Northwest Power and Conservation Council

September 9, 2010

MEMORANDUM

TO: Fish and Wildlife Committee members

SUBJECT: Snake River Sockeye Recovery - Challenges and uncertainties associated with expanding production: Paul Kline, Idaho Department of Fish and Game

Paul Kline will provide an update on this year's return of adult Snake River sockeye salmon and review progress made toward completing the Step One Master Plan for the expanded project. Mr. Kline will also discuss challenges facing the program as it expands beyond its genetic conservation focus to include a comparatively large production element capable of producing up to 1 million sockeye smolts annually. The ability of the habitat to receive increased numbers of hatchery-produced smolts as well as to accommodate increased returns of anadromous adults will be addressed. Additionally, the "readiness" of specific program infrastructure (including adult and juvenile fish traps, holding pens, and fish transportation equipment) to meet the needs of an expanded program will be discussed. Mr. Kline will also provide an overview of Idaho's stepped approach to addressing recovery objectives for this ESA-listed species.

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Snake River Sockeye Recovery

Managing the challenges of an expanding program

Paul Kline
Idaho Department of Fish and Game

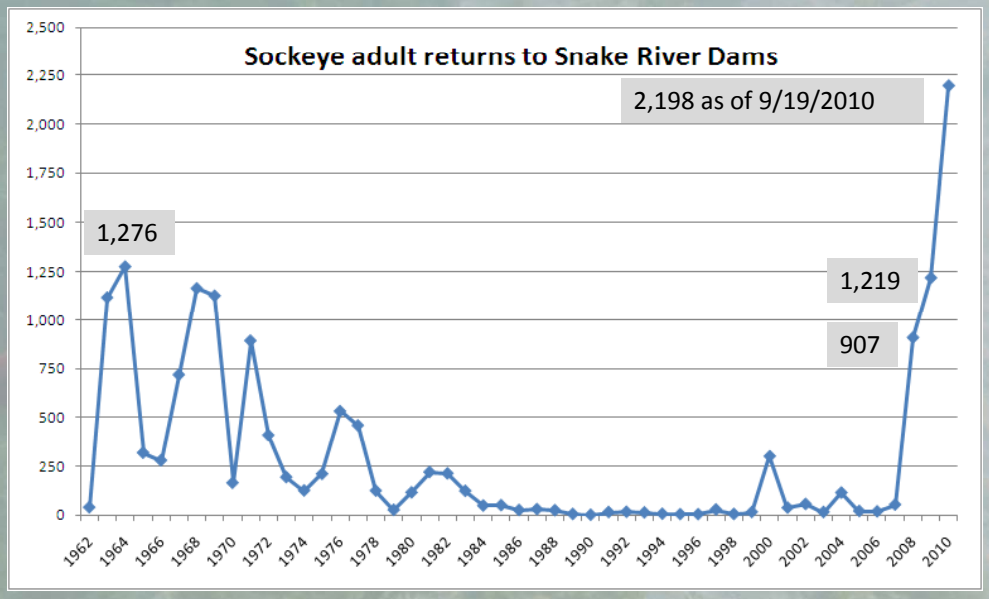
Tom Flagg
NOAA Fisheries

Northwest Fisheries Science Center
NOAA Fisheries Service

Orientation

1. 2010 adult sockeye return update
2. NPCC 3-step process
   a. Review time-line to complete Step-1 Master Plan
3. Program expansion planning
   a. Discuss challenges and considerations
4. Recovery planning for S.R. sockeye
   a. Review Idaho's step-wise approach
5. ODFW Oxbow Hatchery sockeye loss

1. 2010 Adult Returns



1. 2010 Adult Returns

- Lower Granite Dam is approximately ½ the total 900+ mile distance from the ocean to spawning habitat
- On average, 60% of the fish passing LGR survive the last half of the distance to the Stanley Basin
- So far this year, approximately 1,280 of the 2,198 adults counted at LGR have been accounted for (58%)

