

# Salmon Outlook for 2009

Nov 22, 2008



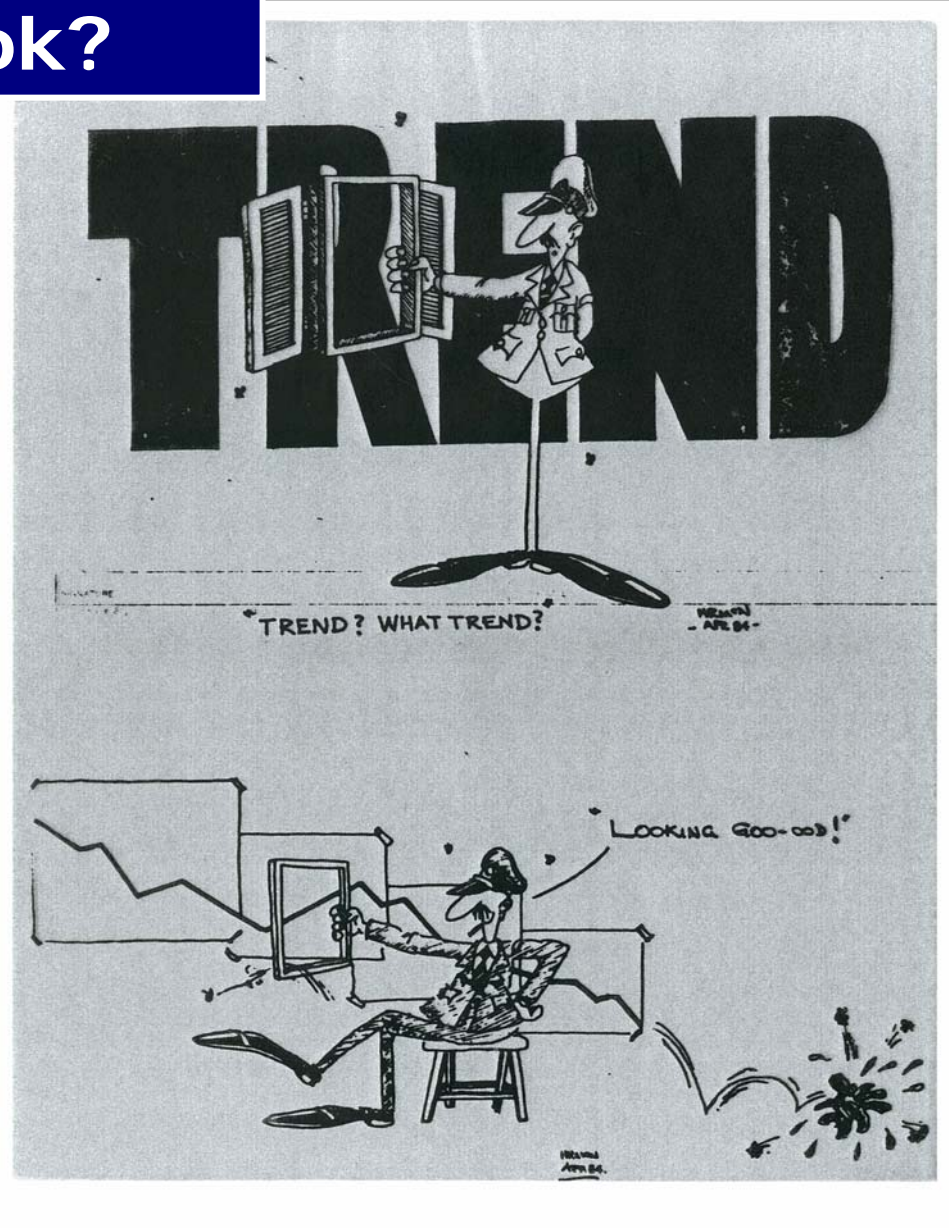
Prepared by *Regional Salmon  
Stock Assessment*

- Pacific Biological Station, B Riddell
- South Coast StAD
- Fraser River StAD
- North Coast StAd
- Yukon/Trans-Boundary StAD;

*& Institute of Ocean Science*

# What is the Outlook?

- Preliminary forecast of status (version 1)
- Categorical, not quantitative
- Status and targets are based on a variety of approaches including expert opinion.



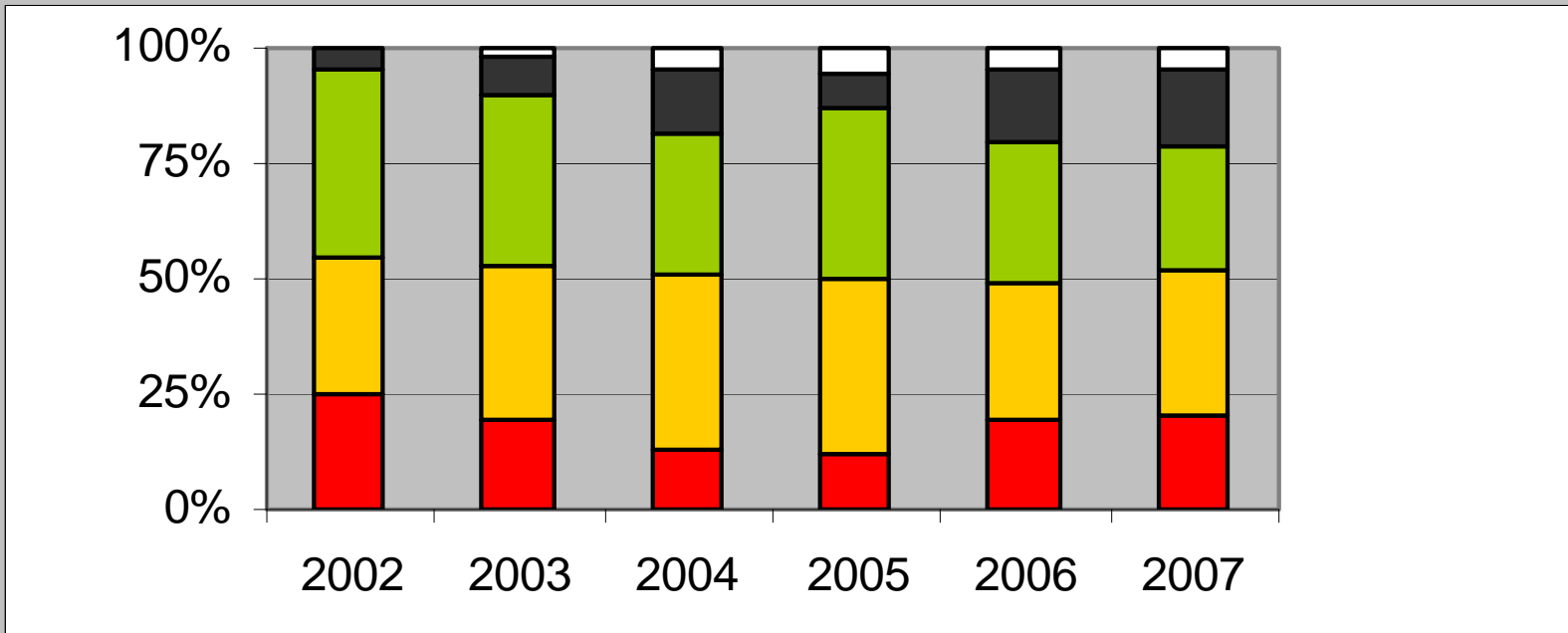
Criteria applied to individual "Stock Groups" ... more equivalent to management groups (n = 93) than WSP Conservation Units (n > 400 CU's).

