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October 29, 2013

MEMORANDUM

TO: Council Members

FROM: Jeff Allen, Idaho Council Office Director and Policy Analyst

SUBJECT: Update on the Redfish Lake Sockeye Hatchery in Springfield, ID.

Idaho Department of Fish and Game Assistant Fisheries Chief Paul Kline will provide an update on: 1) the completion of Springfield Hatchery and 2) how the new facility will change the implementation of the Snake River sockeye salmon recovery program.

For the past two decades since the ESA listing, a group of agencies including IDFG, NMFS, and the Shoshone-Bannock Tribes (SBT) have been collaboratively engaged in the captive broodstock-based gene rescue program to recover Snake River sockeye salmon. Funding for the program is primarily provided by the Bonneville Power Administration (BPA) through the Northwest Power and Conservation Council's Columbia River Fish and Wildlife Program. The near-term goal of the program is to avoid extinction and to maintain population genetic diversity. The long-term goal is to rebuild the naturally-spawning population to facilitate de-listing and to increase population abundance to levels that could support sport and tribal harvest in the future.

To effectively address the program's long-term goal, the 73-acre Springfield Fish Hatchery site was purchased by the Bonneville Power Administration in 2010. Using a design-build approach, the IDFG worked with contractors to plan, design, and build a new hatchery capable of producing up to 1 M sockeye salmon smolts annually. The \$13.5 M facility is scheduled to be complete and ready to receive eggs in December, 2013. Annually, IDFG and NMFS broodstock hatcheries will provide eyed-eggs to Springfield. Smolts produced at Springfield will be transferred to the Sawtooth Valley each spring and released to the outlet of Redfish Lake. Adult sockeye salmon (produced from smolts reared at the new facility) will begin returning to Idaho in 2017.

From this point forward, the recovery program will follow a tiered approach to rebuild numbers of naturally-spawning sockeye salmon including: (1) increasing the number of anadromous adult sockeye that return to Idaho; (2) incorporating more anadromous returns in hatchery spawning designs and increasing natural spawning escapement; and (3) moving towards the development of an integrated conservation hatchery program that achieves the Hatchery Scientific Review Group-recommended proportionate natural influence (PNI) levels.

The proposed hatchery strategy is designed to address the key viable salmonid population parameters of abundance, spatial structure and diversity. The approach emphasizes improving abundance as the hatchery program transitions from the existing captive broodstock to a conventional hatchery program. This will be achieved by first focusing actions on Redfish Lake, the lake with the highest sockeye production potential. Improvements in spatial structure and sockeye life-history diversity will be gained by implementing hatchery actions to restore natural production in two additional lakes, Pettit and Alturas.

Chronology of relevant events:

- November, 2010: The Idaho Department of Fish and Game (IDFG) submits the Snake River Sockeye Program - Springfield Sockeye Hatchery Master Plan (Step 1 Document) to the Northwest Power and Conservation Council (Council).
- April, 2011: The Council approves the Master Plan and authorizes IDFG to move forward with the next steps required under the Major Projects Review Process.
- April, 2012: IDFG submits combined Step 2 and Step 3 Documents to the Council.
- June, 2012: The Council approves the project to go to construction.
 - Approval to initiate fish culture operations at Springfield Hatchery is conditioned on IDFG providing additional clarification on several ISRP comments prior to the start of hatchery operations in December, 2013. This request will be satisfied.
- June, 2012: Construction at the Springfield site begins.
- September 6, 2013: Official dedication of Springfield Hatchery. Over 150 people attend celebration.
- December 2, 2013: Estimated ship date of first ESA-listed sockeye salmon eyed-eggs to Springfield Hatchery.
- May, 2015: Estimated ship date of first cohort of “Springfield smolts” to Redfish Lake Creek for release.
- July, 2017: Estimated return date of first cohort of “Springfield adults” to Redfish Lake as 4-yr olds.



