Northwest Power and Conservation Council

March 5, 2013

MEMORANDUM

TO: Council members

FROM: Jim Ruff – Manager, Mainstem Passage and River Operations

SUBJECT: Briefing on 2013 Columbia River Basin fish run forecasts and 2012 fishery retrospective

At the March 12, 2013, Council meeting in Portland, Dan Rawding (Fish Program Scientist for the Washington Department of Fish and Wildlife), Ed Schriever (Chief of Fisheries for the Idaho Department of Fish and Game) and Brian Burke (Research Fishery Biologist with NOAA's Northwest Fisheries Science Center) will present the latest information on the 2013 adult salmon and steelhead run forecasts for the Columbia and Snake rivers and a brief summary of expectations for the 2013 fisheries.

Dan Rawding's presentation will cover the 2013 Columbia River run forecasts and will also include a retrospective review of the 2012 adult salmon and steelhead fisheries in the lower Columbia River.

Ed Schriever will then summarize the recent, historical returns of salmon and steelhead to the Snake River Basin, focusing on the species/run groupings of spring, summer, fall Chinook salmon; summer steelhead; and sockeye salmon. For each species/run grouping, counts of fish crossing Lower Granite Dam will be presented. Numbers of fish passing Lower Granite Dam comprise the aggregate count of adult salmon and steelhead destined for eastern Oregon's Grande Ronde and Imnaha river drainages and Idaho's Clearwater and Salmon river drainages. In addition to historical return information, 2013 forecast information for Snake River spring/summer Chinook salmon, summer steelhead, and sockeye salmon will be presented.

Finally, Brian Burke will describe the Northwest Science Center's use of ocean indicator data they have used to develop NOAA's 2013 salmon and steelhead run forecasts. Brian will also explain how NOAA is working with the ocean indicator data and developing tools to help support the regional fish managers (including the *U.S. v. Oregon* TAC), with the eventual goal of transferring these tools over to the salmon managers for their use.

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Columbia River Salmon and Steelhead Returns

Dan Rawding – WA Department of Fish and Wildlife
Ed Schriever – ID Department of Fish and Game
Brian Burke – NOAA's NW Fisheries Science Center
March 12, 2013 Council Meeting in Portland, OR

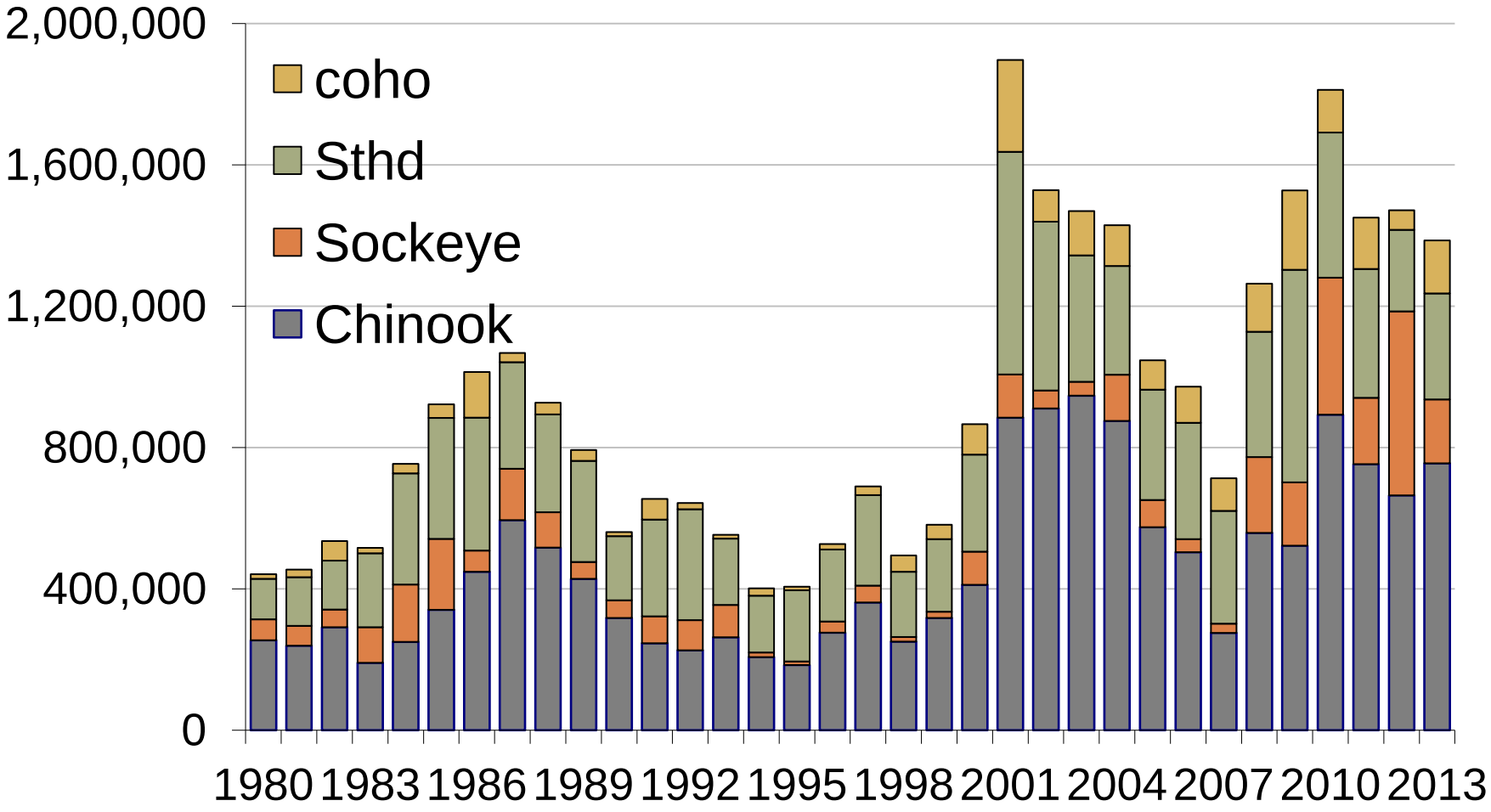
U.S. v Oregon
Technical Advisory Committee

- The U.S. v Oregon Technical Advisory Committee (TAC) consists of staff from federal, tribal and state entities.
- TAC ‘reconstructs’ Columbia River salmon and steelhead returns post season and develops preseason forecasts.
- TAC works to review salmon and steelhead stock status as the runs progress and provides inseason run size updates.
- In 2012, TAC meet 20 times to provide inseason run size updates on spring, summer, fall Chinook and sockeye
- Inseason updates allow managers to adjust fisheries to meet management guidelines (ESA impacts, US v OR allocation , meet spawning escapement goals, etc.)

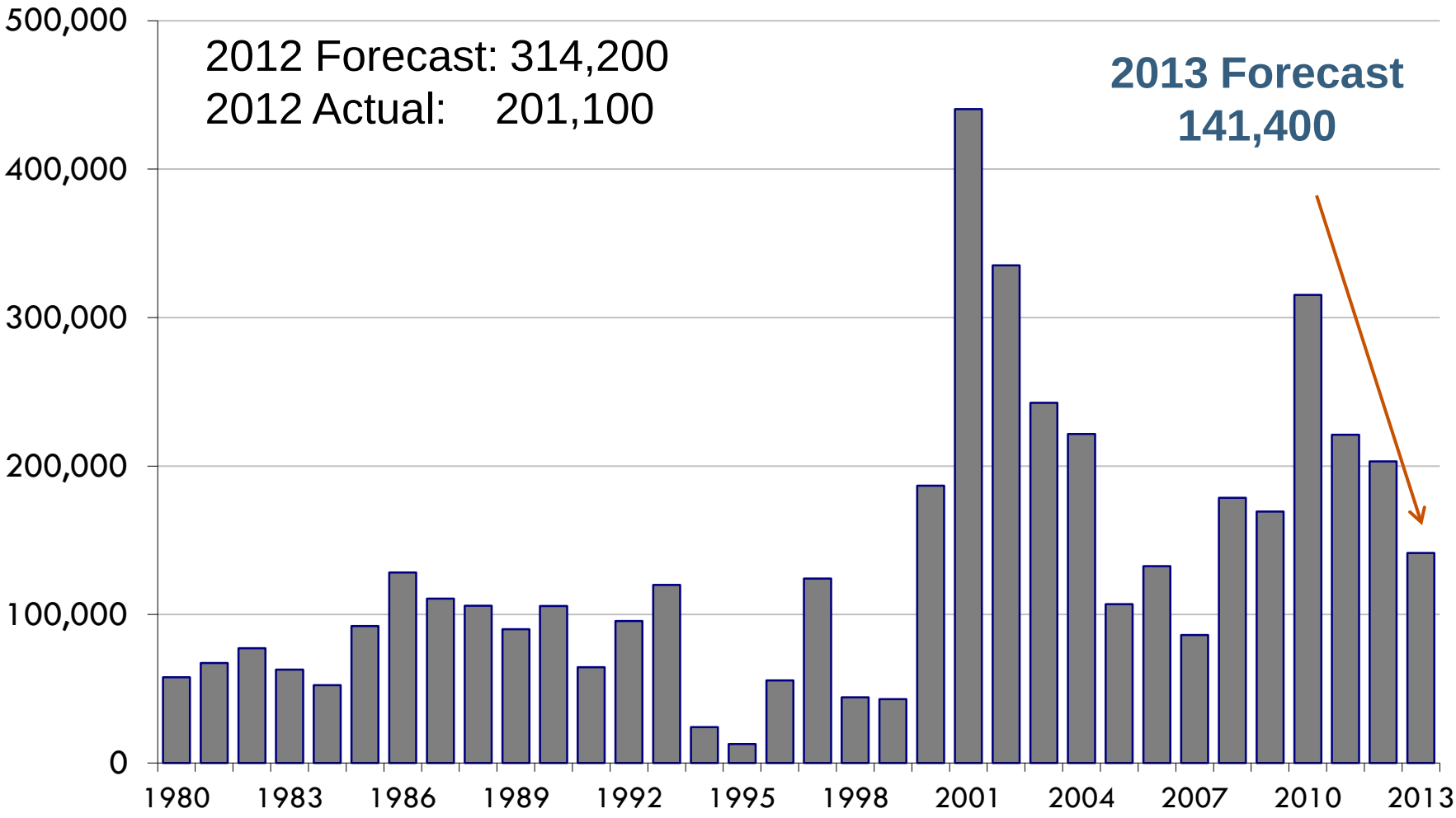
U.S. v Oregon
TAC Members

- Henry Yuen – USFWS
- Tim Roth – USFWS
- Stuart Ellis – CRITFC
- Lytle Denny – SBT
- David Evans – SBT
- Roger Dick Jr. - YN
- Steve Parker – YN
- Joe Oatman – NPT
- Preston Bronson – CTUIR
- Mark Manion – CTWS
- Enrique Patino – NMFS
- Jeremy Jording - NMFS
- Peter Dygert – NMFS
- Robin Ehlke – WDFW
- Cindy LeFleur – WDFW
- Ron Roler – WDFW
- Alan Byrne – IDFG
- Sam Sharr – IDFG
- Kathryn Kostow – ODFW
- John North – ODFW