<i>Category</i>	<i>Abundance</i>	<i>Trend</i>
1. Stock of concern	<25% target	Declining rapidly
2. Low	25% to 75% of target	Declining
3. Near Target	75% to 125% of target	Stable
4. Abundant	>125% of target	N/A

- Objective & consistent context for fisheries planning.
- From biological perspective, gives indication of fishing opportunities and stocks around which fisheries may be shaped.
- Is a prelude to PSARC forecasts and formal advice.
- **No Steelhead populations included.**

# Past Outlook Status Assessments

The yearly salmon stock Outlooks are illustrated by category back to 2002. Based on 93 geographic "stock groups" as in past years.



Future salmon outlooks will be increasingly harmonized with WSP conservation units and biological status zones (red, amber, green)

# *2009 Outlook compared to 2007 & 2008 Outlooks*

## **2007**

- 40 stock groups  $\geq$  target
- 18 stock groups of some conservation concerns
- 31 stock groups with mixed categories due to multiple populations within the group
- 4 stock groups Not Assessed

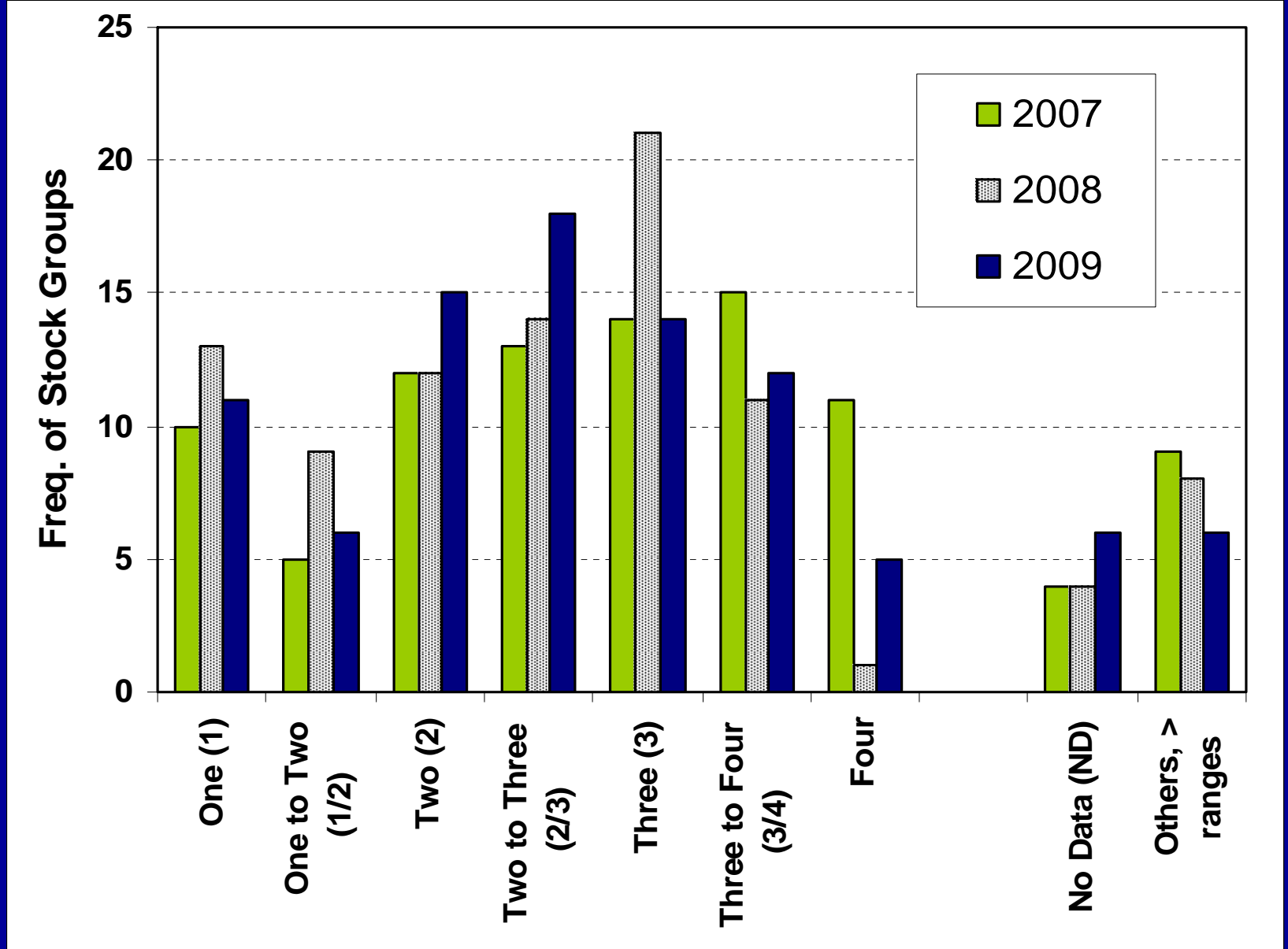
## **2008**

- 34 stock groups  $\geq$  target
- 34 stock groups of some conservation concerns
- 21 stock groups with mixed categories due to multiple populations within the group
- 4 stock groups Not Assessed