1. 2010 Adult Returns

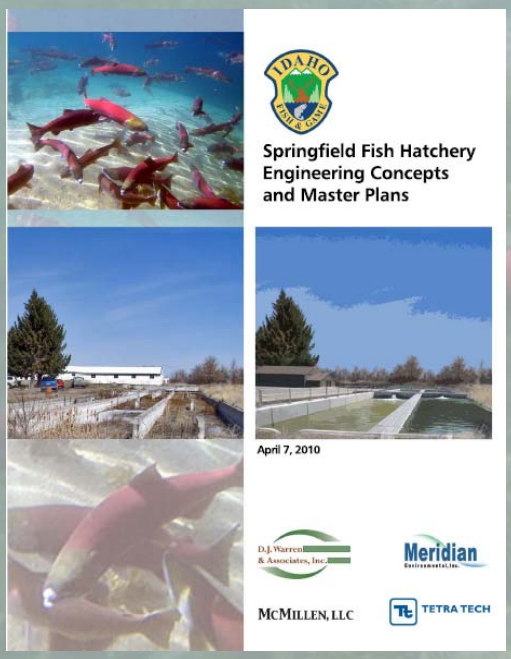
- First year adult sockeye were passed directly upstream of the trap on Redfish Lake Creek to enter the lake on their own

1. 2010 Adult Returns

1. 2010 Adult Returns

- Anadromous adult summary
  - 1,160 anadromous adults released to spawn naturally in Redfish Lake
  - 97 retained to incorporate in spawning program
  - ~100 estimated in river (not trapped yet)
- Hatchery adult release summary
  - 159 captive adults (NOAA) released for spawning
  - 175 captive adults (IDFG) released for spawning
- Total adults in Redfish Lake: 1,494

2. NPCC 3-Step Progress



Step-1 Master Plan:

Final draft 10/2010

Submittal 11/2010

3. Program Expansion Planning

- Infrastructure needs and challenges
  - Traps, equipment, transportation systems
- Physical habitat uncertainties
  - Can the habitat to support increased production

3. Program Expansion Planning

Infrastructure Challenges – *increased smolt numbers*

release locations?
fish transportation?

3. Program Expansion Planning

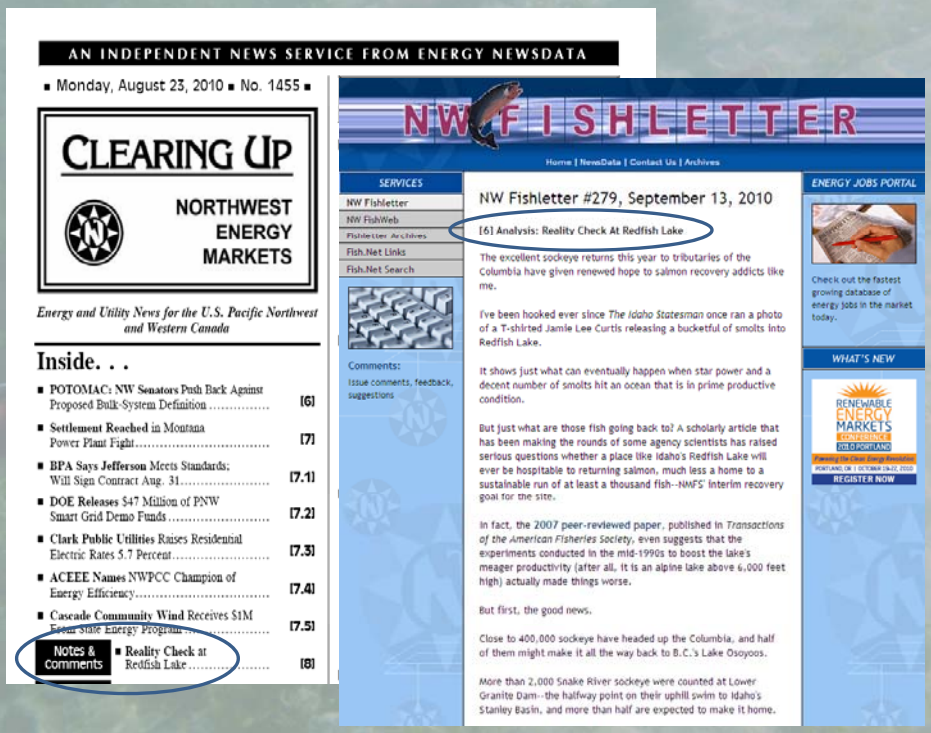
Infrastructure Challenges –
adult trapping facilities

