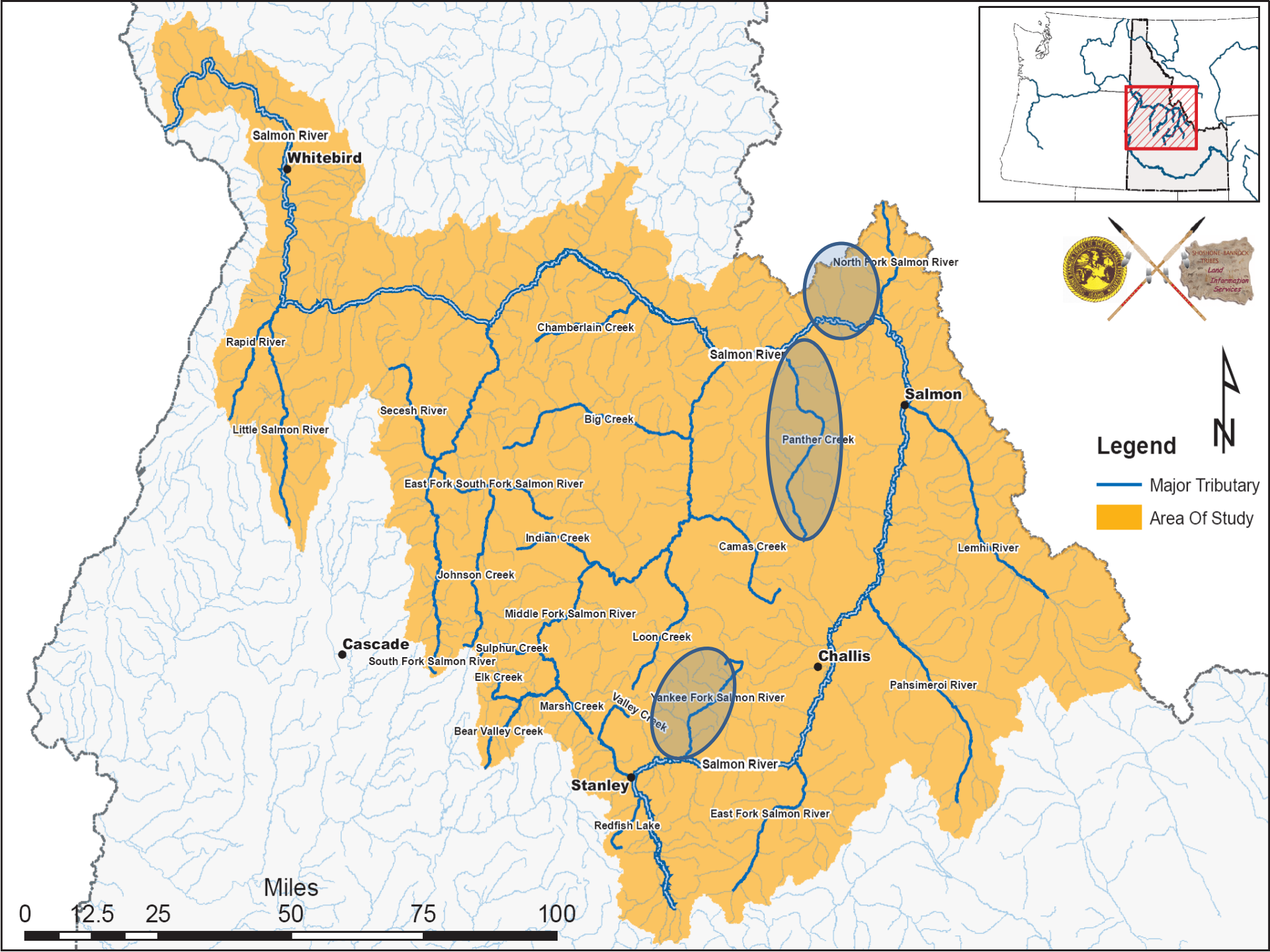
Shoshone-Bannock Tribes

Steelhead Program Review

June 21, 2012

Acknowledgments

- Program Staff
- Lower Snake River Compensation Plan – Office
- Idaho Department of Fish and Game
- Forest Service – Salmon-Challis Nat’l Forest
- And a guy on a buffalo!!!