## **2009**

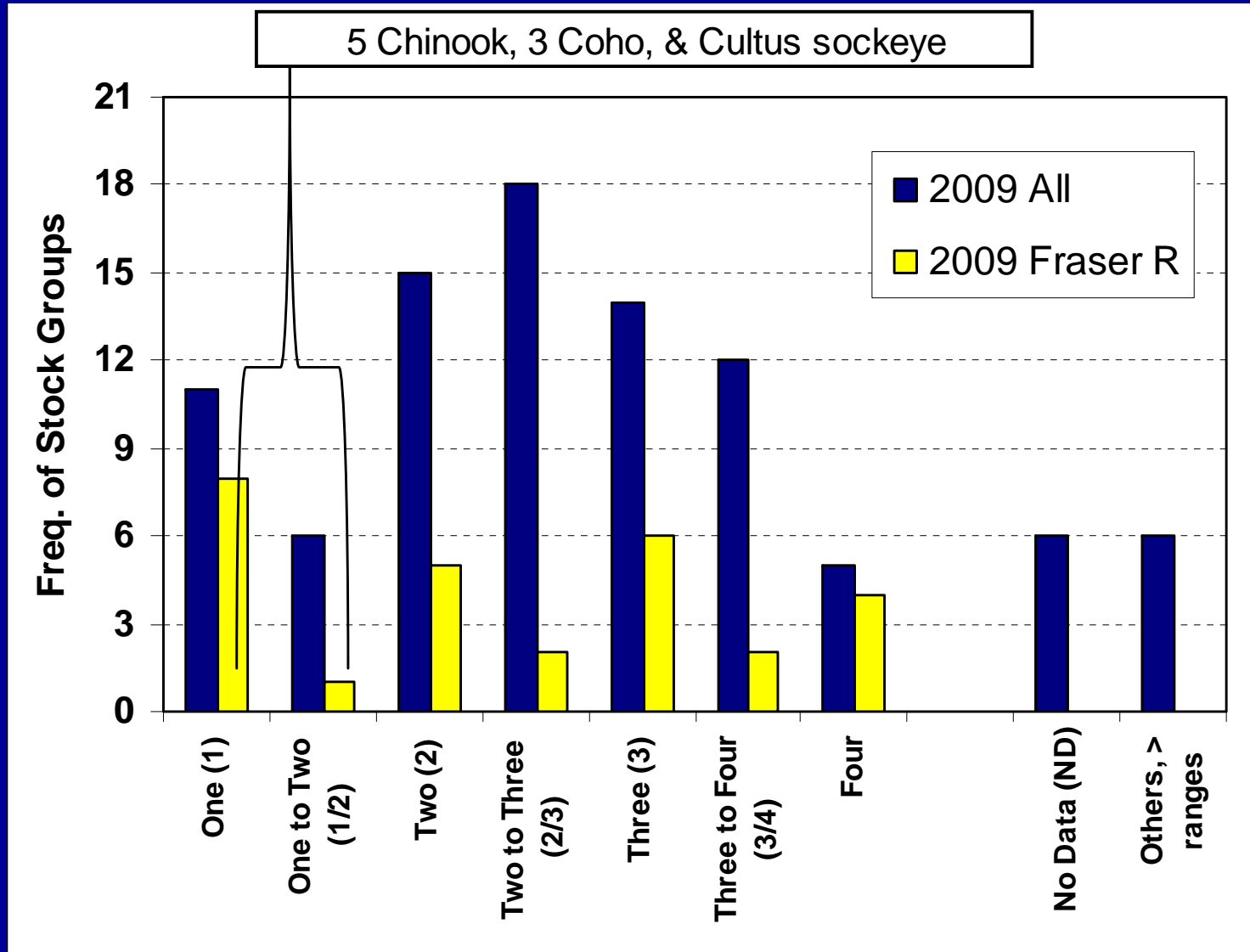
- 31 stock groups  $\geq$  target (- 2 groups to ND)
- 32 stock groups of some conservation concerns
- 24 stock groups with mixed categories due to multiple populations within the group
- 6 stock groups Not Assessed

# Comparison of Recent Outlooks ...



# Influence of Fraser River stock groups on overall Outlook

... 28 of 93 (30%) groups are in the Fraser River.



## 2005 Sea-Entry Year ... extremely poor salmon survivals

2006 returns of Pink salmon poor coast wide thru to Central Alaska (0.25 to 0.33 of expected return), **2008 returns also poor.**

2006 returns of Coho salmon in Southern BC amongst poorest recorded (worst since 1975 in BCI) ... (*2008 still in assessment*)

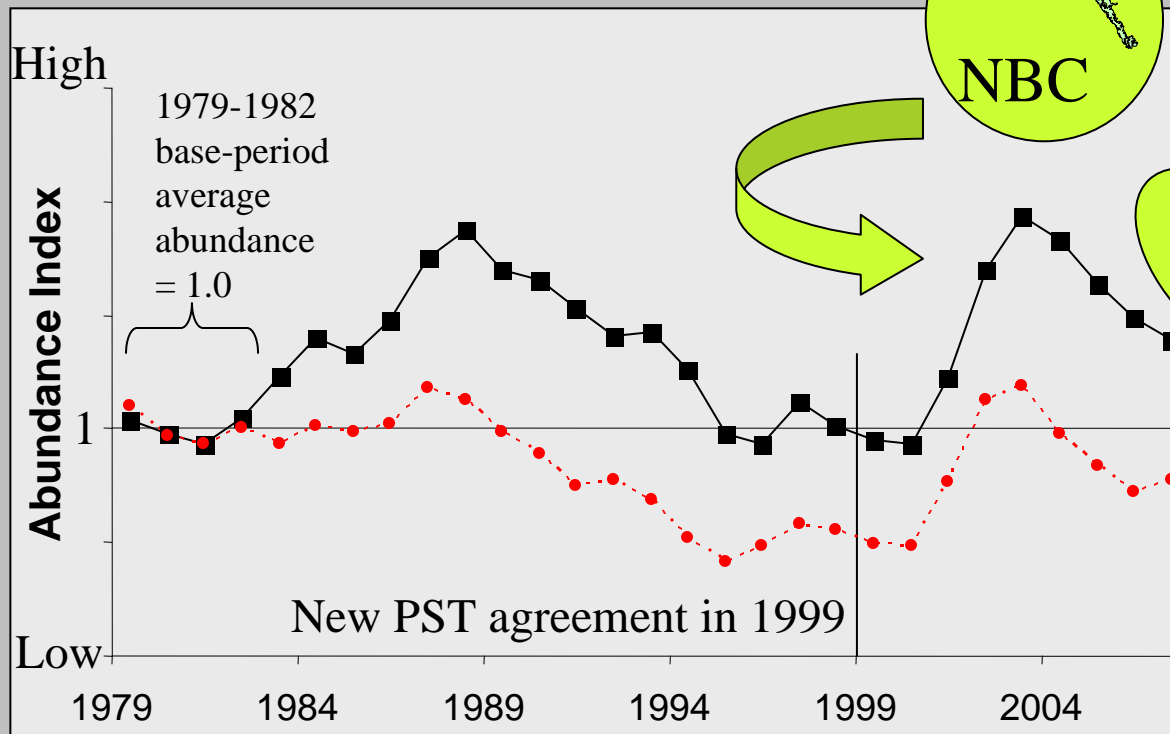
2007 & 2008 returns of sockeye salmon wide spread reductions (much poorer than forecast) in Barkley Sound and Fraser River, but Skeena River better than expected in 2008 (very poor jacks in 2008)

2007 returns of Chinook salmon failure of 4<sub>2</sub> age-class, significant in WCVI stocks, Cowichan River, Interior Fraser spring and summer Chinooks (Age-5s in 2008). 2008 similar to 2007 runs.