SNAKE RIVER SOCKEYE SALMON PROGRAM: TRANSITIONING FROM CONSERVATION TO RECOVERY

November 6, 2013
Northwest Power and Conservation Council
Boise, ID

Paul A. Kline - Idaho Fish and Game

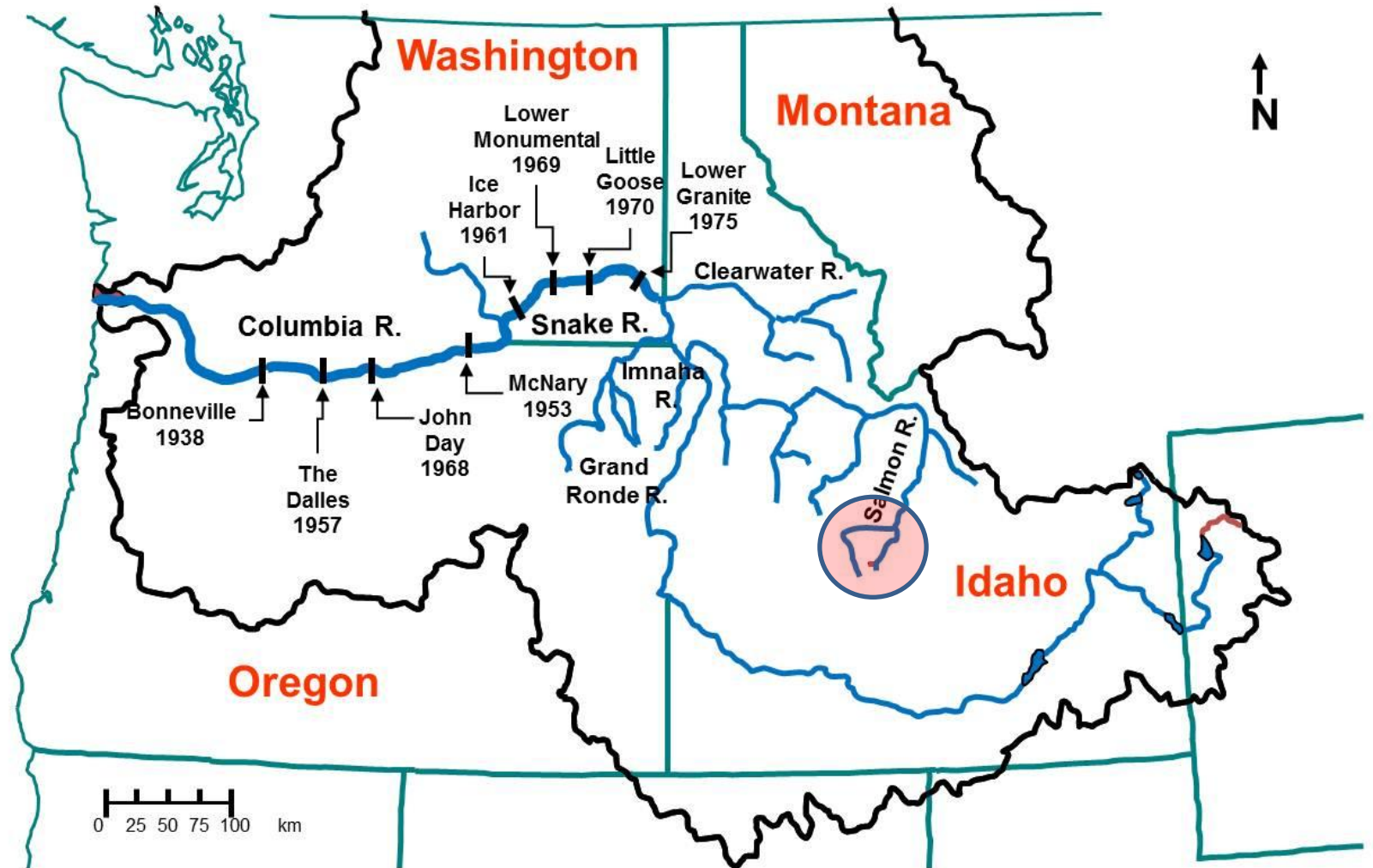


Today's Presentation Format

- Orientation & Introduction
- Captive Broodstock Phase (*Phase 1*)
- Future Direction - new hatchery and beyond
 - Re-colonization Phase (*Phase 2*)
 - Local Adaptation Phase (*Phase 3*)
- Overview of new Springfield Hatchery