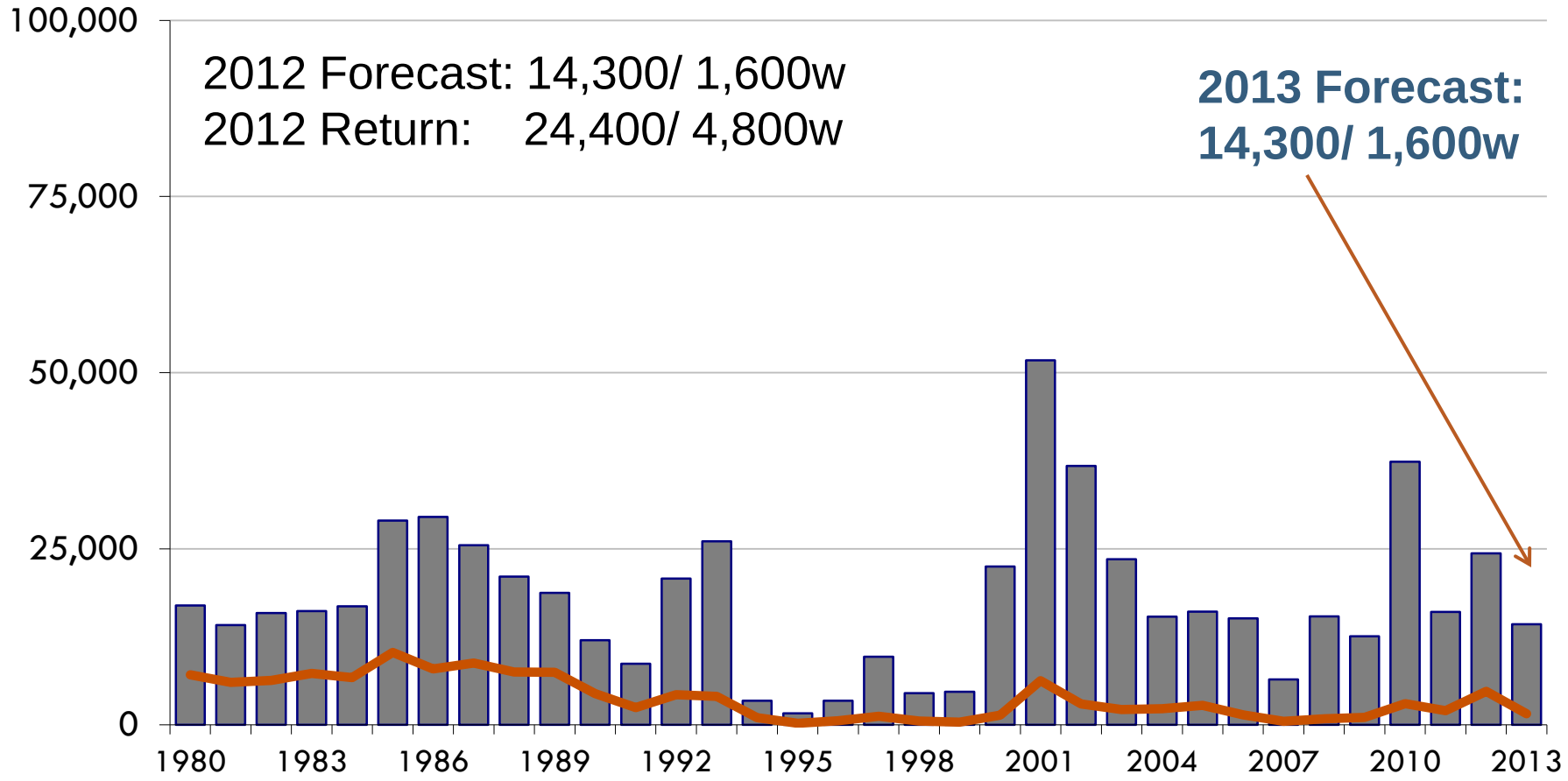
Upriver Salmonid Returns



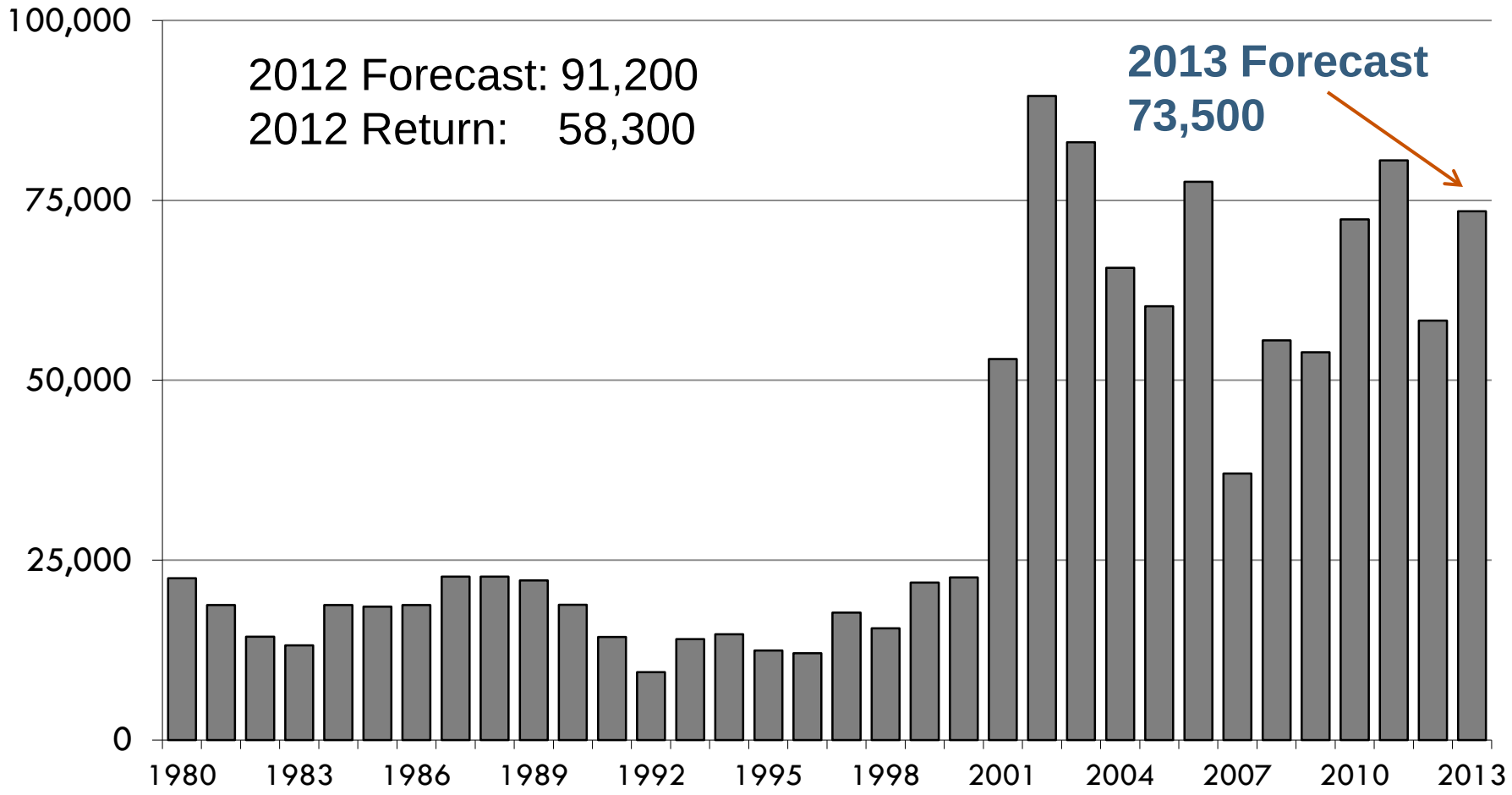
Upriver Spring Chinook



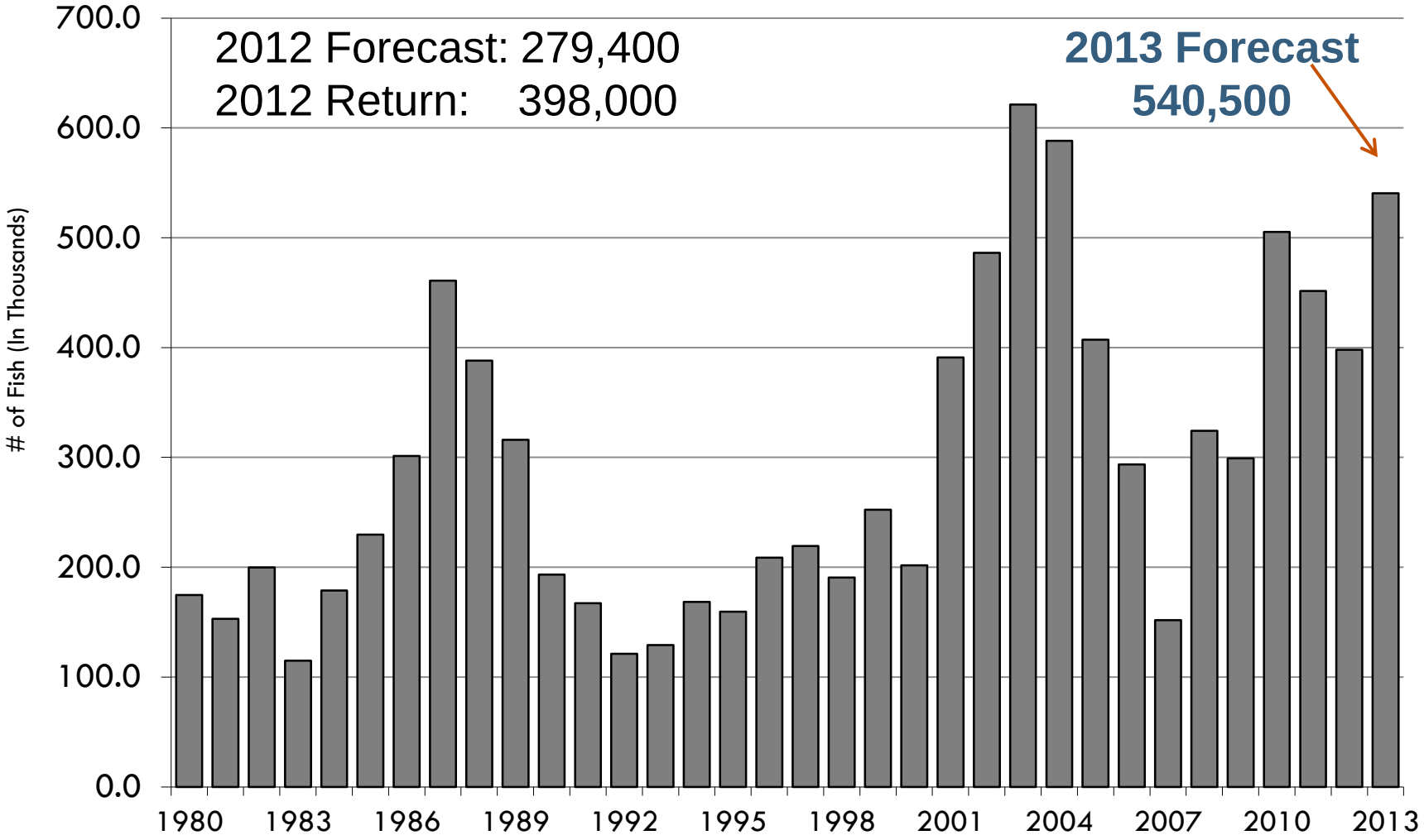
Upper Columbia Spring Chinook



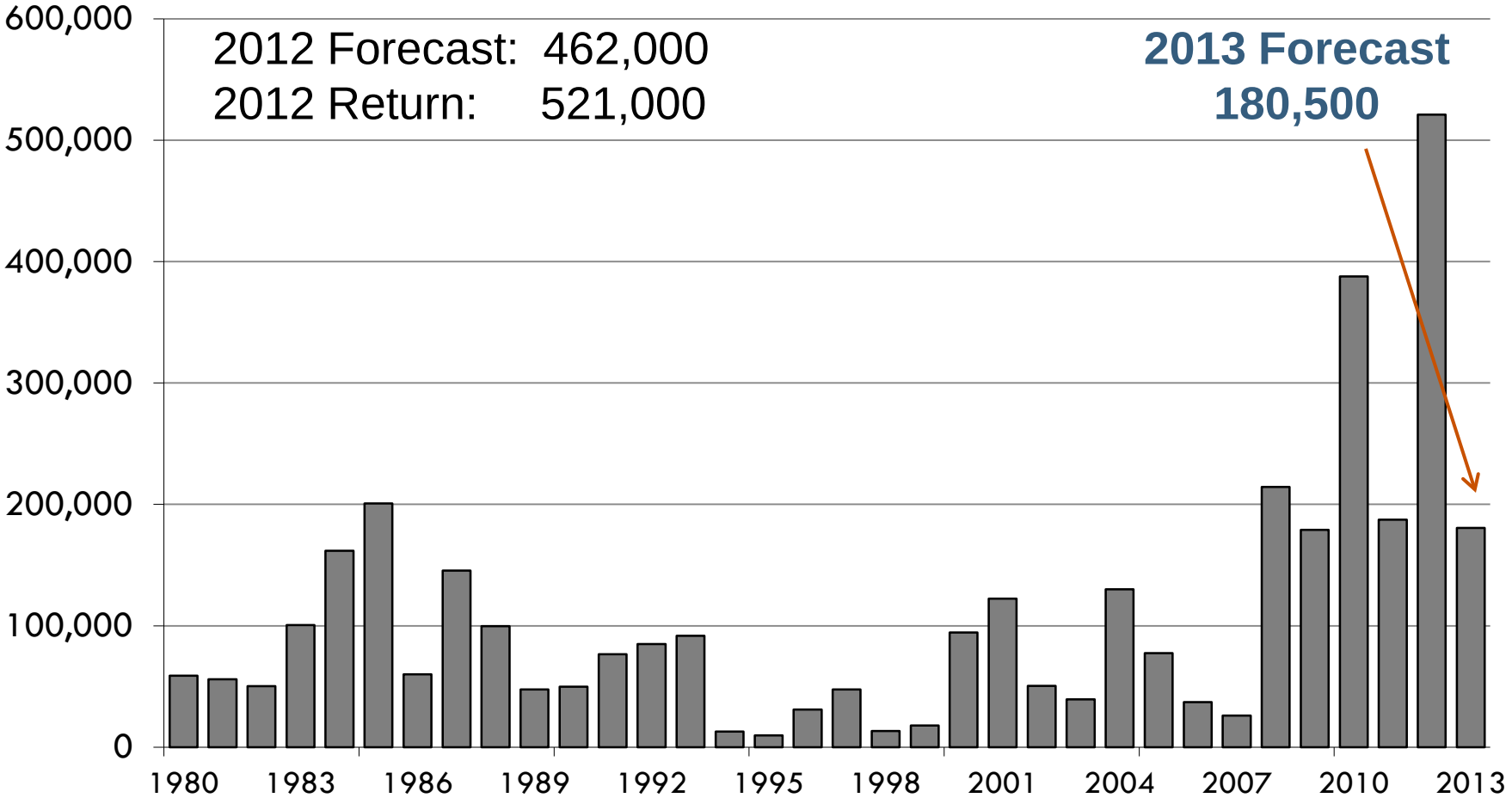
Upper Columbia Summer Chinook



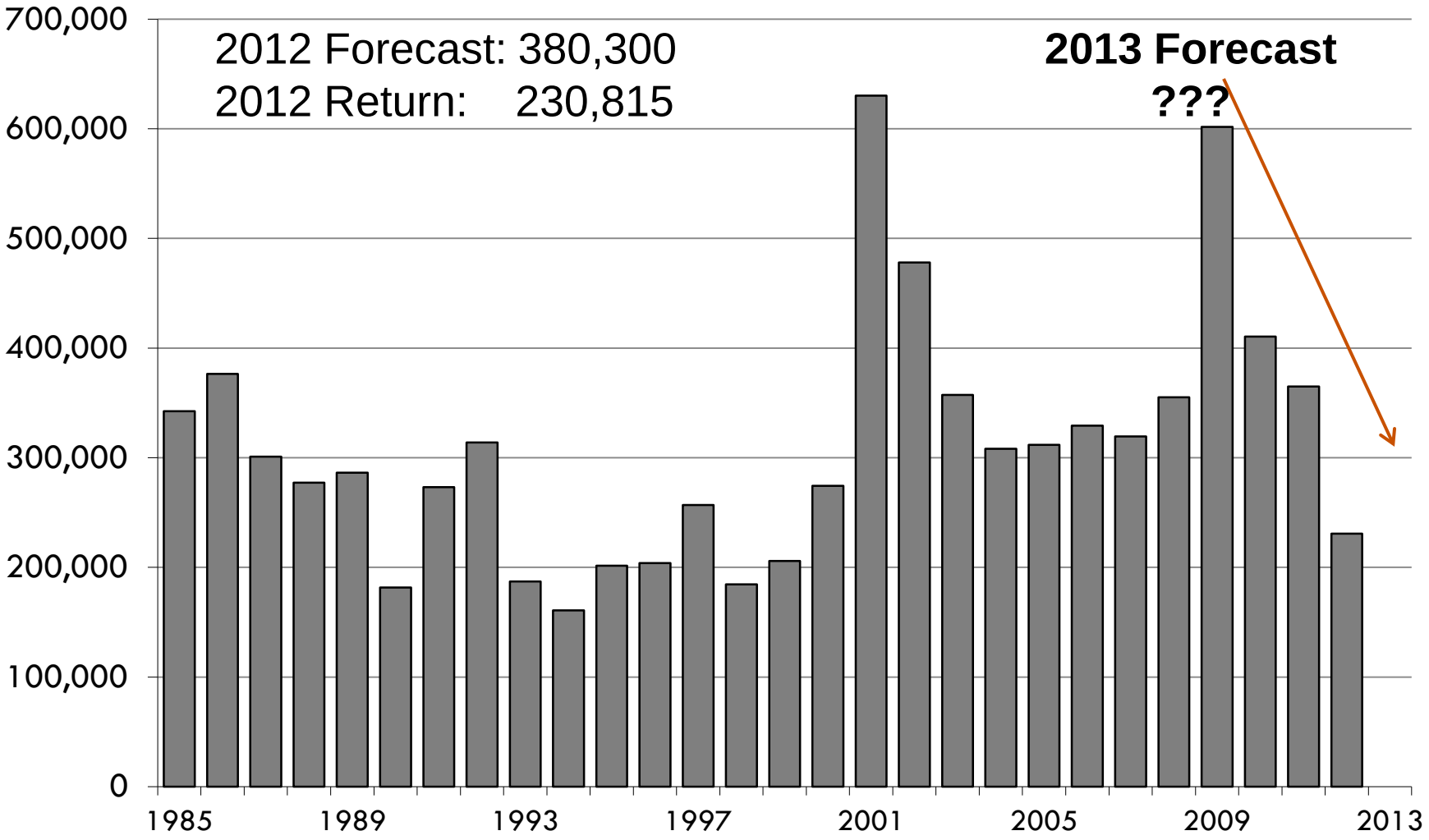
Upriver Fall Chinook



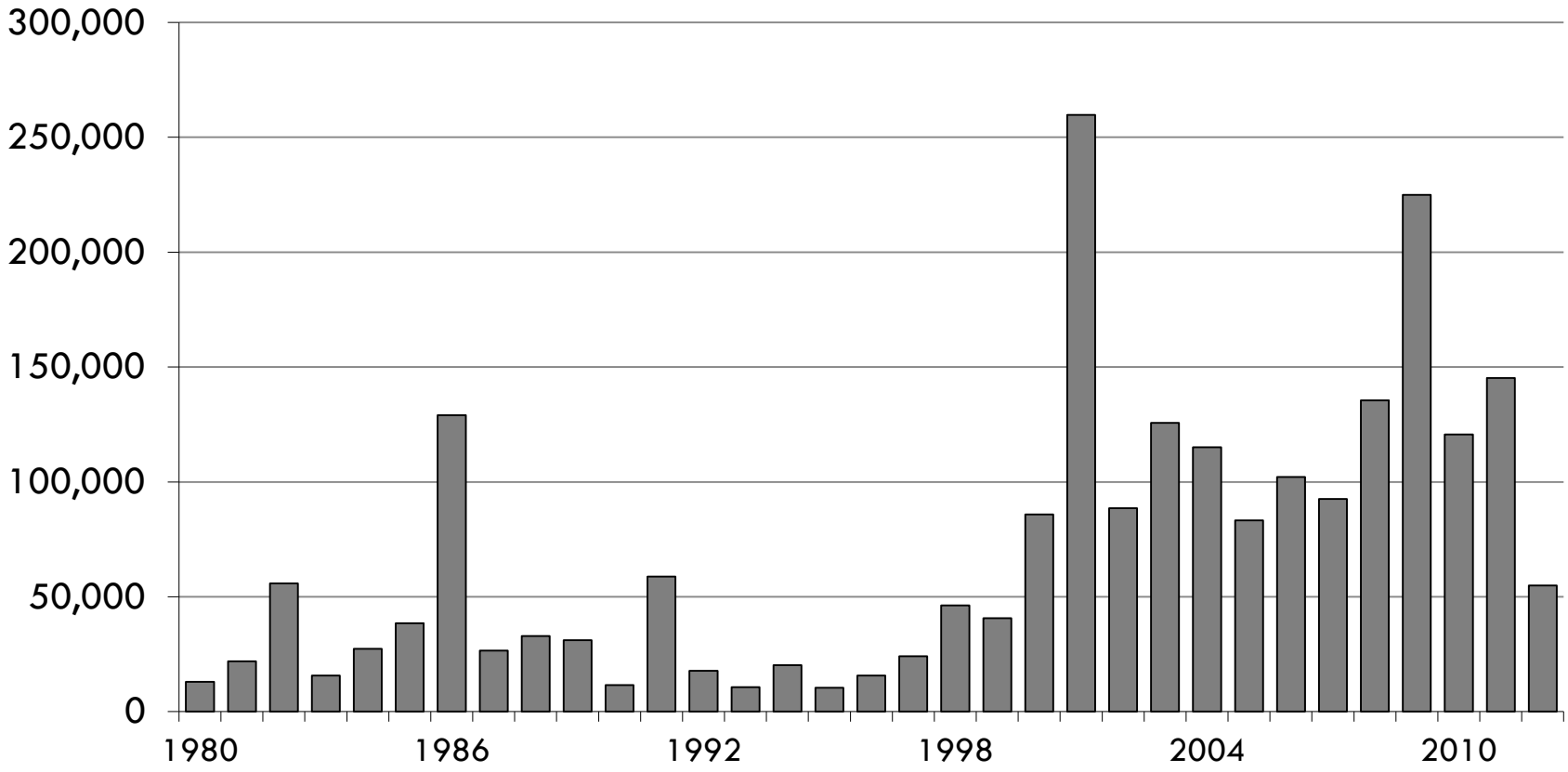
Columbia River Sockeye



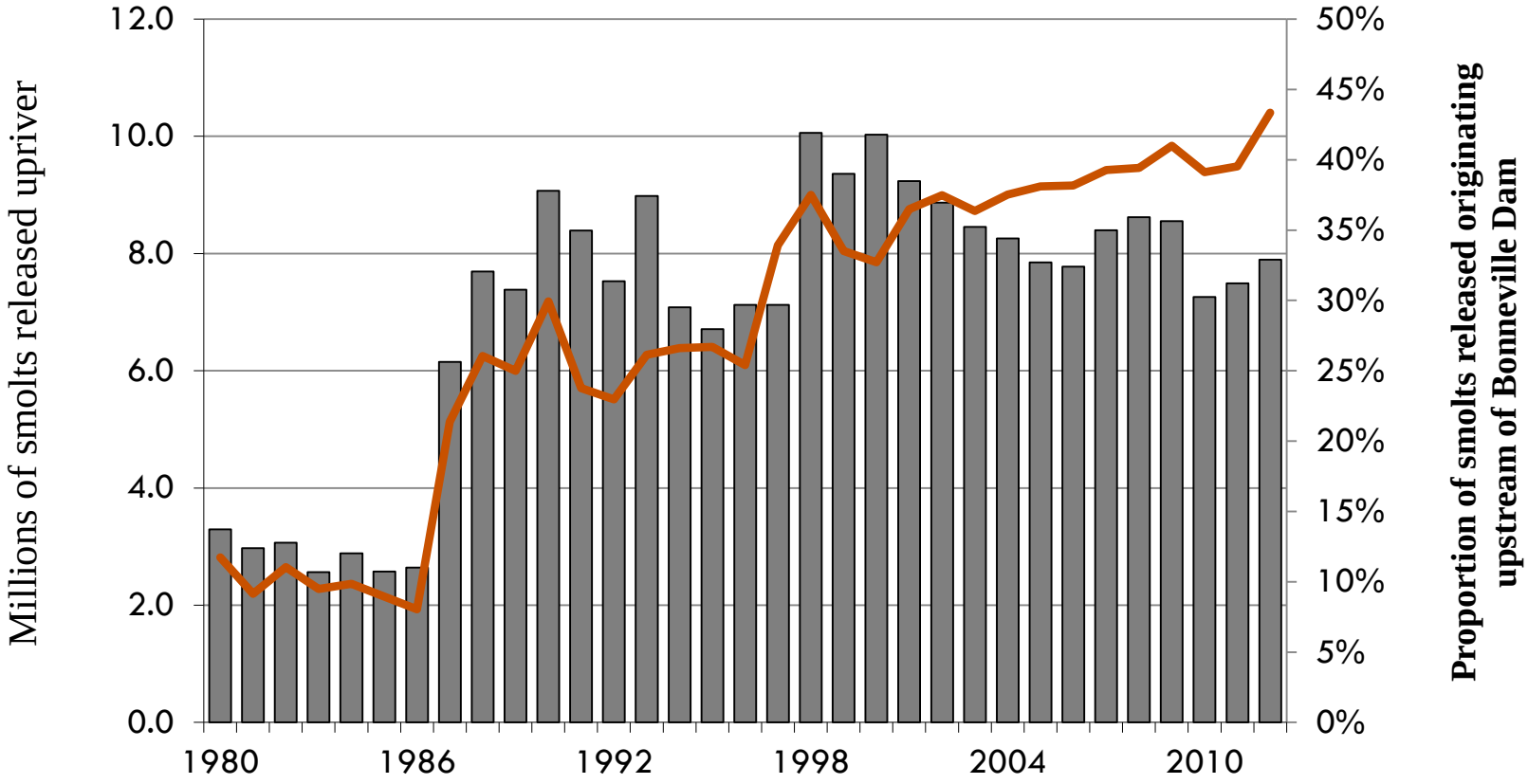
Upriver Summer Steelhead



Upriver Coho at Bonneville Dam



Upriver Coho Smolt Releases



2012 Non-Indian Sport Fisheries

- **Spring Chinook**
  - Below Bonneville: 127,900 angler trips, 16,800 hatchery fish kept
  - Bonneville to WA/OR border: 300 hatchery fish kept
  - Snake River (WA waters): 2,300 hatchery fish kept
- **Summer Season**
  - Below Bonneville: 34,600 angler trips 2,900 hatchery Chinook
    - Record high steelhead and sockeye catch – 14,300 steelhead and 3,900 sockeye kept (May through July/sockeye closed July 1).
  - Above Bonneville: salmonid catch minimal up to Priest Rapids.
    - Sockeye sport catch upstream of Wells Dam reported at 24,000 fish!
- **Fall Season**
  - Buoy 10 – full season: 65,100 angler trips, 18,500 Chin, 7,400 coho
  - Below Bonneville – 130,000 angler trips, 24,000 Chin, 1,000 coho
  - Hanford Reach – 21,000 angler trips, 8,500 Chinook

2012 Non-Indian Commercial Fisheries