2007 & 2008 Southern BC chum returns no notable failure

# Chinook AABM Fishery Abundance Indices

- 2008 Pre-season expectations for significant reduction in NBC (0.96 ABI) and WCVI (0.76 ABI)
- 2007 Post-season values 1.10 NBC and 0.57 WCVI



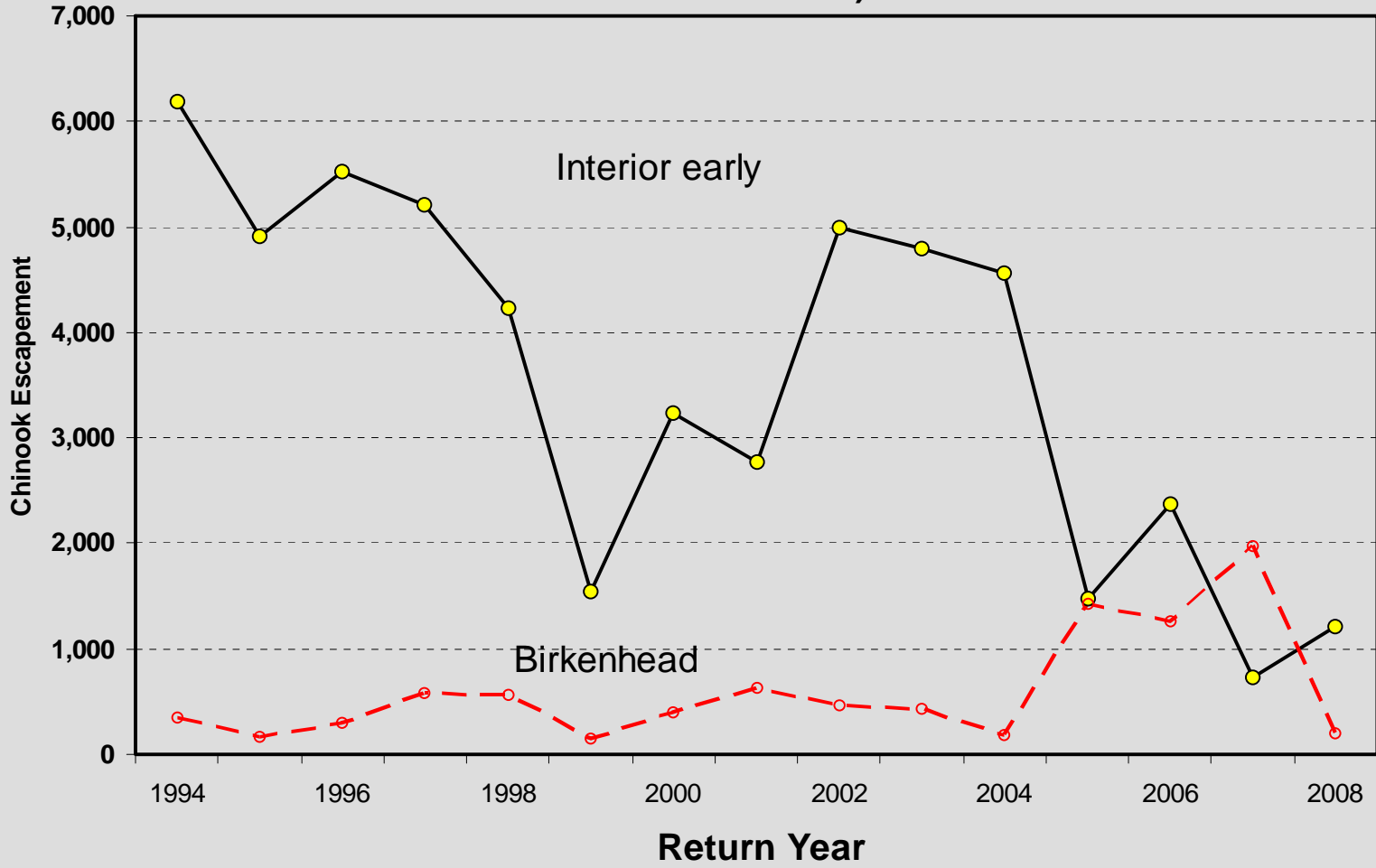
**2008  
Significant  
reductions in  
AI for NBC  
but less so for  
WCVI**