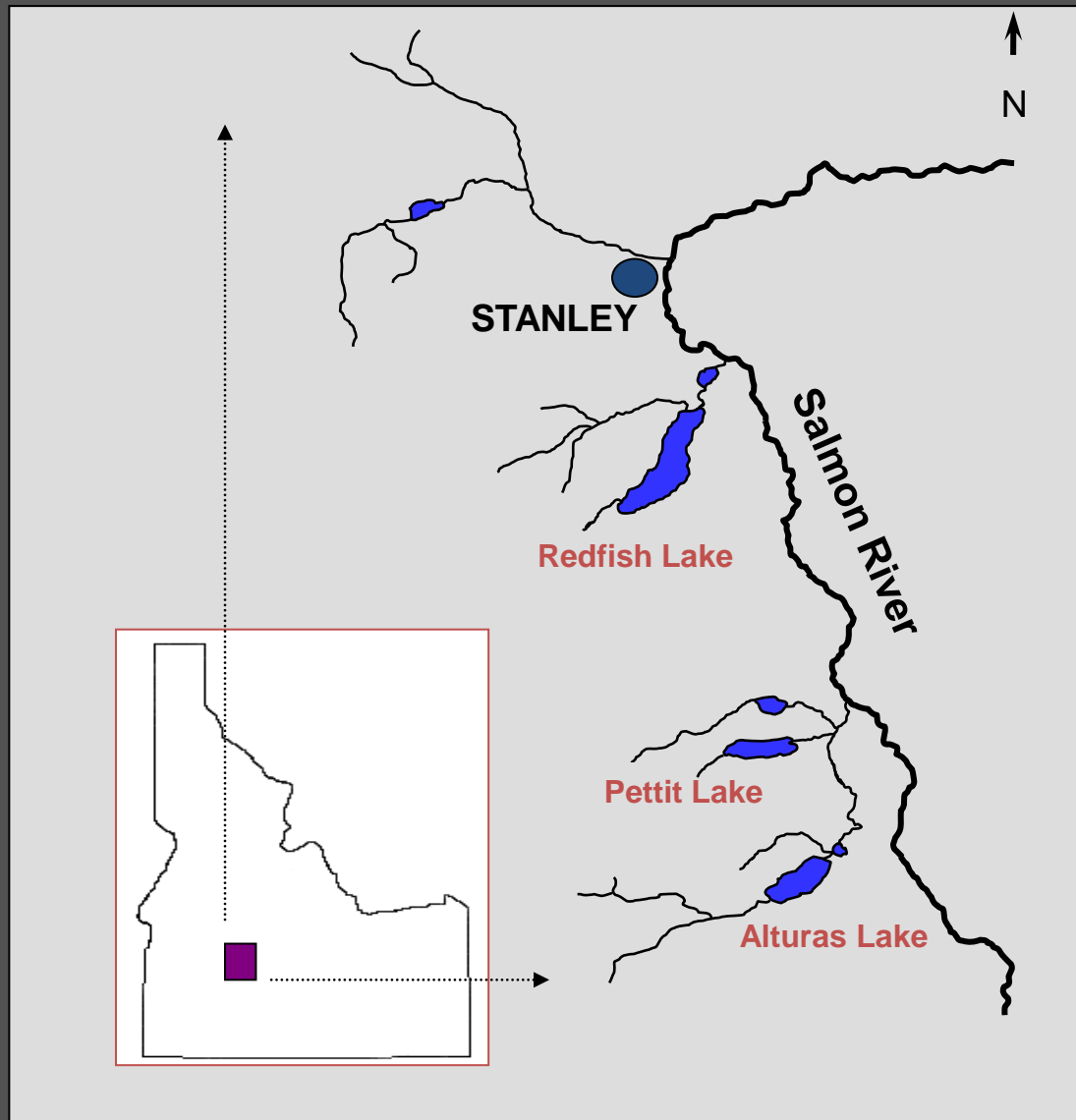


Orientation





Orientation



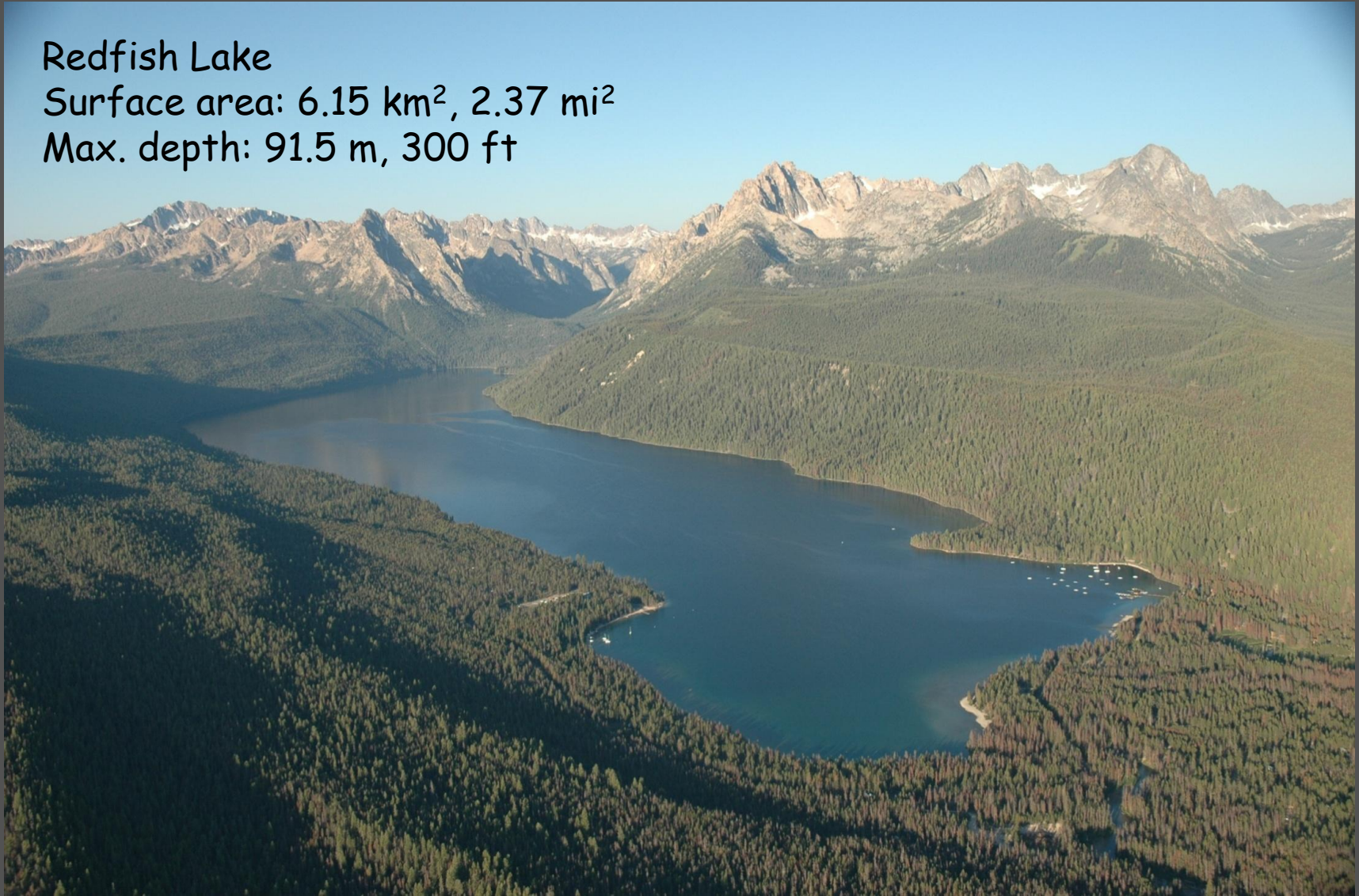


Orientation

Redfish Lake

Surface area: 6.15 km², 2.37 mi²

Max. depth: 91.5 m, 300 ft





Orientation

Alturas Lake

Surface area: 3.38 km², 1.30 mi²

Max. depth: 53.0 m, 174.0 ft





Orientation

Pettit Lake

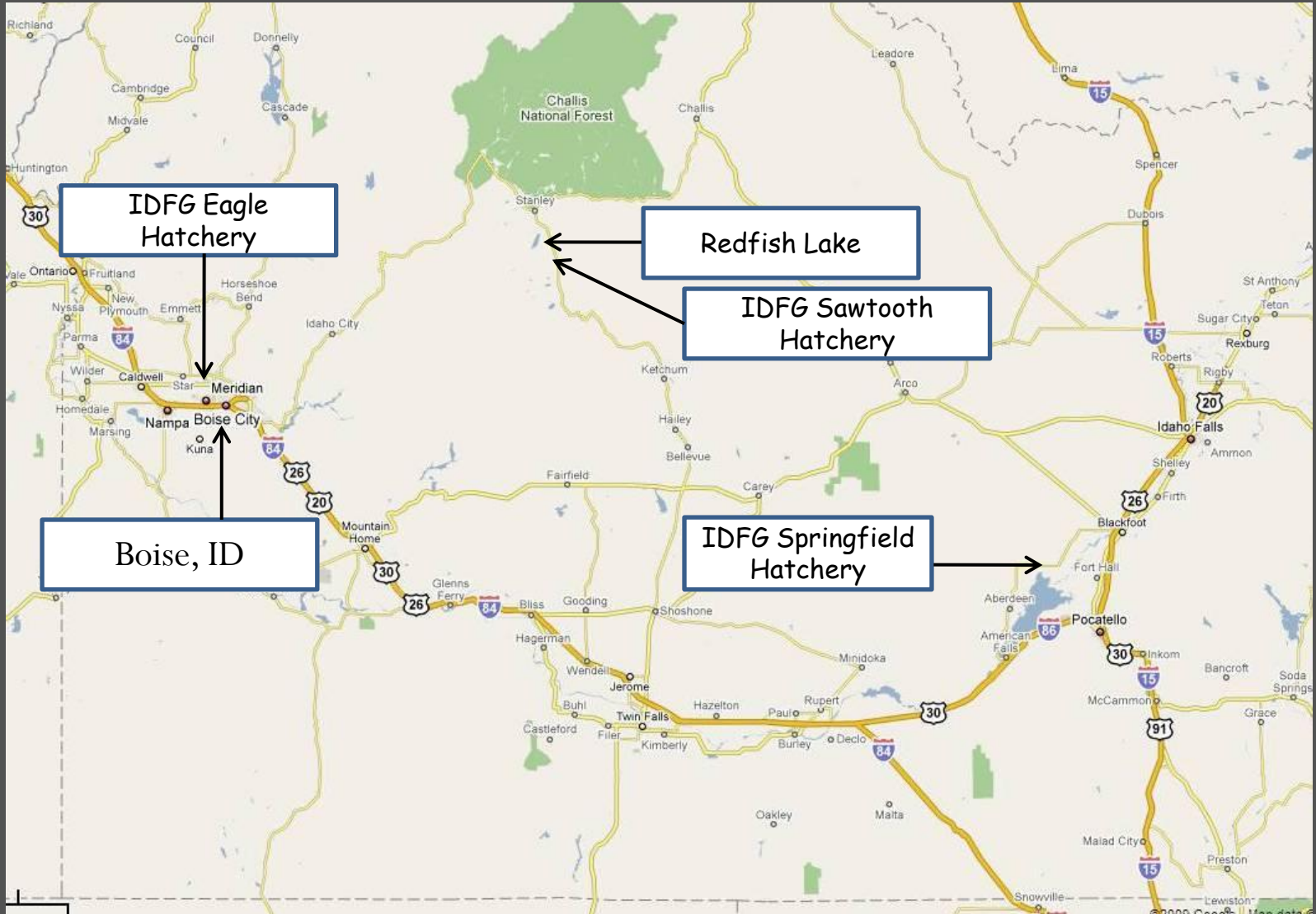
Surface area: 1.62 km², 0.63 mi²

Max. depth: 52 m, 170 ft





Orientation





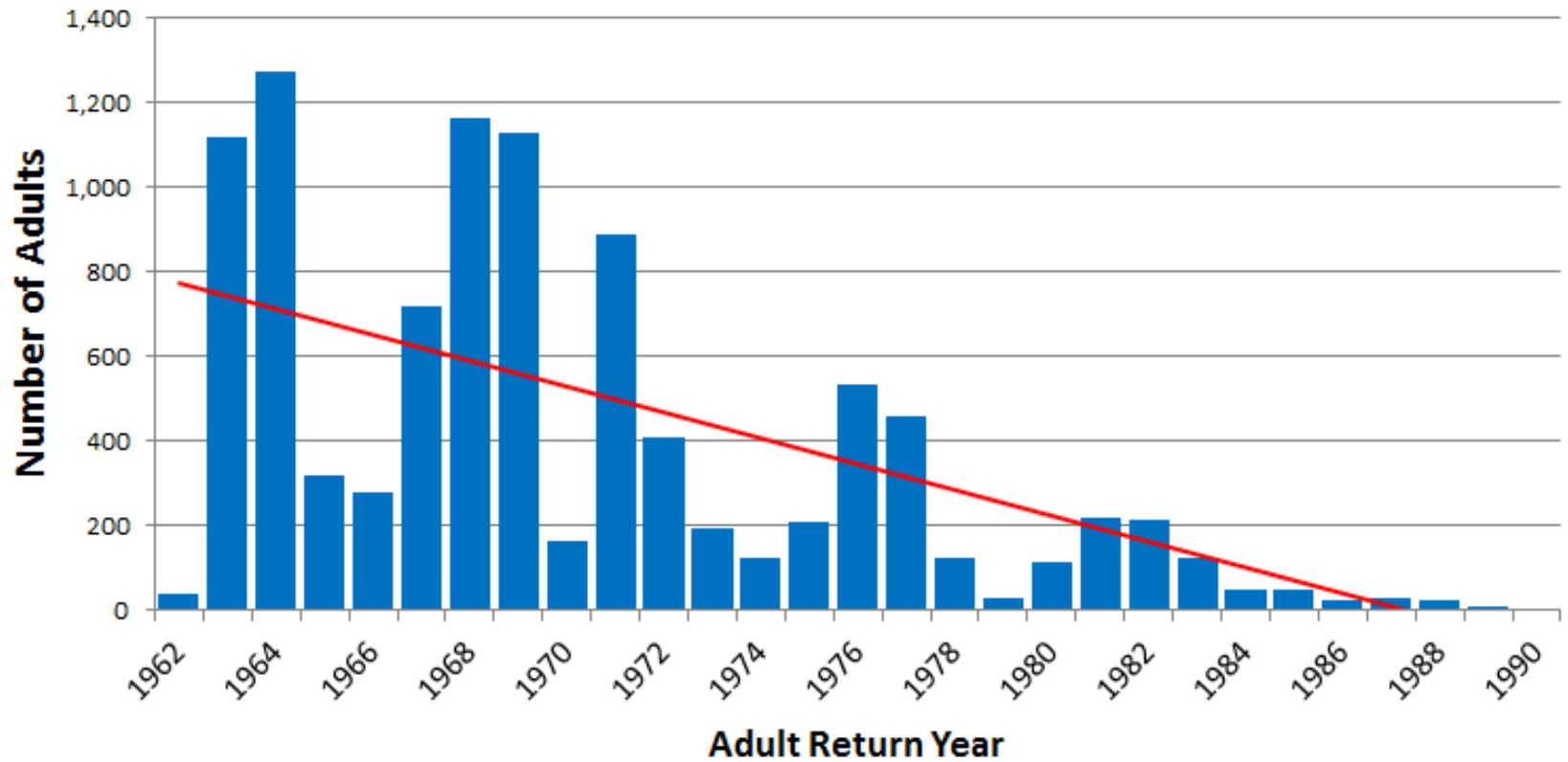
Introduction





Introduction

Adult sockeye salmon returning to Idaho 1962 - 1990
(Snake River dam counts)





Introduction

- November 1991, Snake River sockeye salmon listed as Endangered under the ESA
- Current Captive Broodstock conservation program (Phase 1) initiated in same year





Phase 1: Captive Broodstock

- In Phase 1, conservation hatchery protocols established early-on to protect the remnant population
- Protocols included:
 - BMPs to rear sockeye in captivity
 - Redundant broodstocks (IDFG and NMFS)
 - Spawning plans that maintain genetic diversity and avoid inbreeding
 - 100% fish health screening
 - Creation of multi-agency technical team