Salmon River
Whitebird
Rapid River
Little Salmon River
Secesh River
Chamberlain Creek
Big Creek
East Fork South Fork Salmon River
Indian Creek
Johnson Creek
Middle Fork Salmon River
Cascade
South Fork Salmon River
Sulphur Creek
Elk Creek
Marsh Creek
Bear Valley Creek
Valley Creek
Loon Creek
Yankee Fork Salmon River
Stanley
Salmon River
Redfish Lake
East Fork Salmon River
North Fork Salmon River
Salmon River
Panther Creek
Salmon
Camas Creek
Lemhi River
Challis
Pahsimeroi River
Legend
Major Tributary
Area Of Study
N
Miles
0 12.5 25 50 75 100

Program Overview

- Background
- Vision, Goals, and Objectives
- Features
- Accomplishments
- Future Work

Background

- How the Steelhead Streamside Incubator Program got started
  - Pre – 1970
    - Ample harvest opportunities for Chinook salmon and steelhead
  - 1972
    - State vs. Tinno; Shoshone-Bannock Tribes Fort Bridger Treaty Rights are challenged over a fishing incident in the Yankee Fork Salmon River
  - 1970's – 90's
    - Harvest opportunities become more and more limited
    - An occasional "bathtub fishery" stimulates harvest
  - 1975
    - Tribal Game Code established
      - Regulates harvest of salmon and steelhead
      - Fisheries begin to be constrained
  - 1977 – 1991
    - Policy supported native fish population management
    - Certain areas were designated for harvest (e.g., Yankee Fork) and other areas curtailed (e.g., Bear Valley Creek)
    - Designated harvest areas did not have fish and interest in fishing waned
  - 1991 – 1994
    - South Fork Salmon River provides fishery benefits on hatchery Chinook salmon
    - Hatchery fish save cultural, traditional ,and subsistence-based linkages to anadromous fish
    - Hatchery fish rejuvenate interest in fishing
    - Policy decision makers shift to supporting artificial production as a tool to provide harvest
    - Least intrusive artificial propagation techniques pursued
      - Tribes propose Chinook eggbox programs
        - » Lack of support and broodstock
      - Tribes propose using eggboxes with steelhead
  - 1995 – Steelhead Streamside Incubation Program initiated

Vision

- *“The Tribes will pursue, promote, and where necessary, initiate efforts to restore the Snake River systems and affected unoccupied lands to a natural condition. This includes the restoration of component resources to conditions which most closely represents the ecological features associated with a natural riverine ecosystem. In addition, the Tribes will work to ensure the protection, preservation, and where appropriate-the enhancement of Rights reserved by the Tribes under the Fort Bridger Treaty of 1868 and any inherent aboriginal rights.”*

Goals

- Increase harvest opportunities for Tribal members
- Provide connection with and protection of cultural and social values and rights
- Develop an experimental project for assessing the potential for using artificial production to increase early life survival of steelhead and salmon populations

Management Objectives

- Harvest objectives
  - increase from baseline conditions
  - preserve traditional fishing techniques
- Production objectives
  - increase egg to fry survival
    - test streamside incubation technology
    - determine optimum egg loading density and configurations
  - incubate 1,000,000 eyed eggs annually
    - Yankee Fork – 500,000
    - Panther Creek – 400,000
    - Indian Creek – 100,000
- Additional objectives
  - minimize cost, process, and fish handling
  - increase community education, involvement, and participation
  - fulfill the requirements of *US vs. Oregon*

Program Features

- remote incubation site set-up
- acquisition of eyed-egg from local hatcheries
- transportation of eyed-eggs to remote incubators
- daily incubator operations and maintenance
- dead egg count and volitionally fry release
- remote incubation site disassemble

Program Accomplishments

- Successfully identified preferred incubation methods (i.e. upwellers)
- Involved the community
  - Dance of the Salmon
  - Private Landowners
- Completed initial M&E using DNA parentage analysis
- Recently secured funding to fully implement the program and conduct M&E