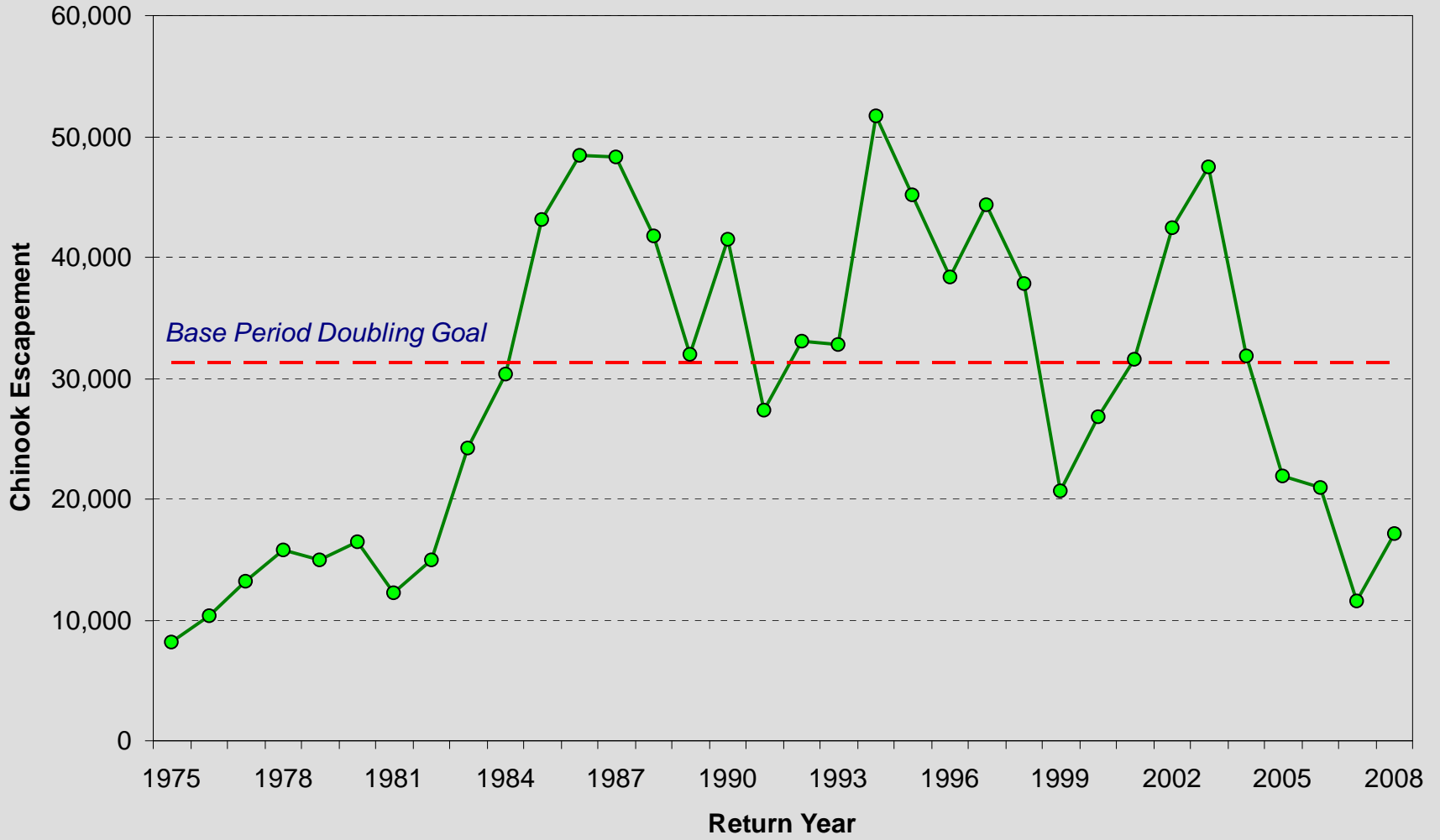
# Fraser River Chinook review

# Fraser Early Spring, 1994-2008

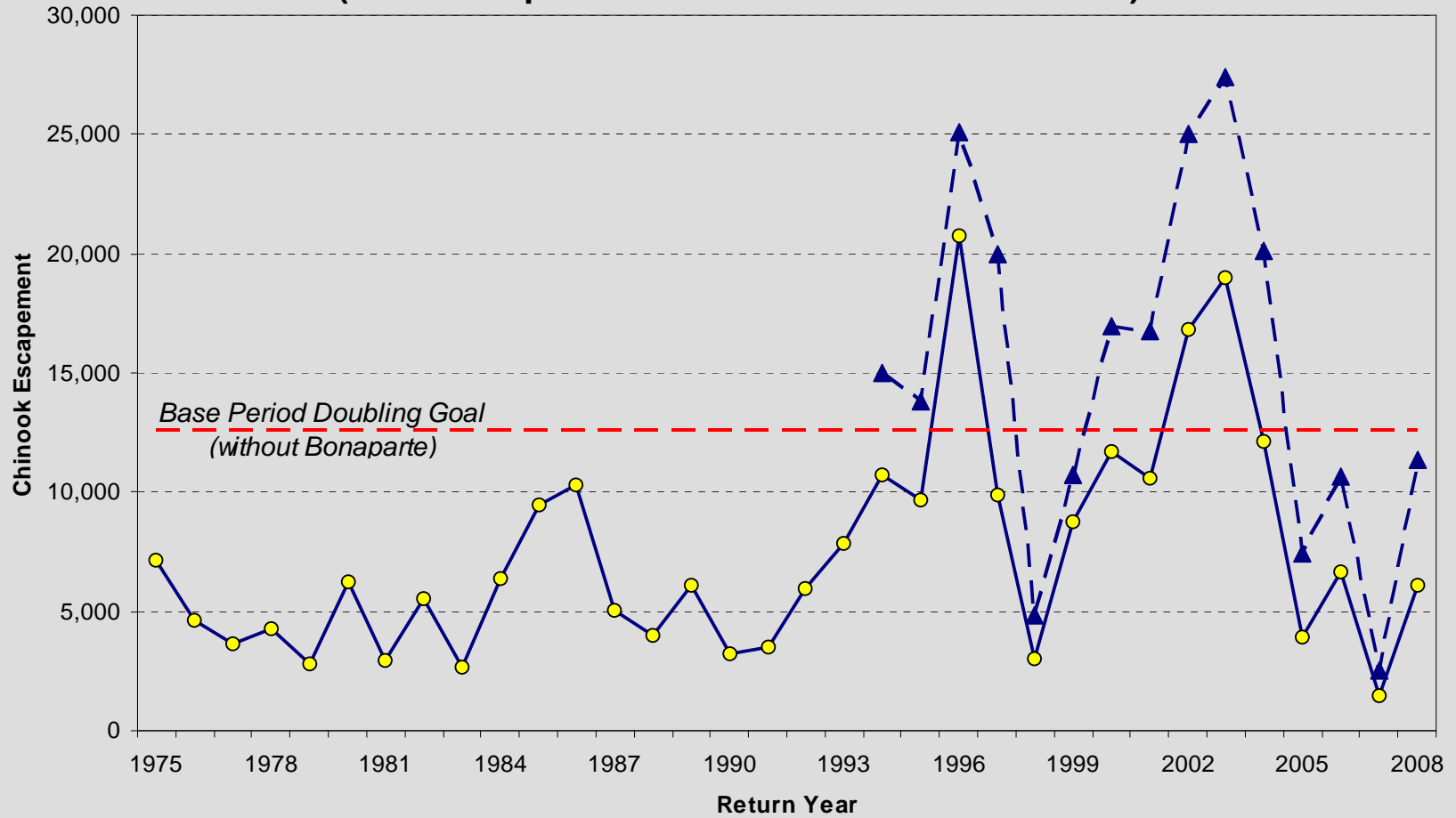
(Spius, Coldwater, Louis, Upper Chilcotin, Cottonwood, Chilako, and Birkenhead)