- **Spring Chinook** – 6,100 hatchery fish
  - two periods (18hr total)
- **Summer Chinook** – 1,700 Chinook, 400 sockeye
  - one period (8hr)
- **Fall Chinook** – 36,800 fish
  - typical season, LCN tules main constraint
- **Coho** – 2,600 fish
  - One coho-directed period. LCR natural coho main constraint
- **Select Areas:**
  - 10,100 Spring Chinook- similar to past few years
  - 23,700 Fall Chinook - similar to past few years
  - 15,400 Coho – 30% of recent years average harvest

2012 Treaty Indian Fisheries

- Landed fish are either kept for ceremonial and subsistence (C&S) purposes, or sold commercially.
- **Spring Chinook** – 17,700 fish
- **Summer Chinook** – 7,800 fish
- **Sockeye** – 45,400 fish
- **Summer Steelhead** – 16,900 in summer and fall season
- **Fall Chinook** – 92,800
- **Coho** – 7,100

- *2012 data preliminary, harvest may include jacks*

The Snake River Update – Recent trends in salmon and steelhead abundance and outlook on 2013 adult returns

Ed Schriever
Idaho Department of Fish and Game

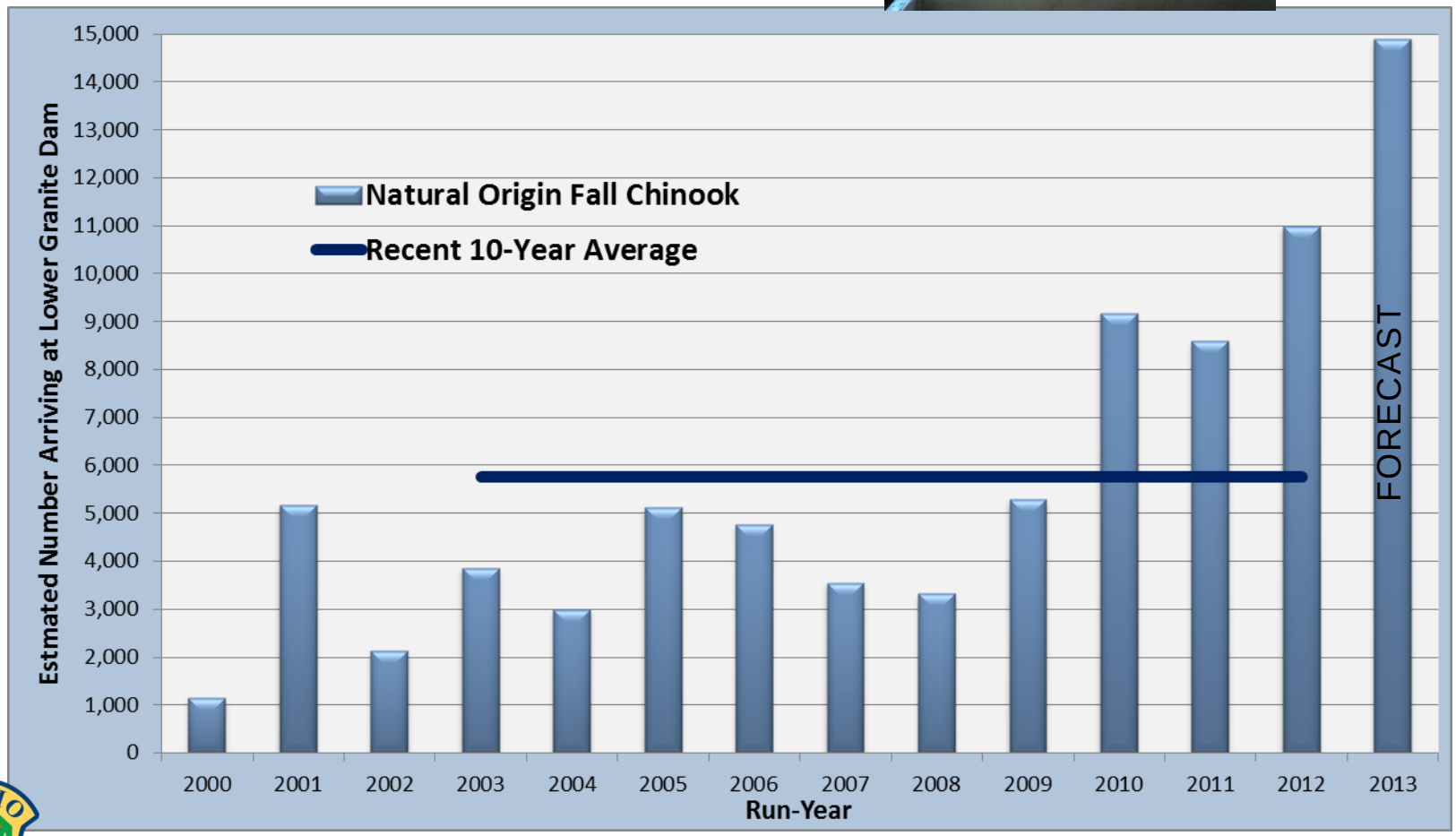
The Snake River Update – Recent trends in salmon and steelhead abundance and outlook on 2013 adult returns

Content:

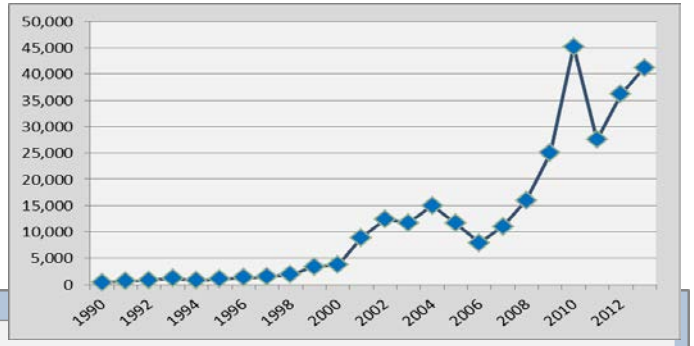
1. 2000-2012 time-series return information:
    a. Fall Chinook Salmon
    b. Sockeye Salmon
    c. Summer Steelhead
    d. Spring/Summer Chinook Salmon