3. Program Expansion Planning

Physical Habitat Uncertainties –
Lake productivity and habitat capacity

- Sockeye nursery lake ecology is well published on - - even for Snake River sockeye salmon
- Some literature on historical sockeye runs to the Stanley Basin of Idaho and the value of marine-derived nutrients to nursery lakes and lake productivity

3. Program Expansion Planning



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▪ Monday, August 23, 2010 ▪ No. 1455 ▪

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NW Fishletter #279, September 13, 2010

[6] Analysis: Reality Check At Redfish Lake

The excellent sockeye returns this year to tributaries of the Columbia have given renewed hope to salmon recovery addicts like me.

I've been hooked ever since *The Idaho Statesman* once ran a photo of a T-shirted Jamie Lee Curtis releasing a bucketful of smolts into Redfish Lake.

It shows just what can eventually happen when star power and a decent number of smolts hit an ocean that is in prime productive condition.

But just what are those fish going back to? A scholarly article that has been making the rounds of some agency scientists has raised serious questions whether a place like Idaho's Redfish Lake will ever be hospitable to returning salmon, much less a home to a sustainable run of at least a thousand fish--NMFS' interim recovery goal for the site.

In fact, the 2007 peer-reviewed paper, published in *Transactions of the American Fisheries Society*, even suggests that the experiments conducted in the mid-1990s to boost the lake's meager productivity (after all, it is an alpine lake above 6,000 feet high) actually made things worse.

But first, the good news.

Close to 400,000 sockeye have headed up the Columbia, and half of them might make it all the way back to B.C.'s Lake Osoyoos.

More than 2,000 Snake River sockeye were counted at Lower Granite Dam--the halfway point on their uphill swim to Idaho's Stanley Basin, and more than half are expected to make it home.

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3. Program Expansion Planning

- Questioned the fitness of fish produced in the program at NOAA facility: *"…fish had so little muscle tone, they didn't have enough energy to scrape out a little hole in the gravel to deposit their eggs…"*
  - Recent adult returns, smolt out-migration survival, and smolt-to-adult survival information indicates the population is resilient and cable of responding positively to favorable environmental conditions

3. Program Expansion Planning

- Questioned the ability of Redfish Lake to support expansion effort: *"…the productivity and ecology of the lake have changed and major shifts in the nutrient base (have occurred)."*
  - The author referenced a four-year old paper that identified that the forage base for sockeye salmon had changed over the last 1,500 years.