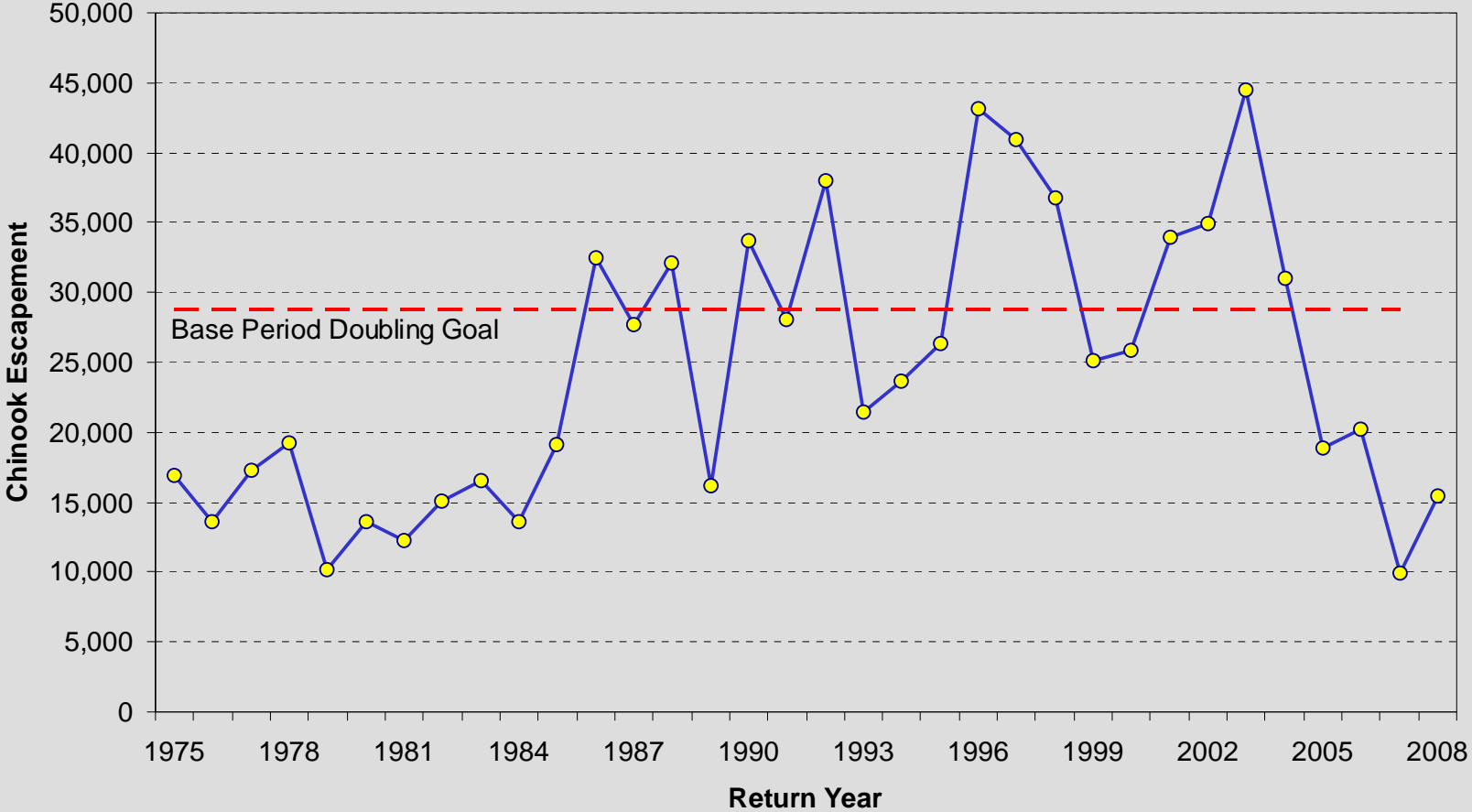
# Fraser Spring - 5<sub>2</sub> stocks (CTC Indicator Stocks)



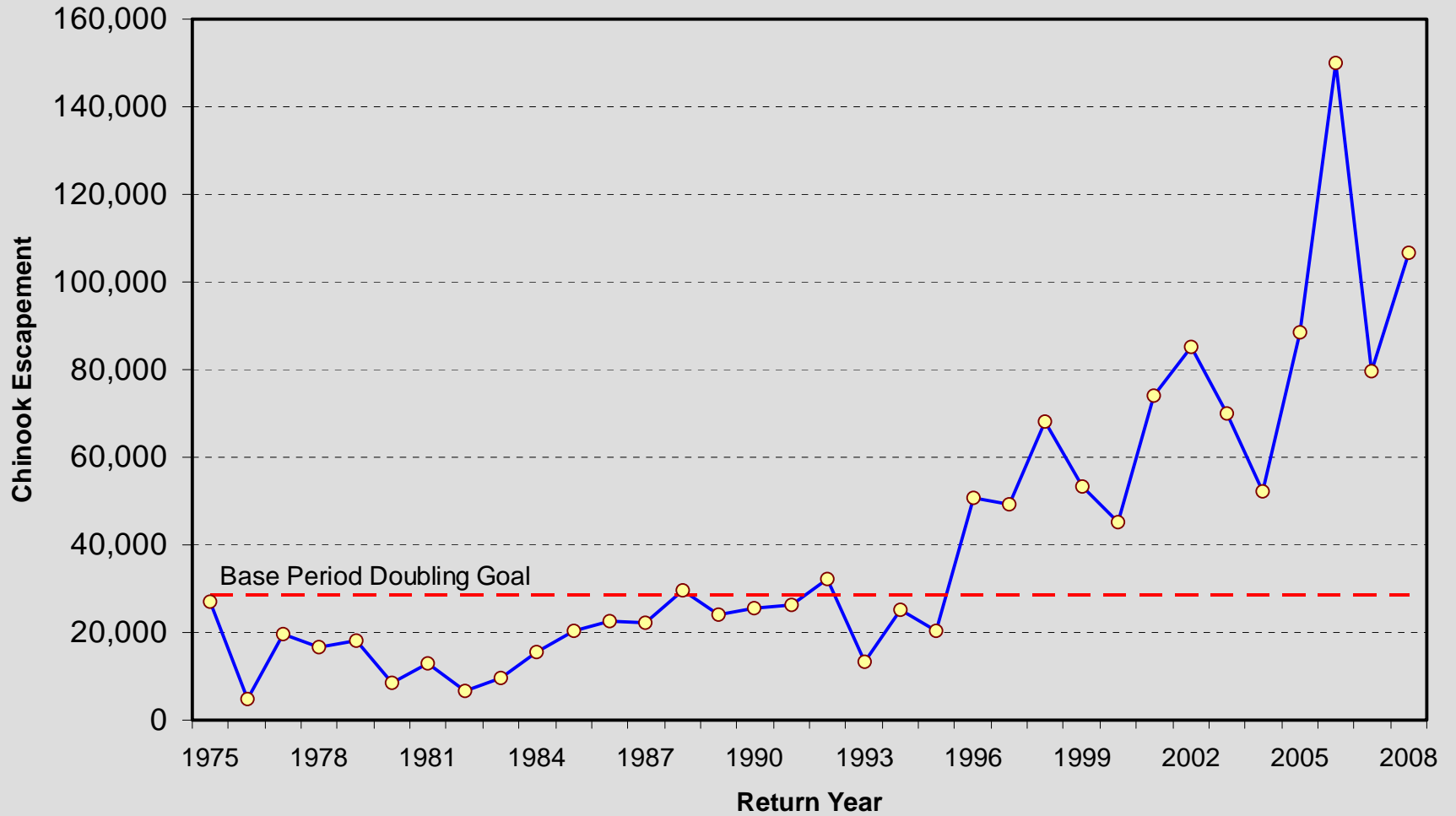
# Fraser Spring-Run 4<sub>2</sub> (CTC Indicator Stocks) (With Bonaparte added - dashed line after 1994)