Phase 1: Captive Broodstock

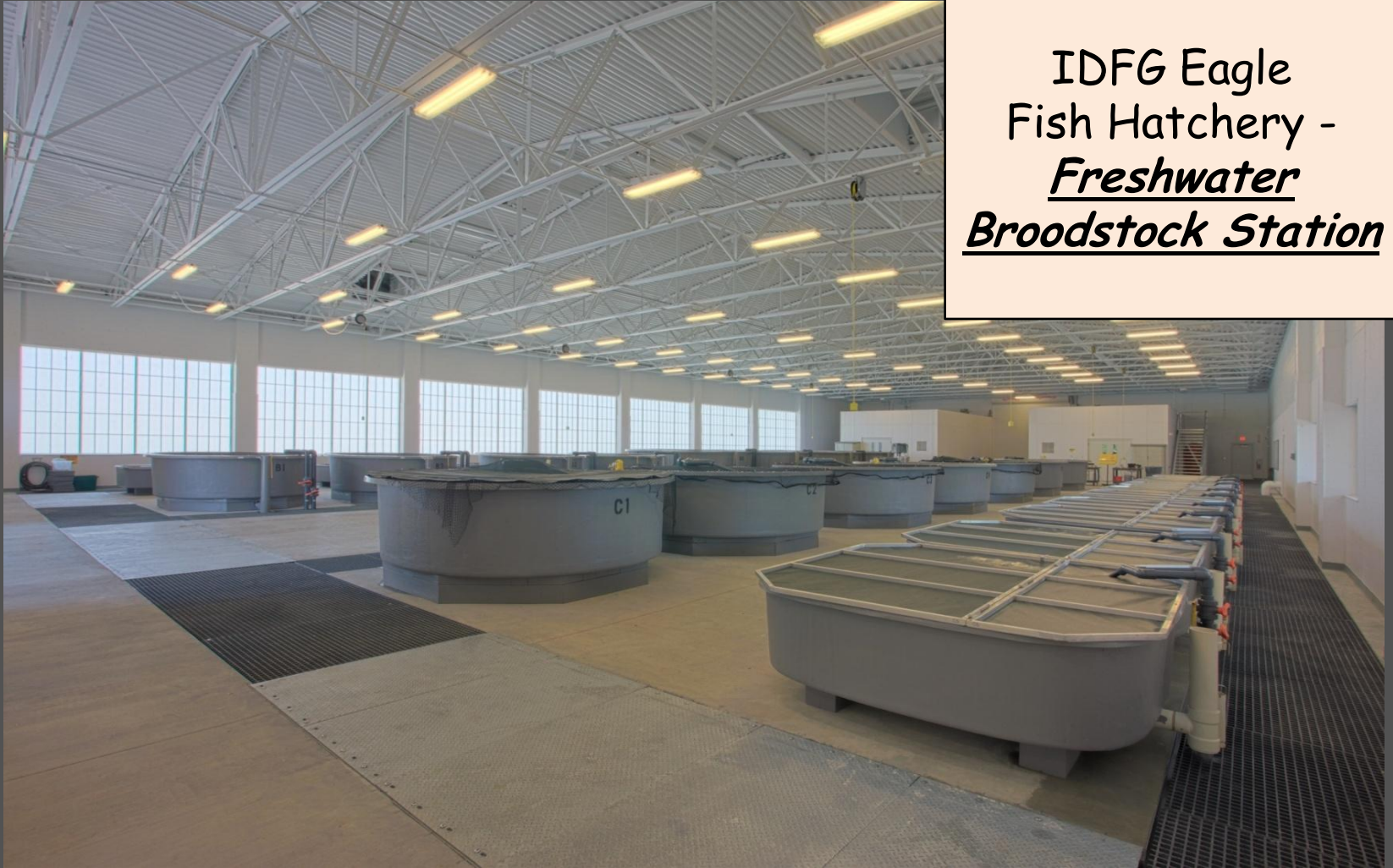


IDFG Eagle
Fish Hatchery -
Freshwater
Broodstock Station



Phase 1: Captive Broodstock

IDFG Eagle
Fish Hatchery -
Freshwater
Broodstock Station





Phase 1: Captive Broodstock



NMFS Manchester
Research Station -
Seawater
Broodstock Station





Phase 1: Captive Broodstock



NMFS Burley Creek
Hatchery -
Freshwater
Broodstock Station





Phase 1: Captive Broodstock



IDFG Sawtooth
Fish Hatchery -
Borrowed
rearing space



Phase 1: Captive Broodstock

ODFW Oxbow Hatchery -
Borrowed
rearing space





Phase 1: Captive Broodstock

- Each year, at IDFG and NMFS broodstock facilities, personnel, "rebuild" the captive broodstock by spawning adults that mature in captivity along with a portion of the anadromous adults that return
- This creates the next generation of sockeye salmon to mature, full-term, in captivity and...
- Produces additional eggs above and beyond broodstock needs to allocate to different reintroduction strategies - experimentally