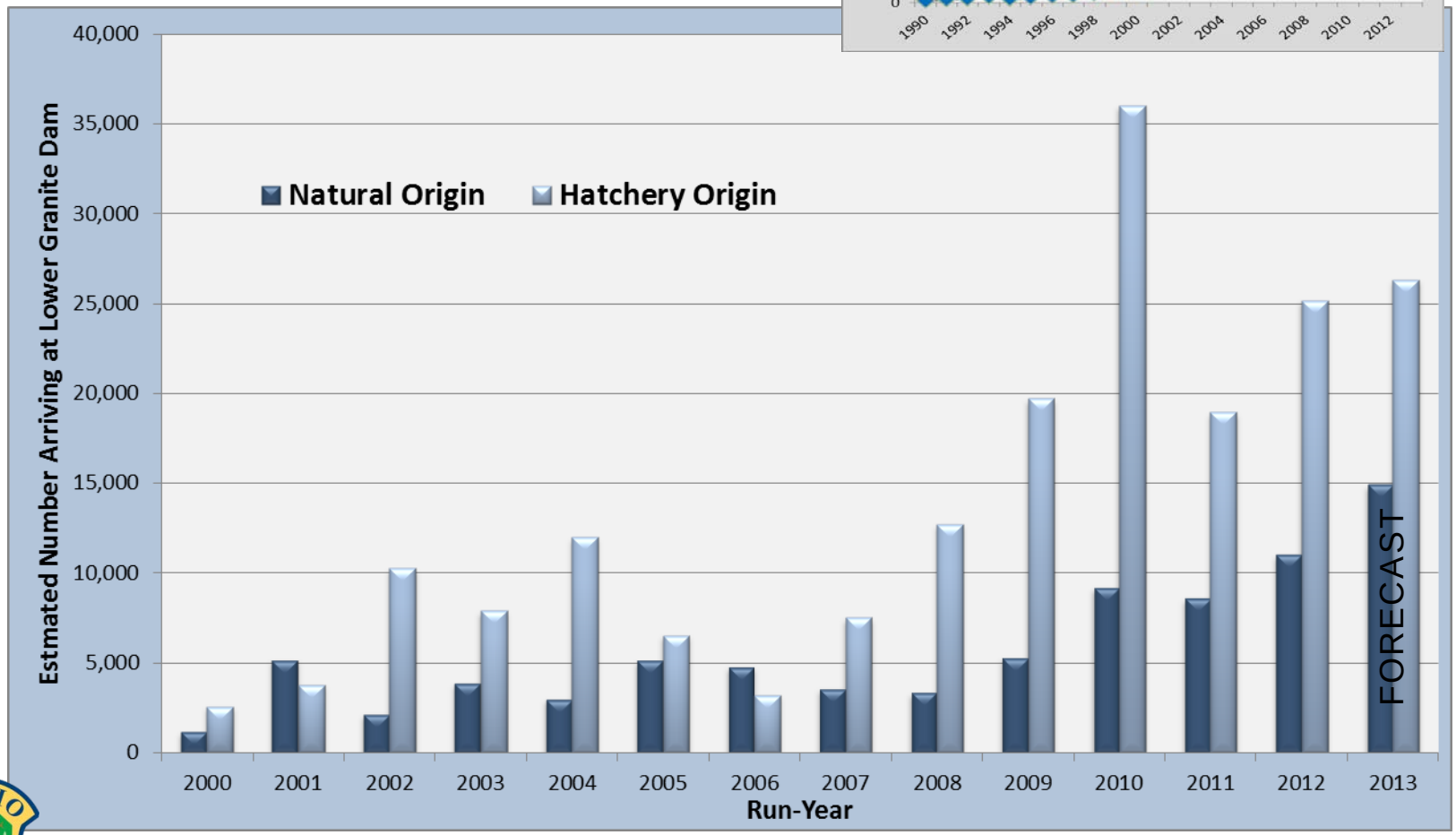
2. 2013 run-size forecasts for:
    a. Fall Chinook Salmon
    b. Sockeye Salmon
    c. Summer Steelhead
    d. Spring/Summer Chinook Salmon

Fall Chinook Salmon

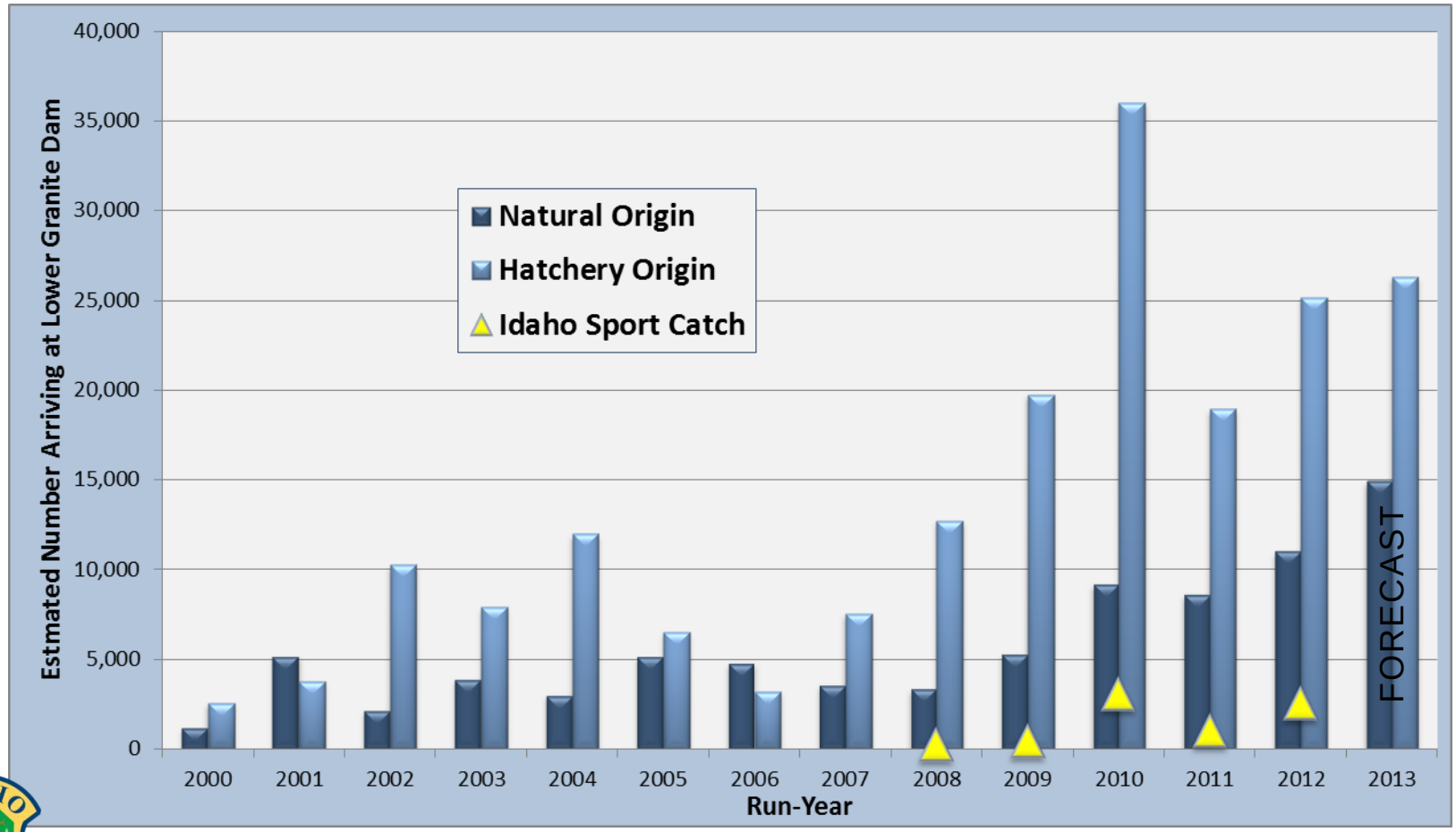


Fall Chinook Salmon

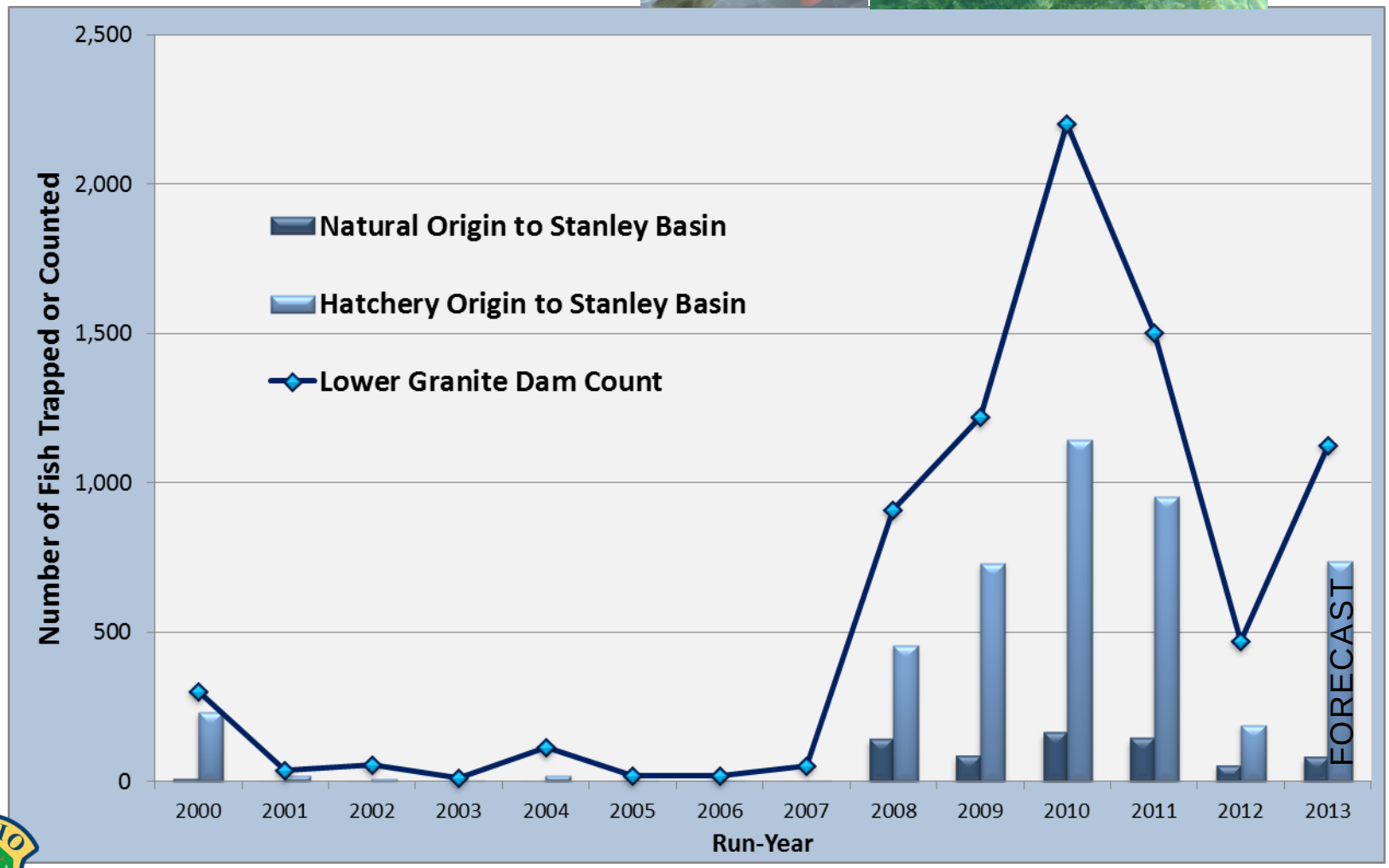




Fall Chinook Salmon



Sockeye Salmon



Summer Steelhead Run-Years

Bonneville Dam

7/1 – 10/31
Group A & B

Steelhead that crossed Bonneville Dam July-October 2012……..

J F M A M J J A S O N D J F M A M J J

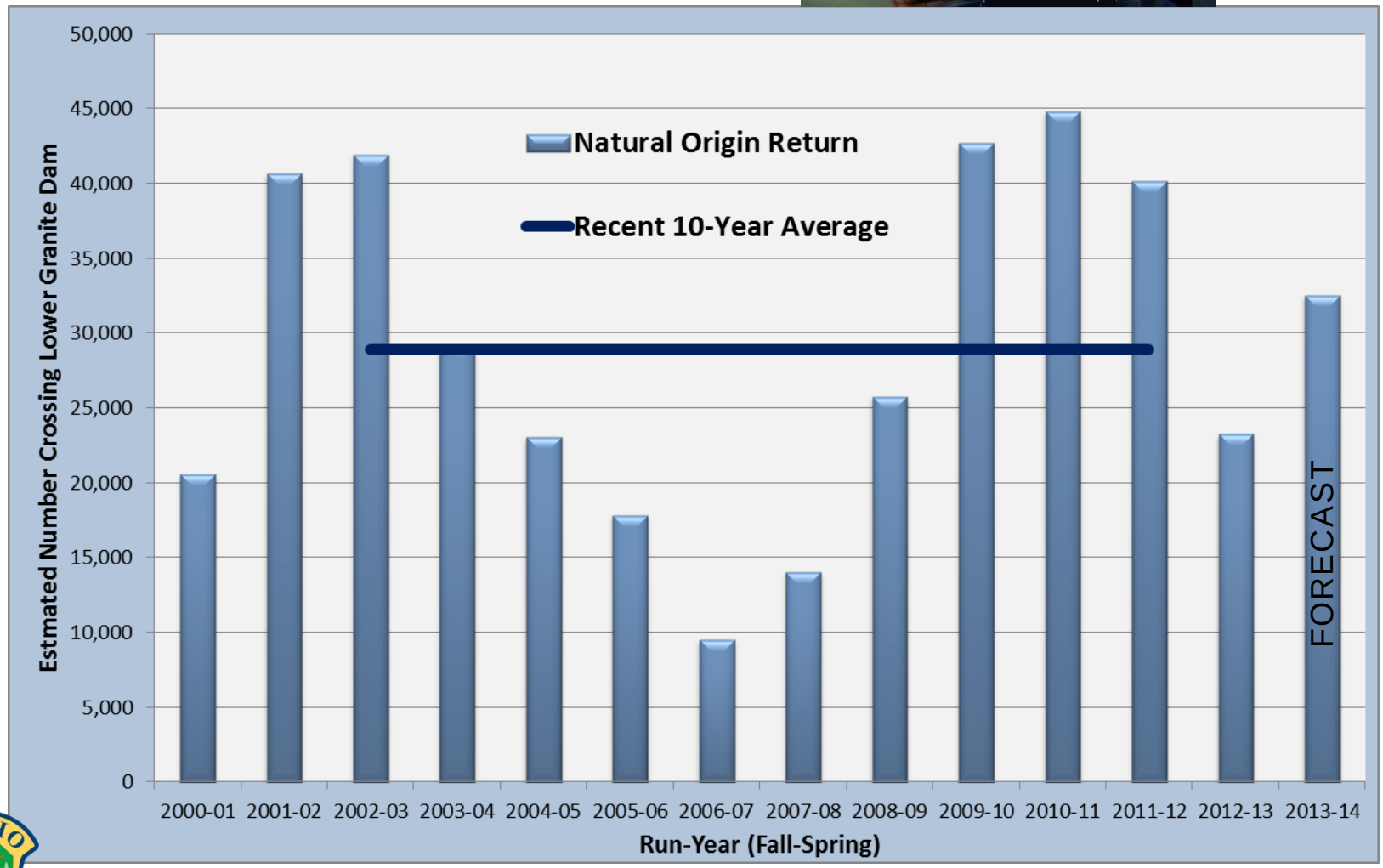
2012 2013

……will cross Lower Granite Dam July 2012 through June 2013.