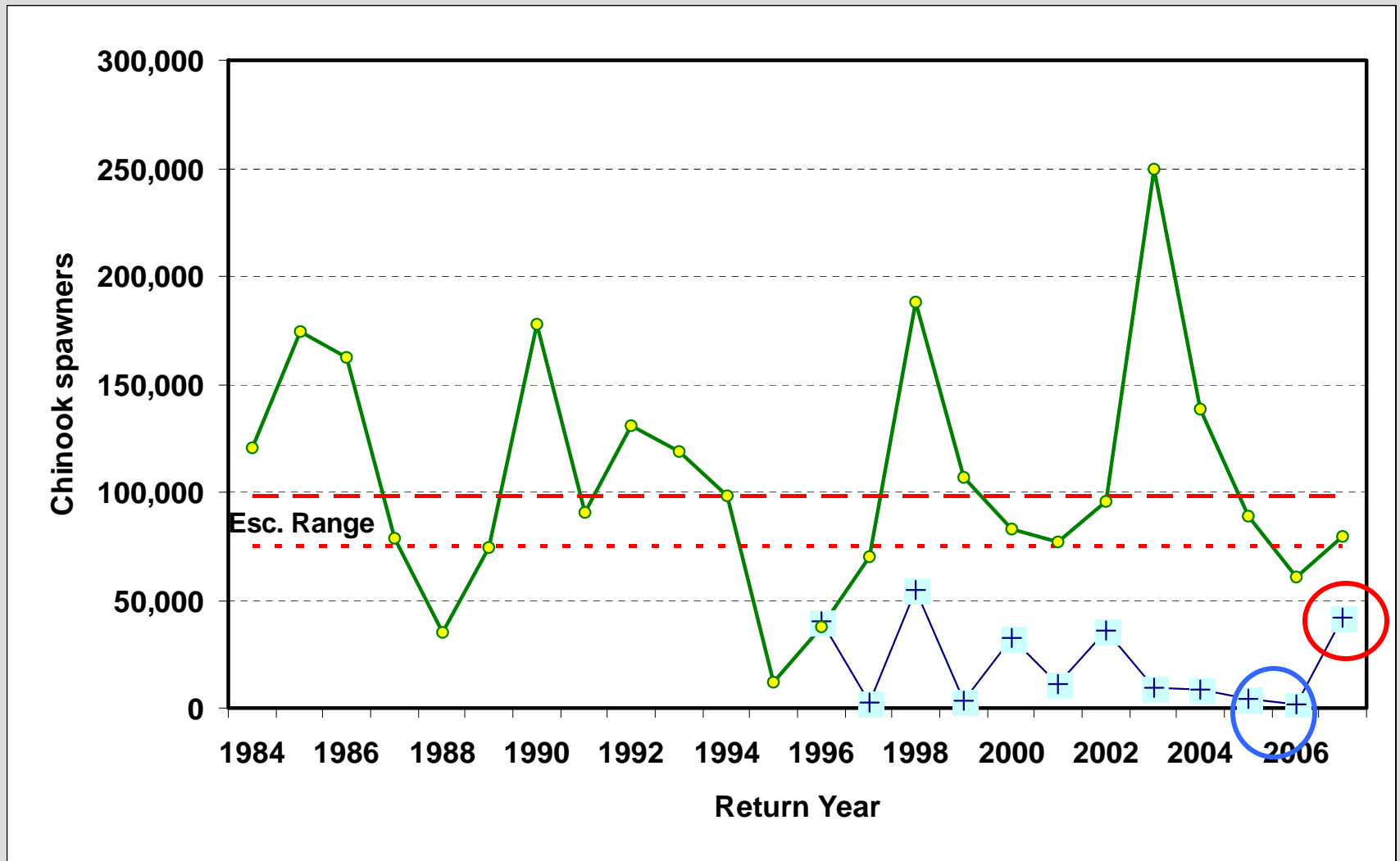
# Fraser Summer-Run 5<sub>2</sub> (CTC Indicator Stocks)