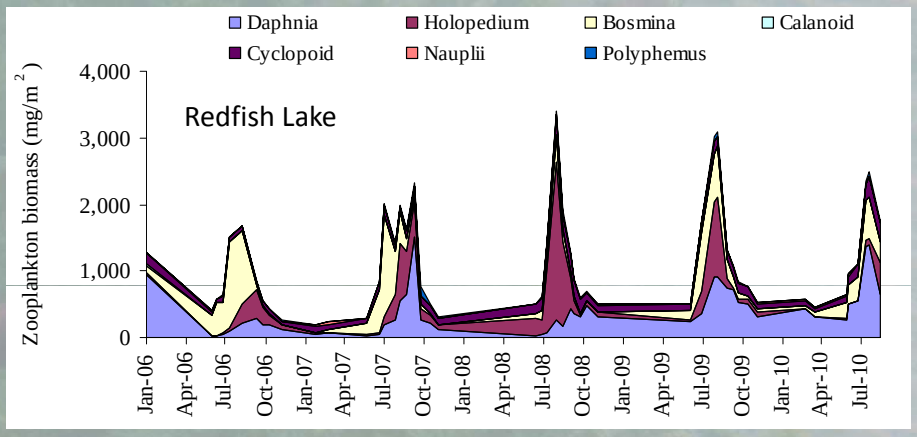
3. Program Expansion Planning

- Can the lake support the expanded program?
  - Pre occupation by western man - over 20,000 sockeye salmon returned to the Stanley Basin
  - During this time, sockeye contributed up to 17% of the annual nutrient load in Redfish Lake
  - Then and now, the vast majority of nutrients comes from stream run off, non-channelized run off, and the atmosphere

3. Program Expansion Planning

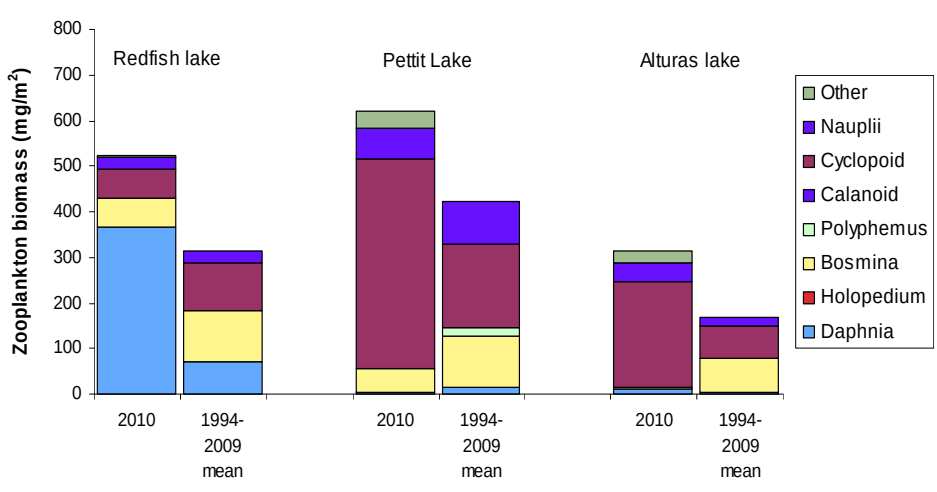
- Can the lake support the expanded program?
  - During the 1990's, the same researchers estimated that less than 2% of the lakes nutrient input was coming from salmon carcasses
  - The authors also stated that zooplankton species composition had shifted to a less nutritious assemblage of species