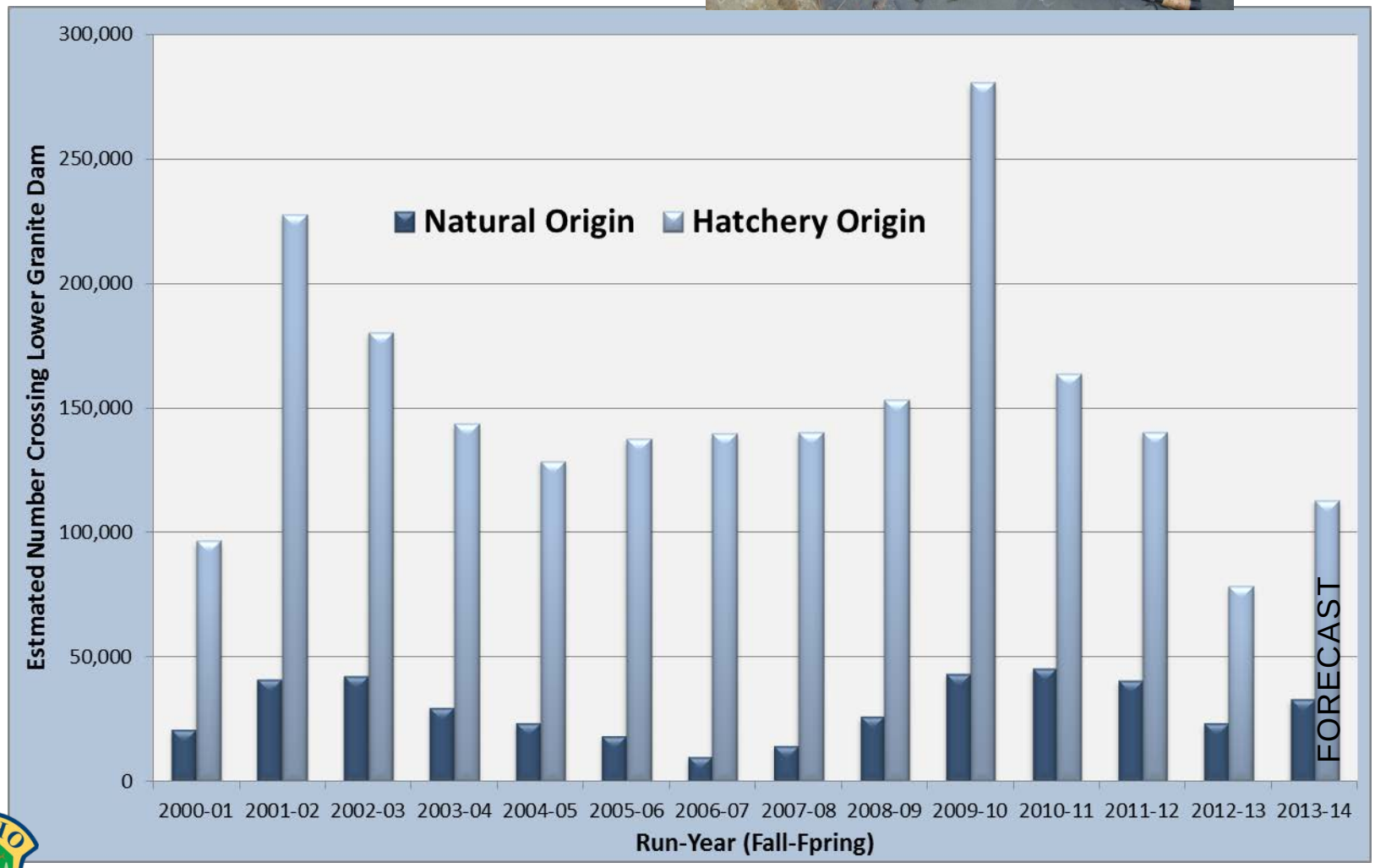
7/1 – 12/31 and 1/1 – 6/30
Group A & B
2012-2013 Run-Year