# Fraser Summer-Run 4<sub>1</sub> (CTC Indicator Stocks)



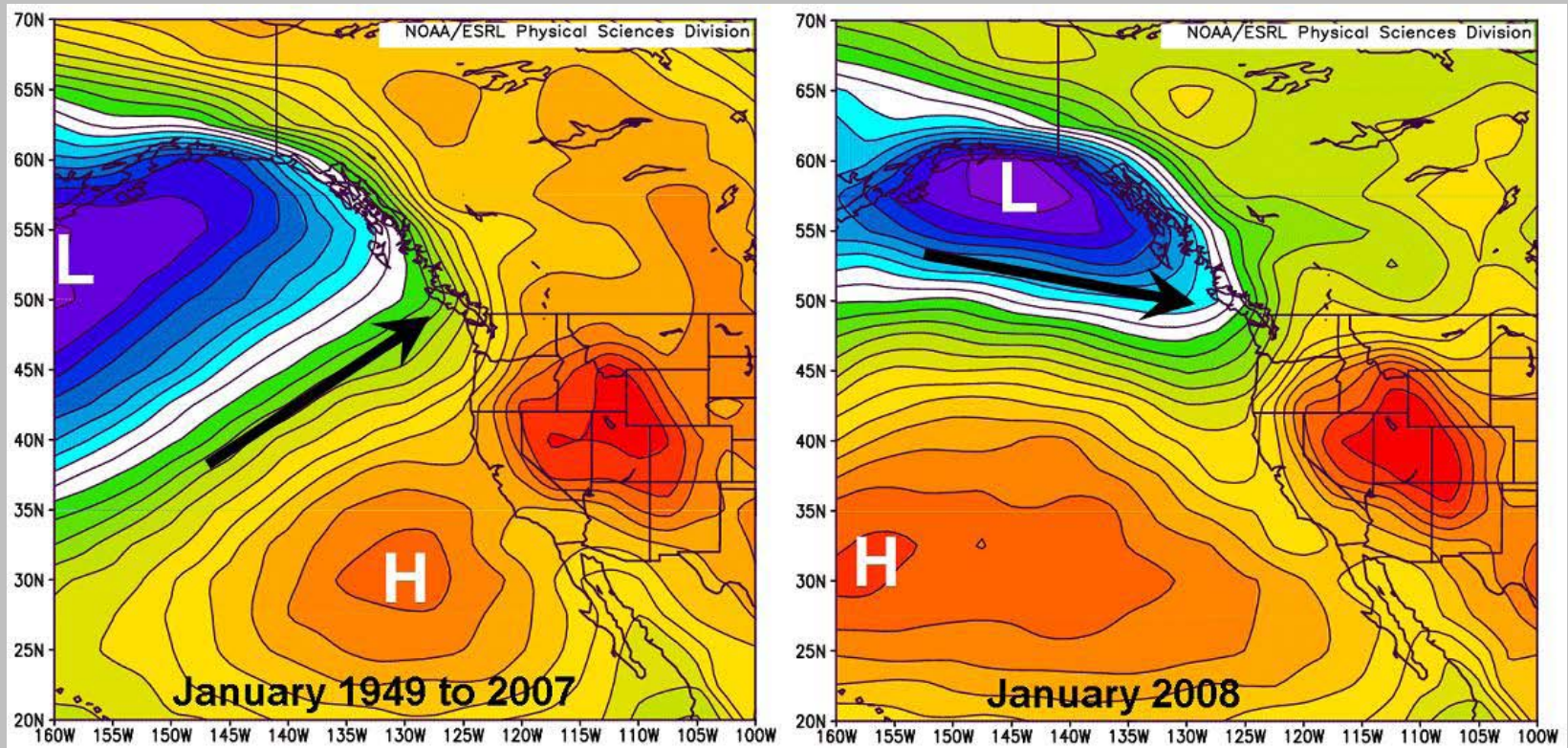
# Harrison River White Chinook (Adults and Jacks)



2008 estimate likely < 50,000!

# State of the Pacific Ocean - 2007

*Average sea surface pressure for January of 1949 - 2007 (left), and January 2008 (right)*



**Canadian & Pacific Northwest coastal temperatures depend on the direction of the winter winds. Stronger westerlies bring cooler waters.**

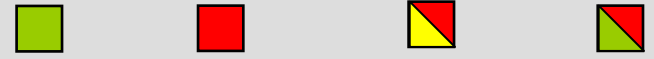
# BC Coast

## Smolt year

### Local and regional physical indicators

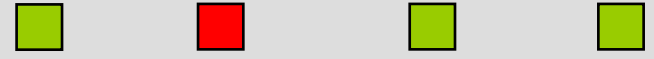
2000      2005      2006      2007

**Water temperature (WCVI)**



### Local and regional biological indicators

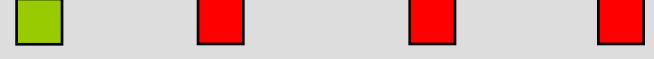
- **Phytoplankton bloom (WCVI)**



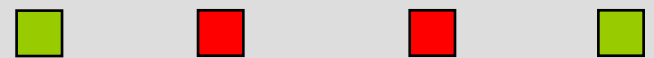
- **Plankton peak (WCVI)**



- **Euphausiid biomass (WCVI)**



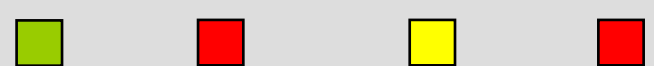
- **Southern copepods (WCVI)**



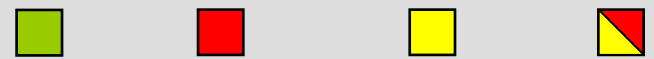
- **Coho growth (WCVI coho)**



- **July size (SoG coho)**



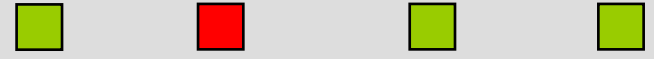
- **July CPUE (SoG coho)**



- **July CPUE (SoG sockeye)**



- **Sept CPUE (SoG sockeye)\***



- **Bird production (Triangle Is.)**



# Summary

- Although globally 2007 was the 2<sup>nd</sup> warmest year in recent history, the BC marine environment was generally cool during winter 2007 and early 2008.
- Stronger-than-normal westerly winds in winters of 06-07 and 07-08 brought cooler waters to BC, along with a general dominance of boreal & subarctic zooplankton
- Ocean temperatures measured at lighthouses were warmer than normal in the summer of 07, and cooler in the winters of 06-07 and 07-08.
- A strengthening La Niña during the winter of 07/08 foretells a cool spring and early summer that should benefit most cool water species, although there will be time lags before we see benefits, particularly for longer-lived species.  
(spring 2008 forecast)

New Science initiatives to study climate change, ecosystems impacts, and salmon production.

1. Strait of Georgia Ecosystem Initiative: What has happened to Chinook and coho production in the Strait? (on-going)
2. North Pacific Ecosystems: 2 international workshops in 2008 to design long-term monitoring and research amongst five member Nations of NPAFC (completed)
  - a. **“International Year of the Salmon” 2011 or 2012**
3. Moore Foundation studies (4 projects) assess impact of climate change on salmonid ecosystems (freshwater and marine). (on-going)
4. MALBEC ...modelling study of carrying capacity of the North Pacific Ocean, density dependence between species, and climate scenarios. (completed)