3. Program Expansion Planning



Information from the Shoshone-Bannock Tribes

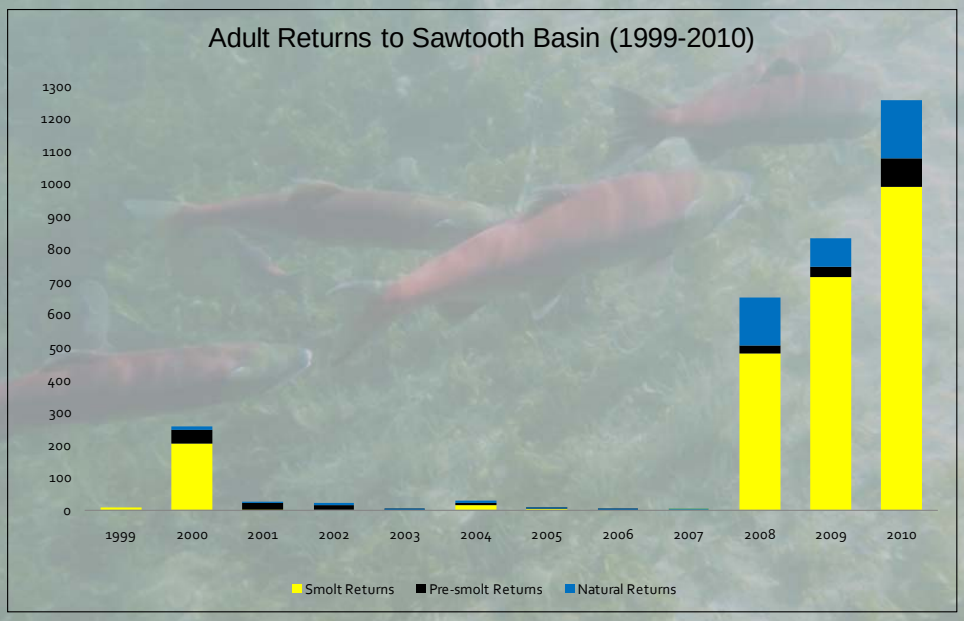
3. Program Expansion Planning



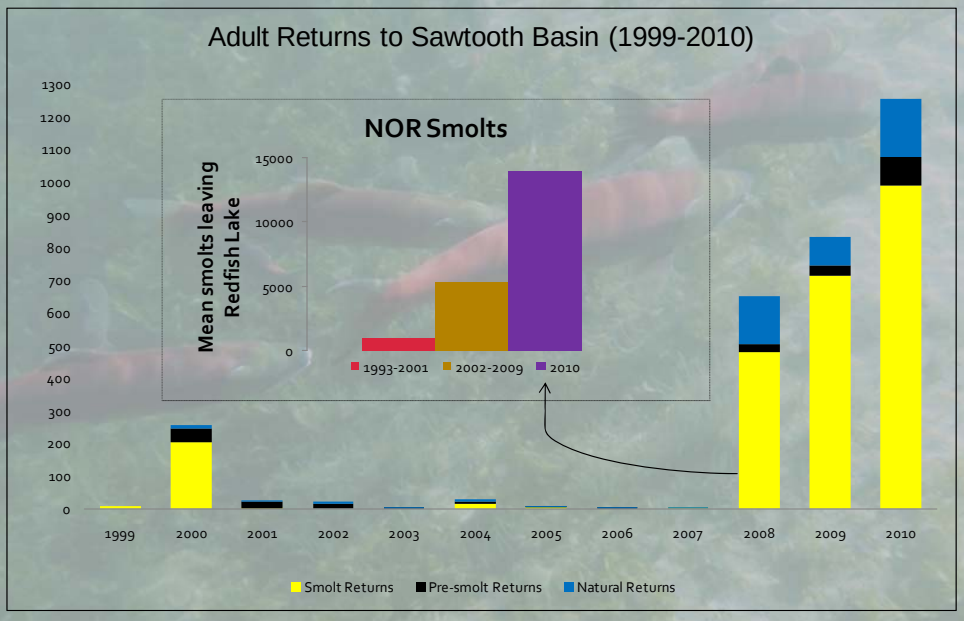
4. Snake River Sockeye Salmon Recovery Planning

- Idaho's Step-wise approach
  - Expanded smolt production
  - Increased use of anadromous adults in hatchery spawning designs (replacing captive adults)
  - Increased use of anadromous adults in the habitat
    - Redfish Lake initially
    - Expand to multiple lake reintroduction program after a period of demonstrated success in RFL
  - Strategy is to take advantage of local adaption and associated fitness improvements

4. Recovery Planning



4. Recovery Planning



5. ODFW Oxbow Hatchery

5. ODFW Oxbow Hatchery

- August 25, 2010 – incident discovered
- 42,218 juvenile sockeye lost (out of 94,826)
- a pressure relief device in the bottom of the pond develop a leak large enough that fish were being drawn into a void underneath the pond.
- Loss will not significantly reduce the number of smolts released in 2011 (compared to the last three years)

Recapping:

1. Successful adult return year (last three years very encouraging)
2. On track to deliver Step-1 Master Plan in November
3. Anticipating challenges/uncertainties that come with expansion
4. The state look forward to working with NOAA to develop an effective recovery plan for Snake River sockeye