Phase 1: Captive Broodstock

- Adult releases





Phase 1: Captive Broodstock

- Eyed-egg releases





Phase 1: Captive Broodstock

- Pre-smolt releases





Phase 1: Captive Broodstock

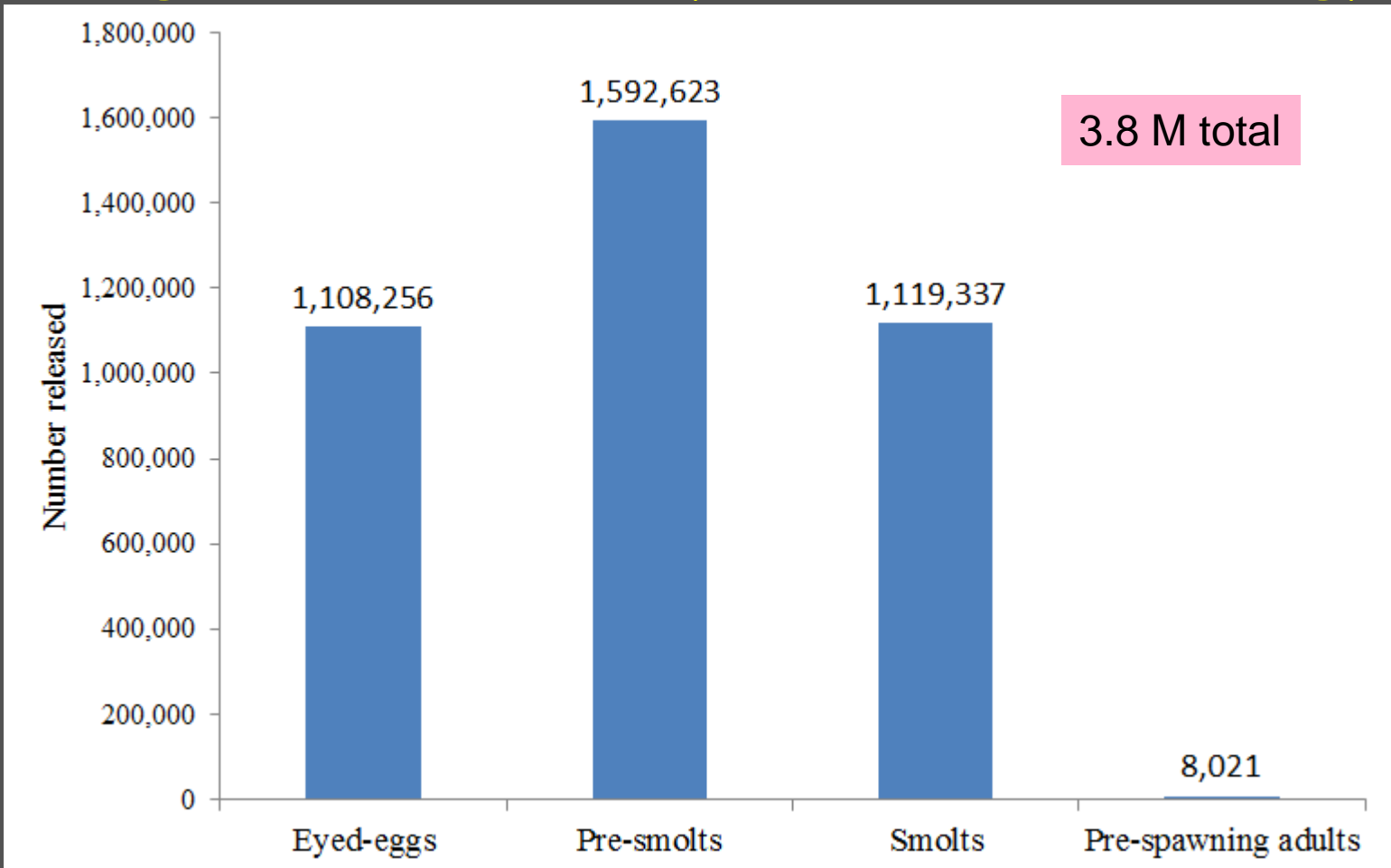
- Smolt releases





Phase 1: Captive Broodstock

Running liberation totals by reintroduction strategy





Phase 1: Captive Broodstock

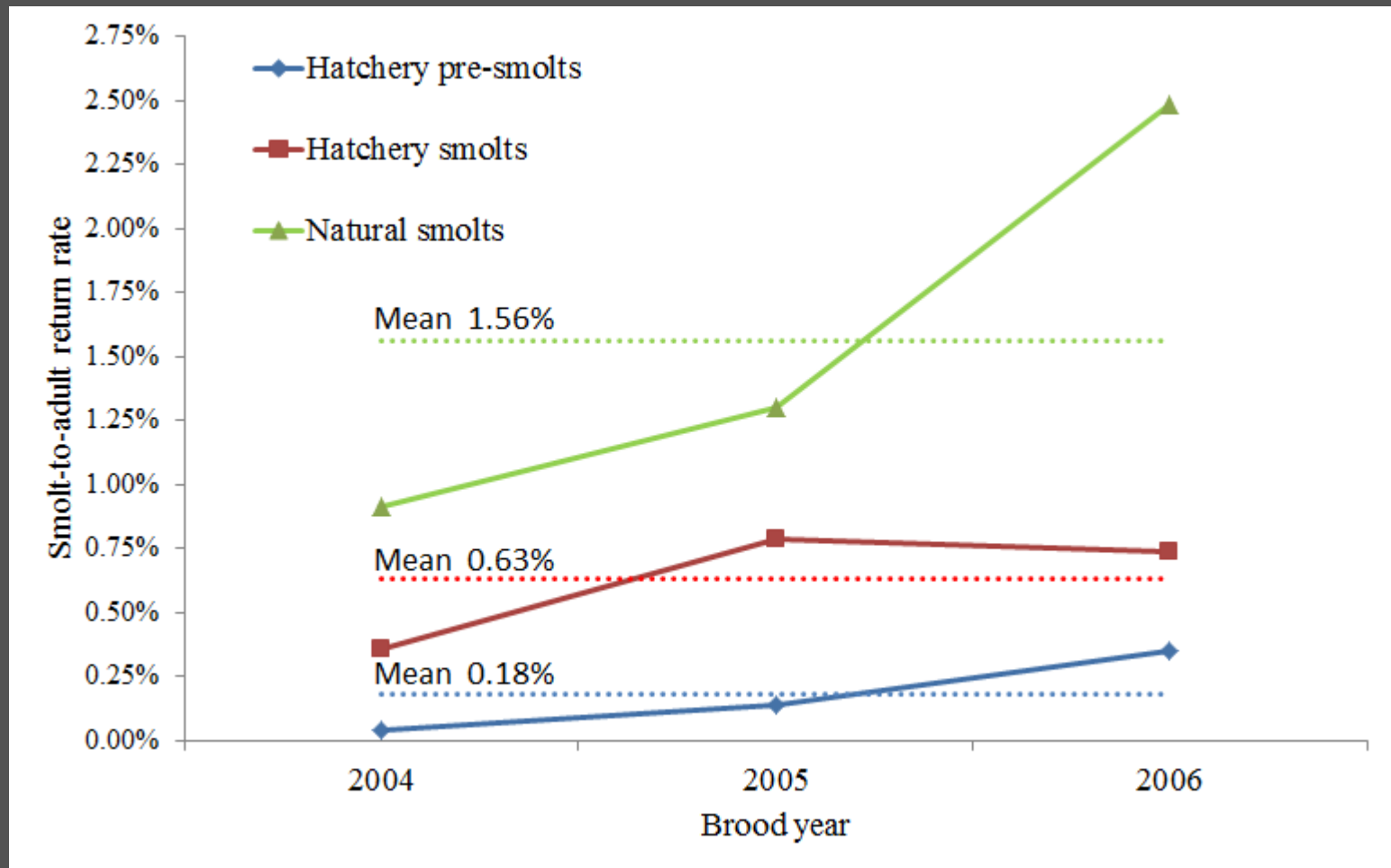