Lower Granite Dam

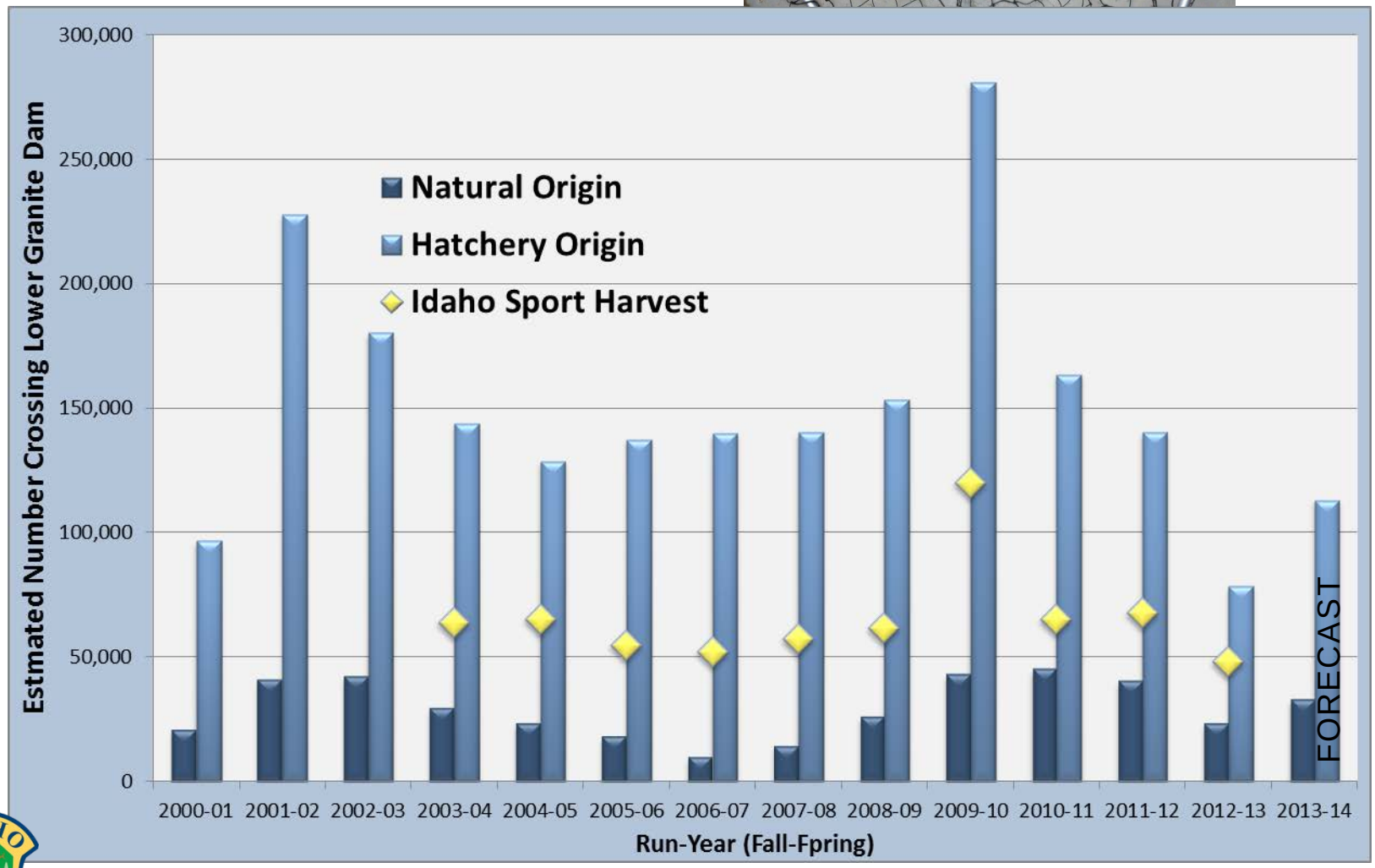
Summer Steelhead



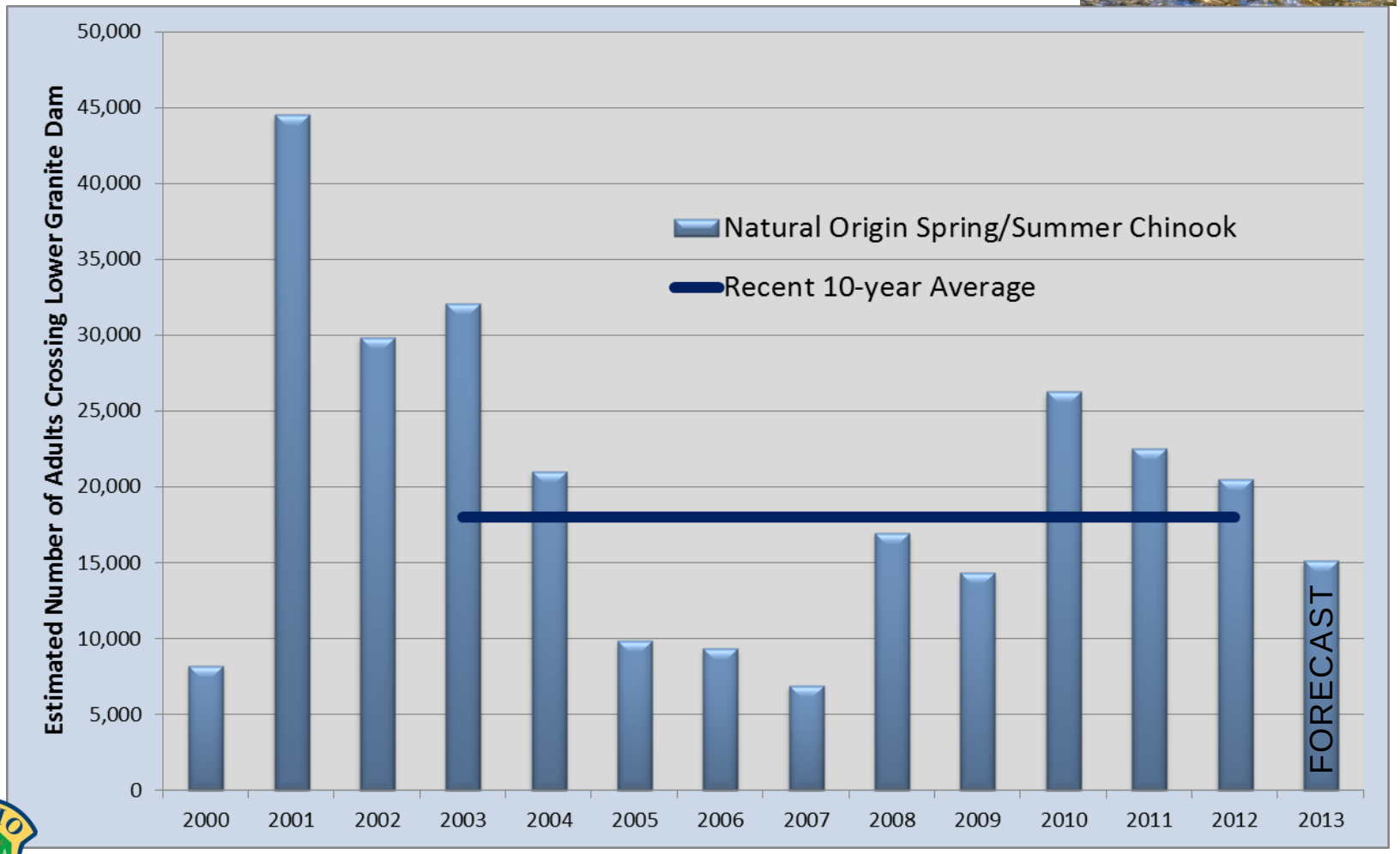
Summer Steelhead



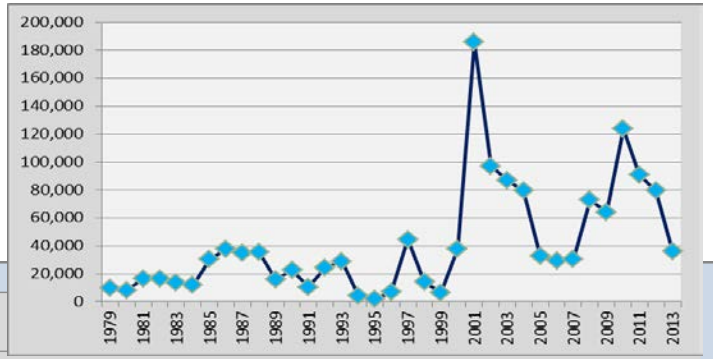
Summer Steelhead

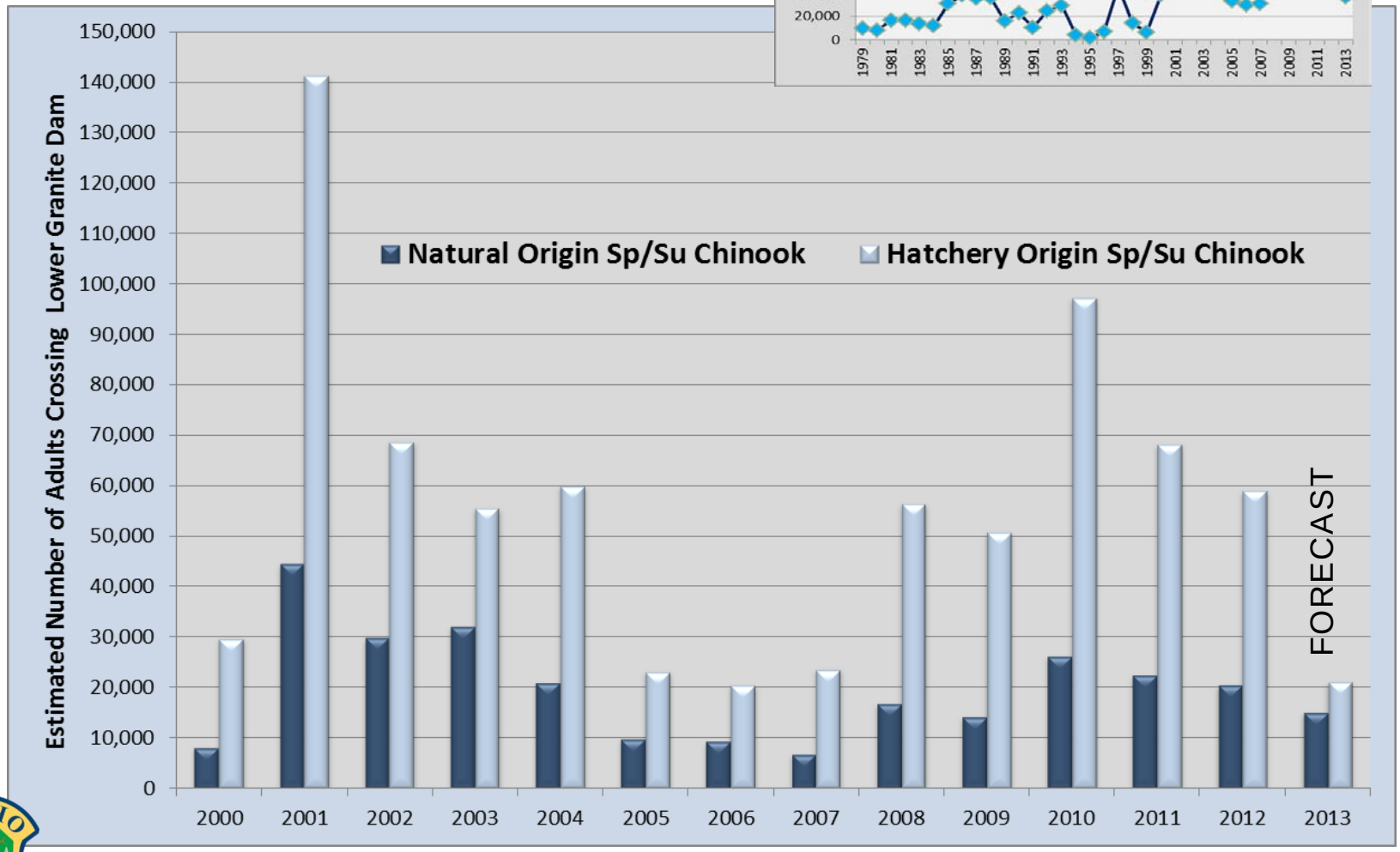


Spring/Summer Chinook Salmon

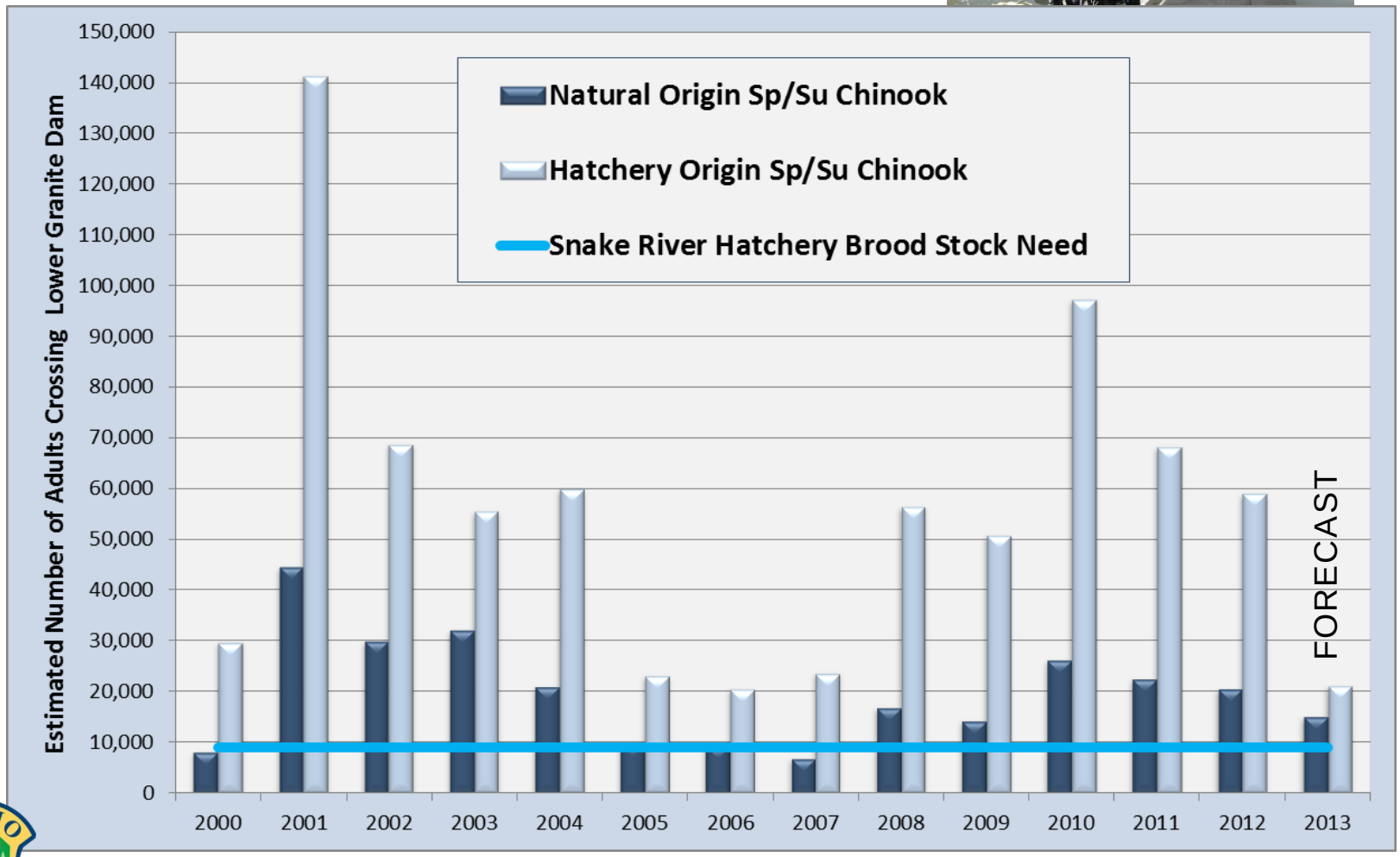


Spring/Summer Chinook Salmon

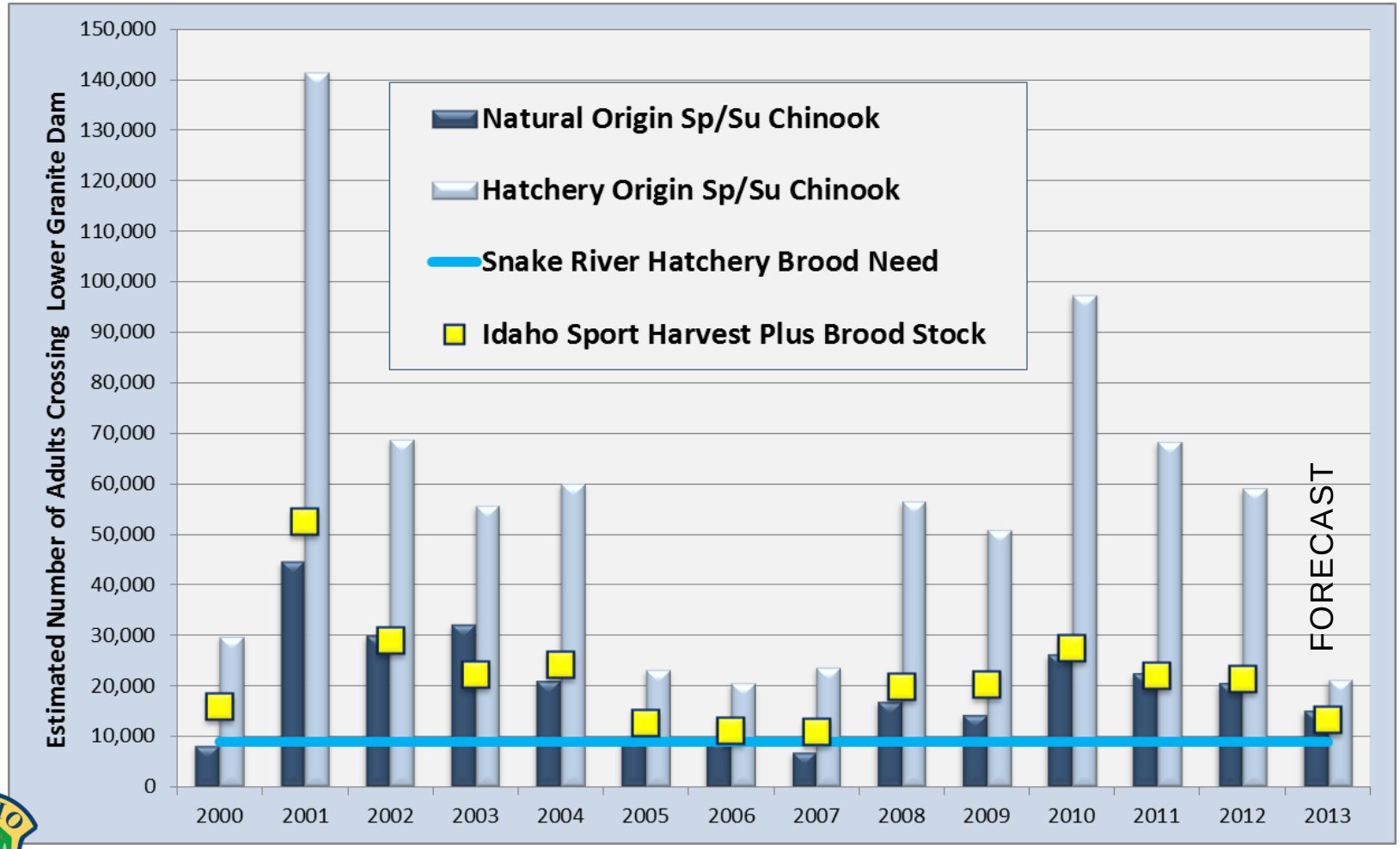




Spring/Summer Chinook Salmon



Spring/Summer Chinook Salmon



Management Processes

Pre-Season	**2012 Estimated Returns** **from monitoring, sampling, run reconstruction** **2013 Forecasted Returns** **prior years' data and modeling**

PROPORTION HATCHERY ORIGIN

PROPORTION WILD ORIGIN

AGE STRUCTURE

OCEAN VARIABLES

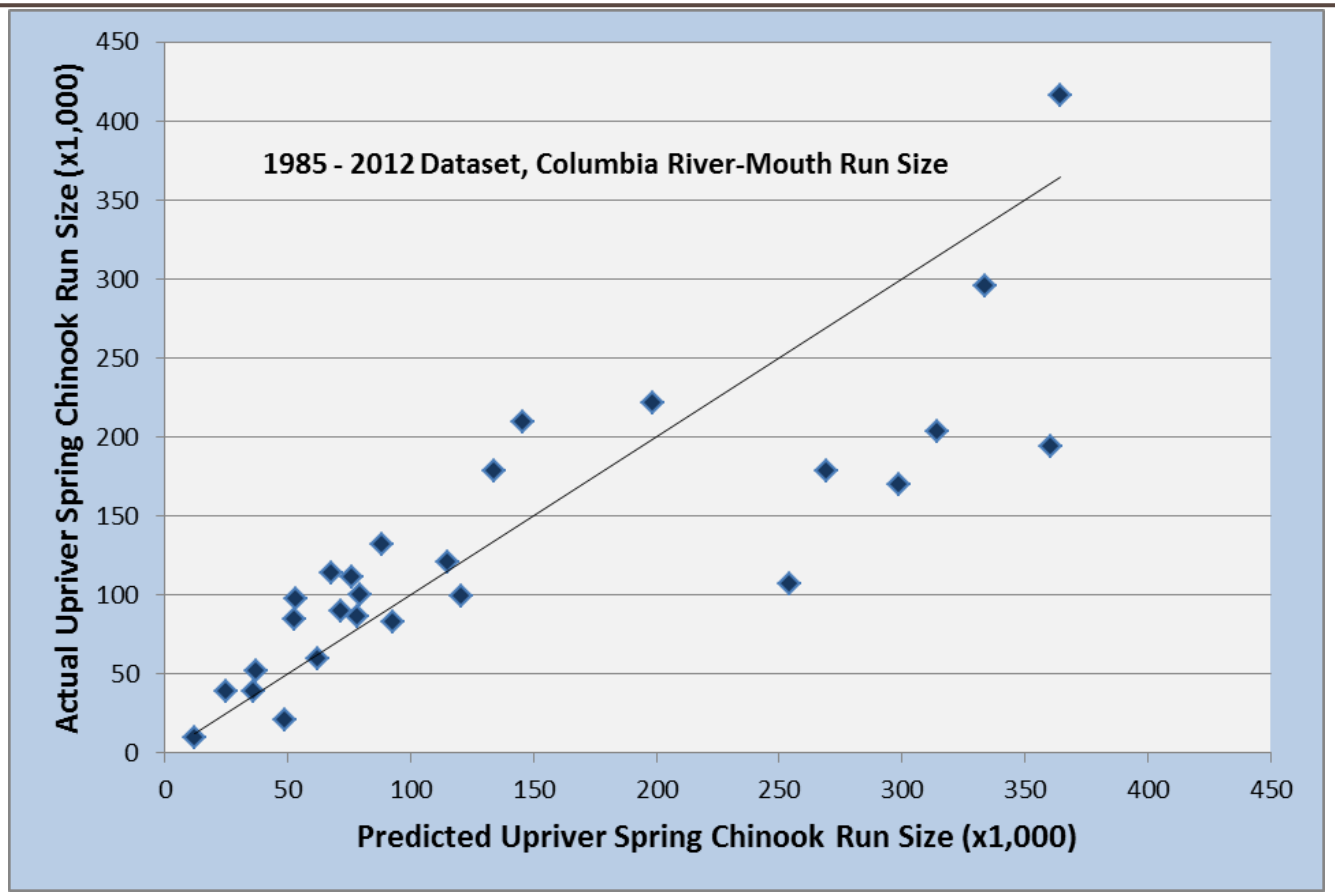
HYDROSYSTEM EXPERIENCE

PREDATORS

NUTRIENTS

Management Processes

Pre-Season	**2012 Estimated Returns** **from monitoring, sampling, run reconstruction** **2013 Forecasted Returns** **prior years' data and modeling**



NOAA's Ocean Project, Ocean Indicators, and Salmon Forecasts

Brian Burke, Kurt Fresh, Bill Peterson, Cheryl Morgan, Kym Jacobson, Jay Peterson, Jennifer Fisher, Bob Emmett, Brian Beckman, Ric Broduer, Antonio Baptista, Jessica Miller, Tom Wainwright, David Teel, Jen Zamon, Ed Casillas, Laurie Weitkamp, Marc Trudel, Elizabeth Daly, Bridget Ferris, Larissa Rohrbach, Cindy Bucher, Marisa Litz, Beth Phillips, Paul Bentley, Susan Hinton, Jim Ruzicka, and others

Northwest Power and Conservation Council Meeting, March 12th, 2013

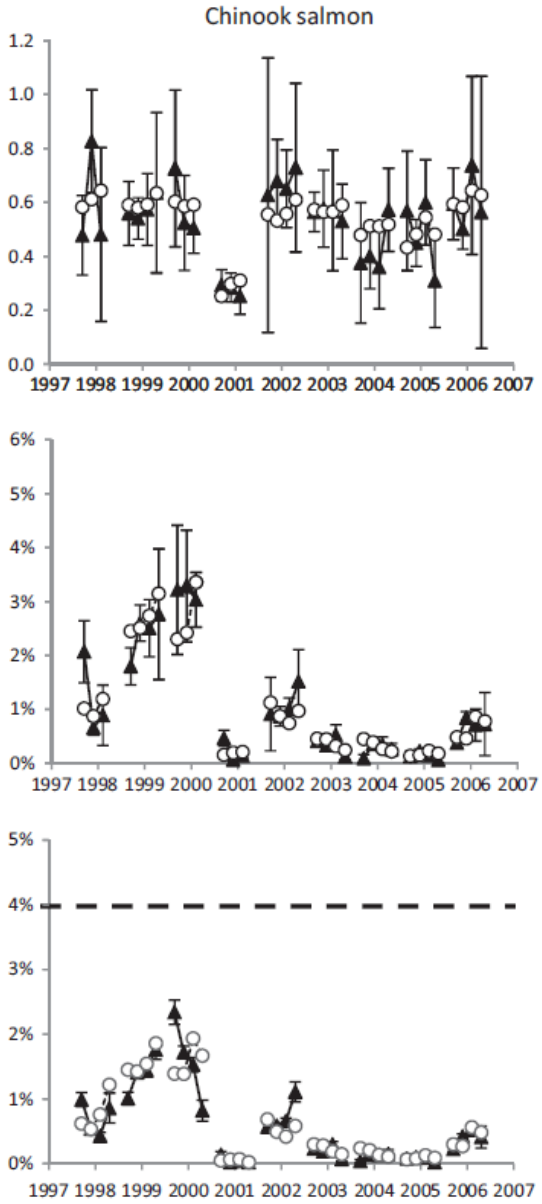
Supported by:

Ocean survival is low and variable

In-river survival (~53%)

Ocean survival (~ 1%)

SAR



Haeseker et al. 2012

The ocean controls variability in salmon survival

Two general (complimentary) approaches to forecasting:

1. Sibling regression
2. Mechanistic models

Ocean Research

Indicators

Models and Analysis

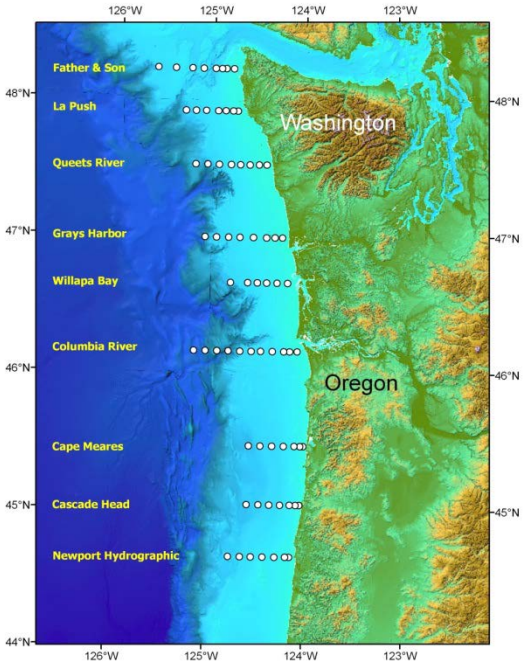
Management Actions

Overview of Research Projects (1998-)

NOAA Trawl Surveys (central Oregon through northern Washington)

Measure physical and biological oceanographic conditions (temp., salinity, plankton, predators)

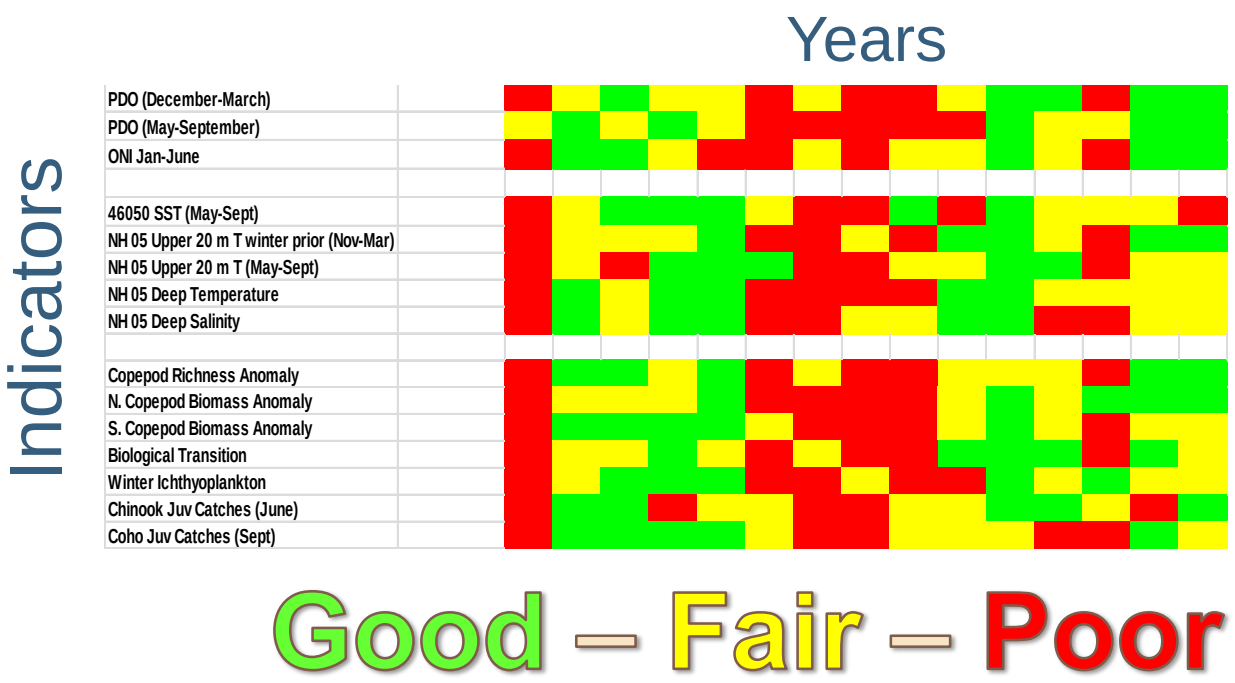
Measure distribution & abundance of juvenile salmonids along with metrics of growth & condition

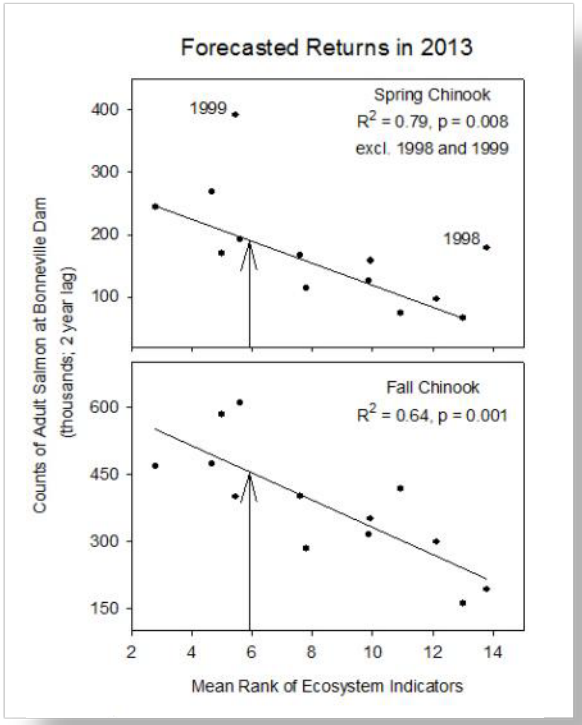


Provide biannual summaries of ocean conditions and salmon forecasts

http://www.nwfsc.noaa.gov/oceanconditions

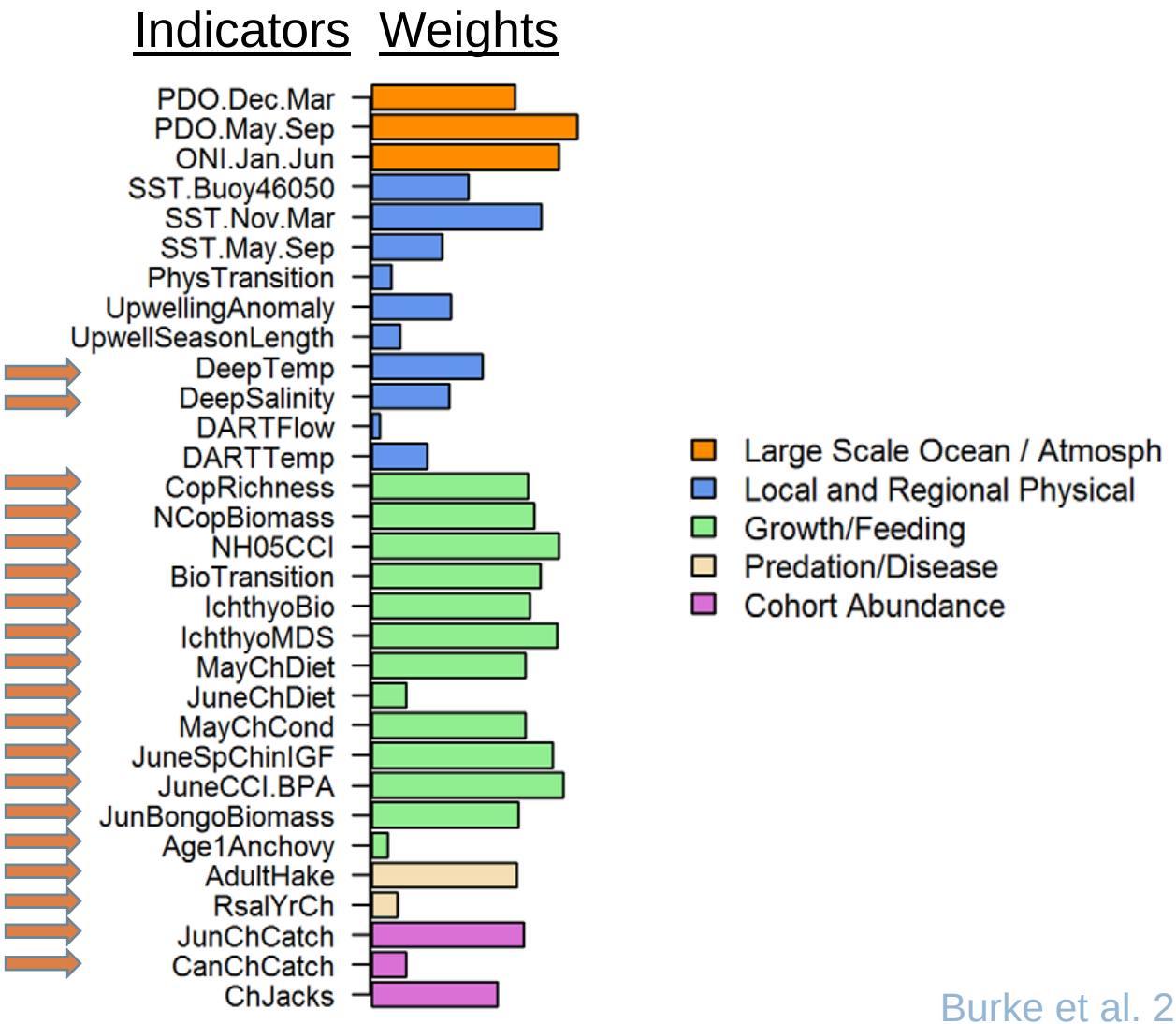
1st Generation Models





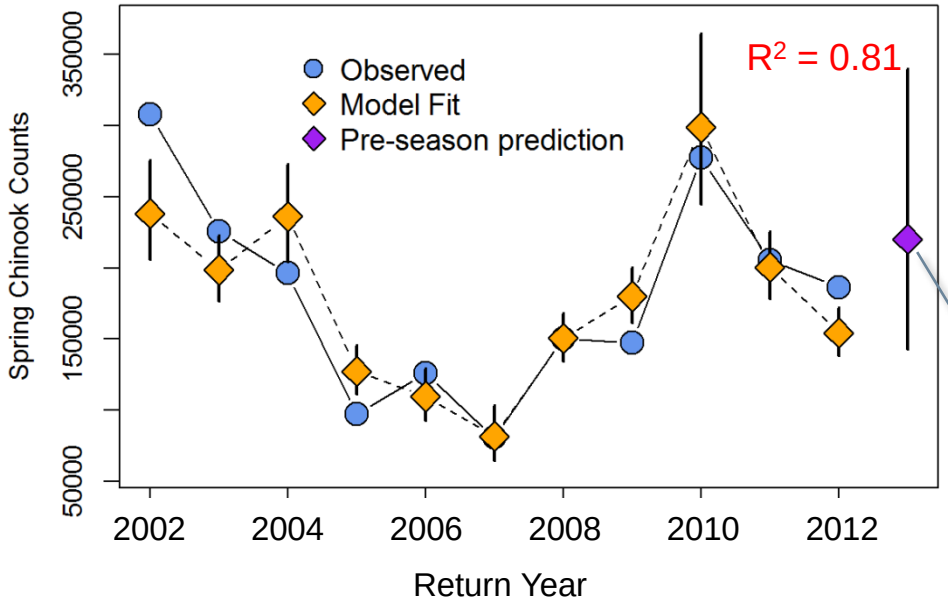
http://www.nwfsc.noaa.gov/oceanconditions

2nd Generation Model



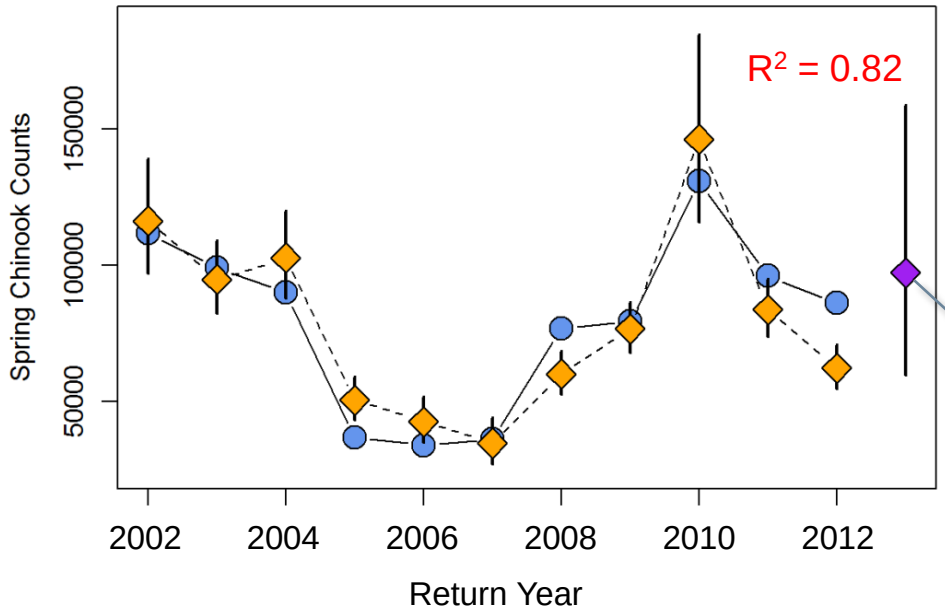
Burke et al. 2013 PLoS ONE

Spring Chinook Salmon



Counts at Bonneville
(plus downstream harvest)