Hatch Success

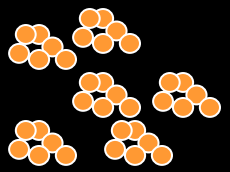
Year	Eggs Planted	Eggs Hatched	% Hatch
1995	201,600	149,570	74.2%
1996	646,000	510,000	78.9%
1997	1,000,000	755,000	75.5%
1998	1,050,210	856,751	81.6%
1999	836,960	632,388	75.6%
2000	874,181	722,948	82.7%
2001	976,297	880,641	90.2%
2002	845,585	815,379	96.4%
2003	1,085,431	1,053,509	97.1%
2004	1,004,939	570,333	56.8%
2005	1,109,730	1,101,941	99.3%
2006	989,608	606,792	61.3%
2007	1,070,051	896,278	83.8%
2008	1,135,510	1,044,319	92.0%
2009	1,010,461	900,217	89.1%
Total	13,836,563	11,496,066	82.3%

Monitoring, Research, & Evaluation

- Conducted parental exclusion/pedigree analysis
  - Broodstock collected and spawned at Sawtooth FH from 2006 – 2008
  - Eggs outplanted into remote incubators in Yankee Fork
  - Juvenile steelhead were sampled in tributary habitats of Yankee Fork from 2006 – 2009
    - randomly select sampling sites throughout watershed
    - conducted electrofishing: 3-pass removal w/ block nets
    - collected tissue samples from age-0+ and age-1+ juvenile steelhead
  - Compared parental genotypes of broodstock fish to unknown origin Yankee Fork juveniles
    - determine relative abundance of SSI progeny and natural origin progeny

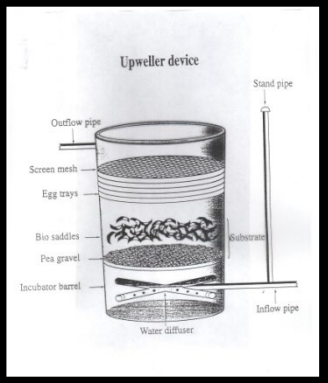
M & E Approach: F_1 generation

1. Spawn Hatchery Adults

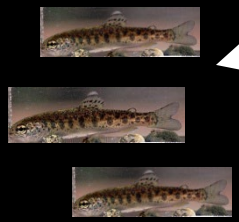


2. Collect and Incubate Eggs

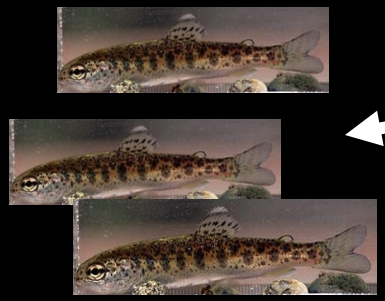
3. Incubate Eyed-eggs in incubators



4. Release fry volitionally



5. Collect 0+ parr during first fall



6. Collect 1+ parr during second fall

	No. of steelhead genotyped				Single year analysis			Comprehensive analysis			
		Electrofishing		Trap	No. of ssignments			No. of assignments			
Year	Brood stock	Age-0$^+$ Juveniles	Age-1$^+$ Smolts	Age-1$^+$ Smolts	Age-0$^+$ Juveniles	Age-1$^+$ Smolts	Overall HAT	Age-0$^+$ Juveniles	Age-1$^+$ Smolts	Age-2$^+$ Smolts	Overall HAT
2006	104	349	123	--	57	5	0.131	57	5	4	0.140
2007	174	459	120	67	72	15	0.135	72	20	12	0.161
2008	213[a]	386[b]	0	228	64	6	0.114	64	6	--	0.114
totals:	491	1194	243	295	193	26		193	31	16	

[a] One duplicate individual detected in 2008 brood stock was excluded from parentage analyses.

[b] Includes four age-0$^+$ steelhead sampled at the West Fork Yankee Fork screw trap in 2008.

Future Work

- Broodstock
  - 100% genetically sampled
- Juveniles
  - Upweller
  - Catch Tank
  - Incline Plane Screen Trap
  - Rotary Screw Trap
- Adults
  - Weirs
  - Sonar (DIDSON)
  - Hook & Line
  - Trammel Nets
  - Creel Surveys

Questions