Relative contribution of adults by release strategy
For completed brood years 2004, 2005, and 2006

Reintroduction Strategy	Total Anadromous Returns	Percent of Total
Redfish Lake Pre-smolt release	84	3.3%
Redfish Lake Creek/Salmon River Smolt Release	2,214	85.6%
Naturally-Produced Redfish Lake Smolts	287	11.1%
TOTAL	2,585	100%



Phase 1: Captive Broodstock

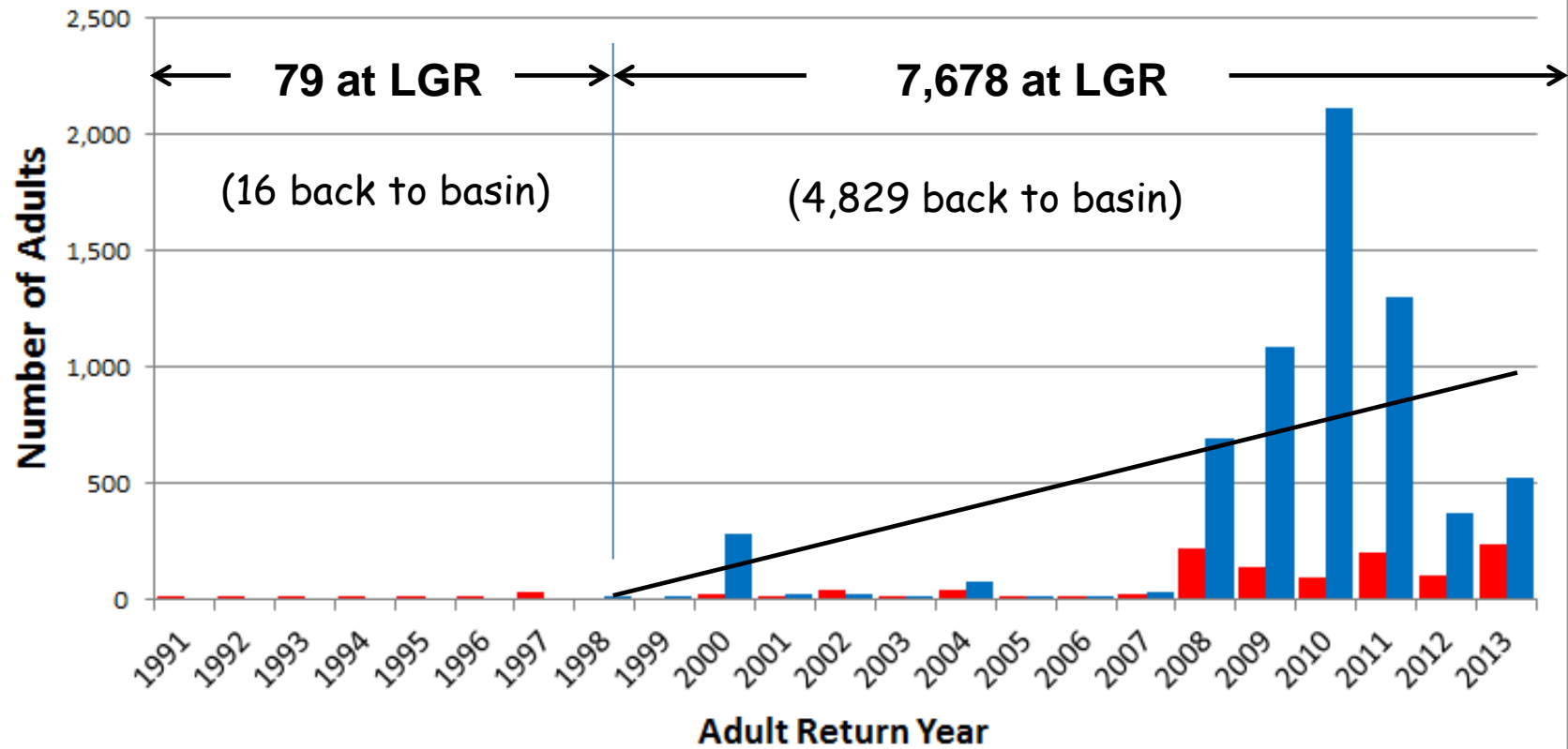
Relative SAR of adult sockeye by release strategy