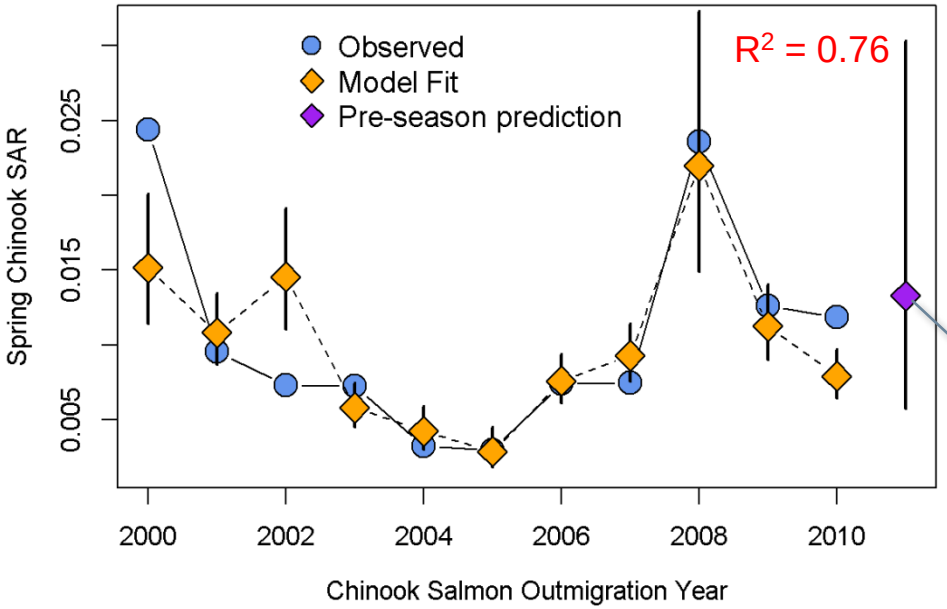
2013: 221,000



Counts at Ice Harbor
(Snake River)

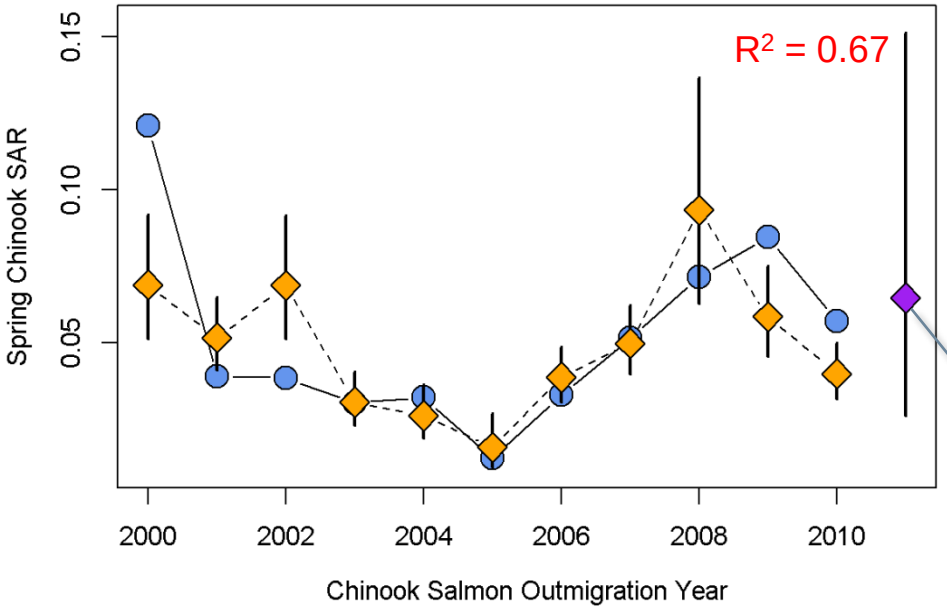
2013: 97,000

Spring Chinook Salmon



Imnaha River
(hatchery fish)

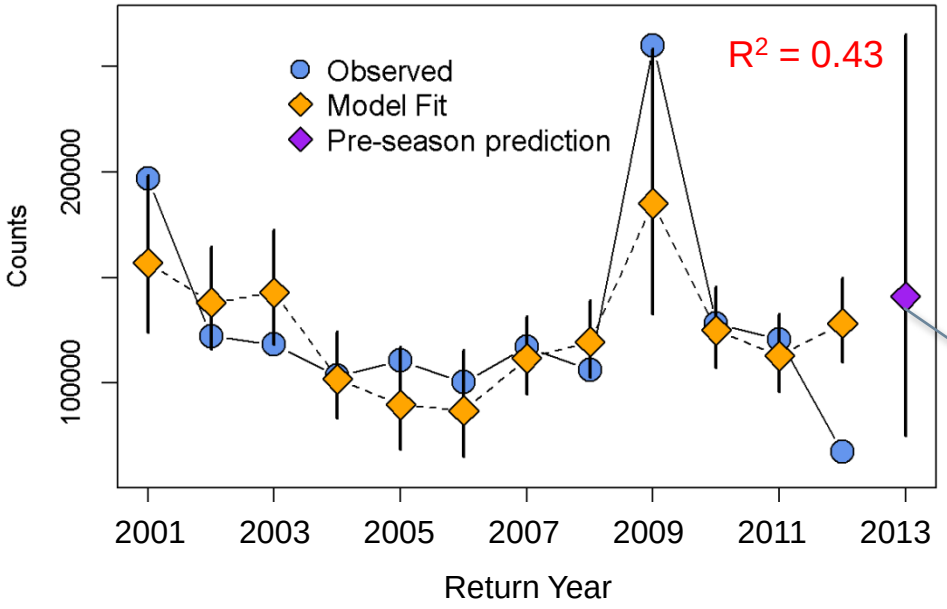
Outmigration 2011: 1.3%



John Day River
(wild fish)

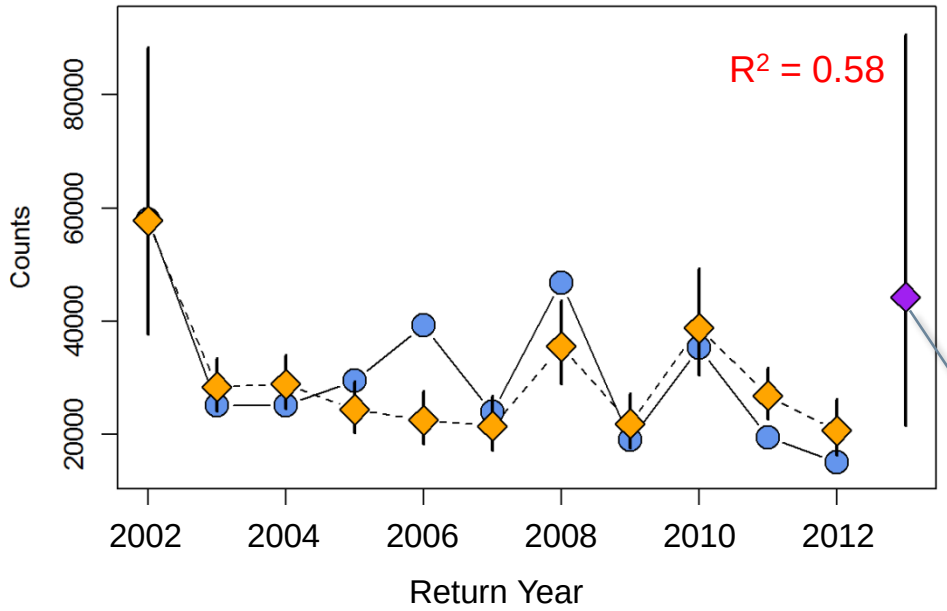
Outmigration 2011: 6.5%

Hatchery Steelhead at Lower Granite Dam



Age 3 Hatchery
(with 1-year lag)

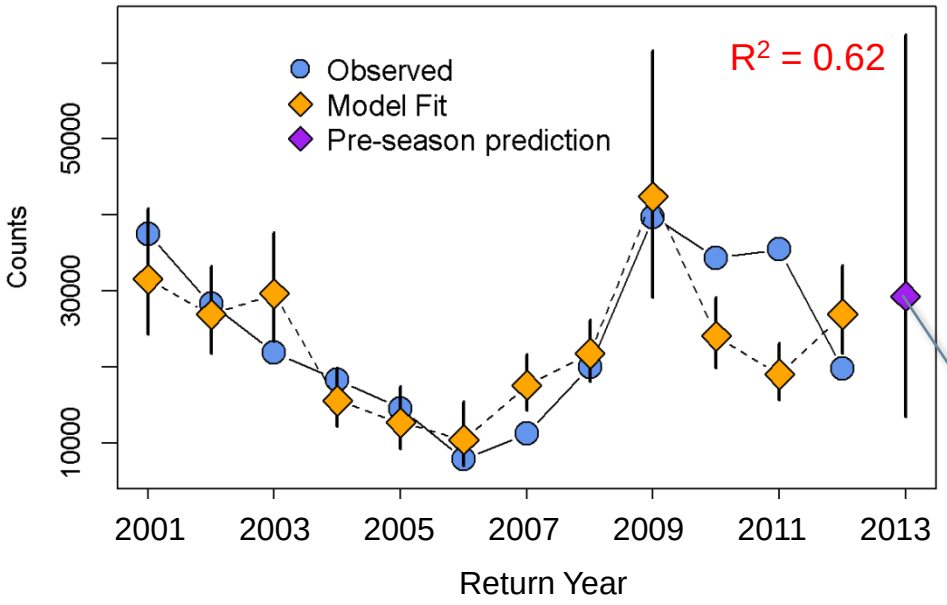
2013: 141,000



Age 4 Hatchery
(with 2-year lag)

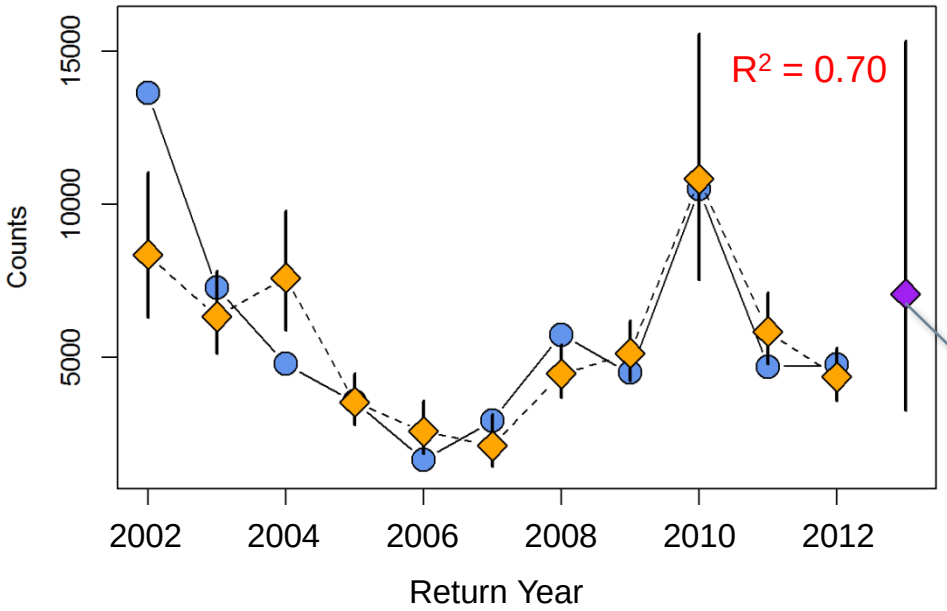
2013: 44,000

Wild Steelhead at Lower Granite Dam



Age 3 Wild Steelhead
(with 1-year lag)

2013: 29,300



Age 4 Wild Steelhead
(with 2-year lag)

2013: 7,100

Summary:

- We can use our understanding of early ocean life and ecology of juvenile salmon to develop accurate forecasts
- 2013 - slightly above average (Chinook and steelhead)

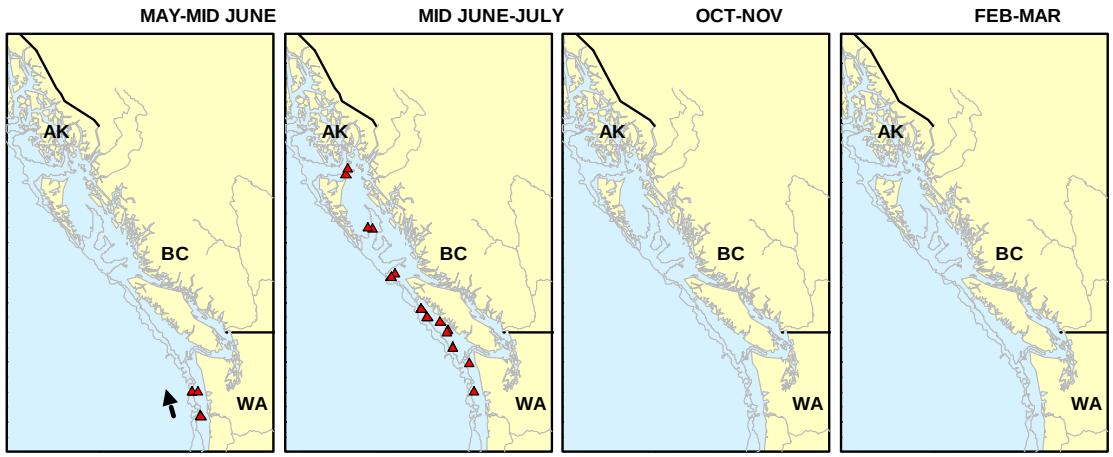
Next steps:

a. Additional dependent variable sets

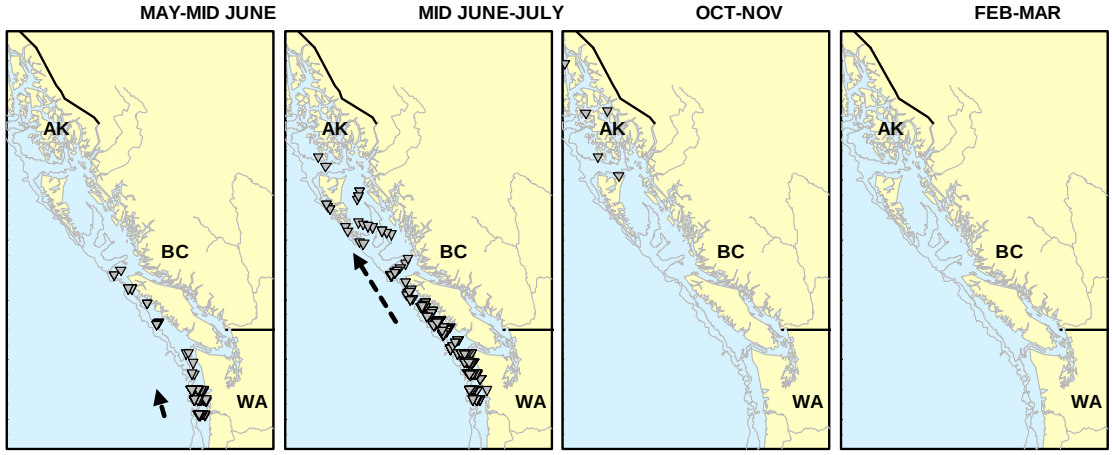
b. Increase stock specificity of forecasts

Columbia River sockeye salmon

Redfish Lake



Wenatchee and Okanogan



- Fisheries and Oceans Canada – funded by BPA

Summary:

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- 2013 - slightly above average (Chinook and steelhead)

Next steps:

a. Additional dependent variable sets

b. Increase stock specificity of forecasts

c. Next generation of models

d. Other applications of forecasts - life cycle modeling

Questions?