Phase 1: Captive Broodstock

Adult sockeye salmon returning to Idaho 1991 - 2013
(Snake River dam counts)





Phase 1: Captive Broodstock

- So...Putting the past 20+ years in perspective:
 - The Program has developed conservation aquaculture techniques to raise sockeye full-term to maturation in the hatchery (with high survival)
 - Effectively maintained population genetic diversity and conserved the adaptive potential of the population*
 - Implemented a comprehensive m&e plan that identified smolt releases as the most effective reintroduction strategy

* Kalinowski et al. 2012



Phase 1: Captive Broodstock

- And.....concluded that the primary factor limiting further expansion of the program was the absence of adequate smolt-rearing hatchery space





Phase 1: Captive Broodstock

"The proposed hatchery strategy is the keystone of the document and appears to be well and thoroughly thought through. Appropriately, the stocking of life stages other than smolts will be discontinued, as they have not performed well in the past"

ISRP 2011-2



Turning the page - the future...

- Idaho State Accord finalized in 2008
- BPA purchases Springfield Hatchery site in 2010
- IDFG initiates 3-Step Process in 2010
- Council approves project to go to construction in June 2012
- Construction starts immediately and is expected to conclude December 2013



Phased Approach

- Phase 1: Captive broodstock phase (reviewed above)
- Phase 2: Re-colonization phase
- Phase 3: Local Adaptation phase



Phase 2: Re-colonization

- Phase 2: Re-colonization phase
 - Objective to produce large numbers of smolts to generate large numbers of returning anadromous adults
 - Anadromous adults used to re-seed the habitat and to replace captive adults in hatchery spawning designs
 - Sliding scale management will be followed to guide implementation



Phase 2: Re-colonization

- Production of smolts will increase to 1 million from approximately 200,000 (5-fold increase)
- HSRG guidelines for pHOS - the proportion of hatchery fish in the habitat will not be enforced during the Phase 2
- To maintain genetic continuity between hatchery and natural spawning components 10% of the hatchery broodstock will be comprised of natural-origin anadromous adults



Phase 2: Re-colonization

- Expected Phase 2 outcomes:
 - Grow and stabilize natural spawning in the habitat
 - Transition to spawning only anadromous returns in the hatchery (captive broodstock becomes a safety net)
 - Generate average returns of 5,000 hatchery-origin anadromous adults and 750 natural-origin anadromous adults annually



Phase 2/3 Triggers

- Phase 3 will begin when:
 - 5-yr geometric mean return = 1,000 anadromous adults - ramp down NMFS
 - 5-yr geometric mean return = 2,150 anadromous adults - ramp down IDFG
 - 5-yr geometric mean return of natural-origin anadromous adults = 750
 - Earliest this could happen is 2021



Phase 3: Local Adaptation

- Objective to develop an integrated program that follows HSRG guidance for all variables: pHOS, pNOB, and PNI
- Smolt production reduced to 400,000 to 600,000
- Test assumptions that local adaptation and integrated broodstock management can effectively grow the natural population to sustainable levels that effectively address recovery objectives



Phase 3: Local Adaptation

- Expected Phase 3 outcomes:
 - Average natural-origin adult returns = 1,122
 - Average hatchery-origin adult returns = 5,384
 - NMFS minimum abundance threshold for Redfish Lake = 1,000
 - Pettit and Alturas lake objectives addressed



Springfield Hatchery, 2010





Springfield Hatchery, 2012





Springfield Hatchery, 2012





Springfield Hatchery, 2012





Springfield Hatchery, 2012





Springfield Hatchery, 2012





Springfield Hatchery, 2012





Springfield Hatchery, 2013





Springfield Hatchery, 2013



**SPRINGFIELD
FISH HATCHERY**
Enhancing Idaho's Fisheries Resources



10/16/2013 07:22



Springfield Hatchery, 2013





Springfield Hatchery, 2013





Springfield Hatchery, 2013





Springfield Hatchery, 2013

