



Agenda Item D.2.b

West Coast Salmon Work Group Progress Report PowerPoint

September 2008

NOAA Fisheries Sponsored Working Group to Assess the Causes of Recent Salmon Decline

Churchill B. Grimes

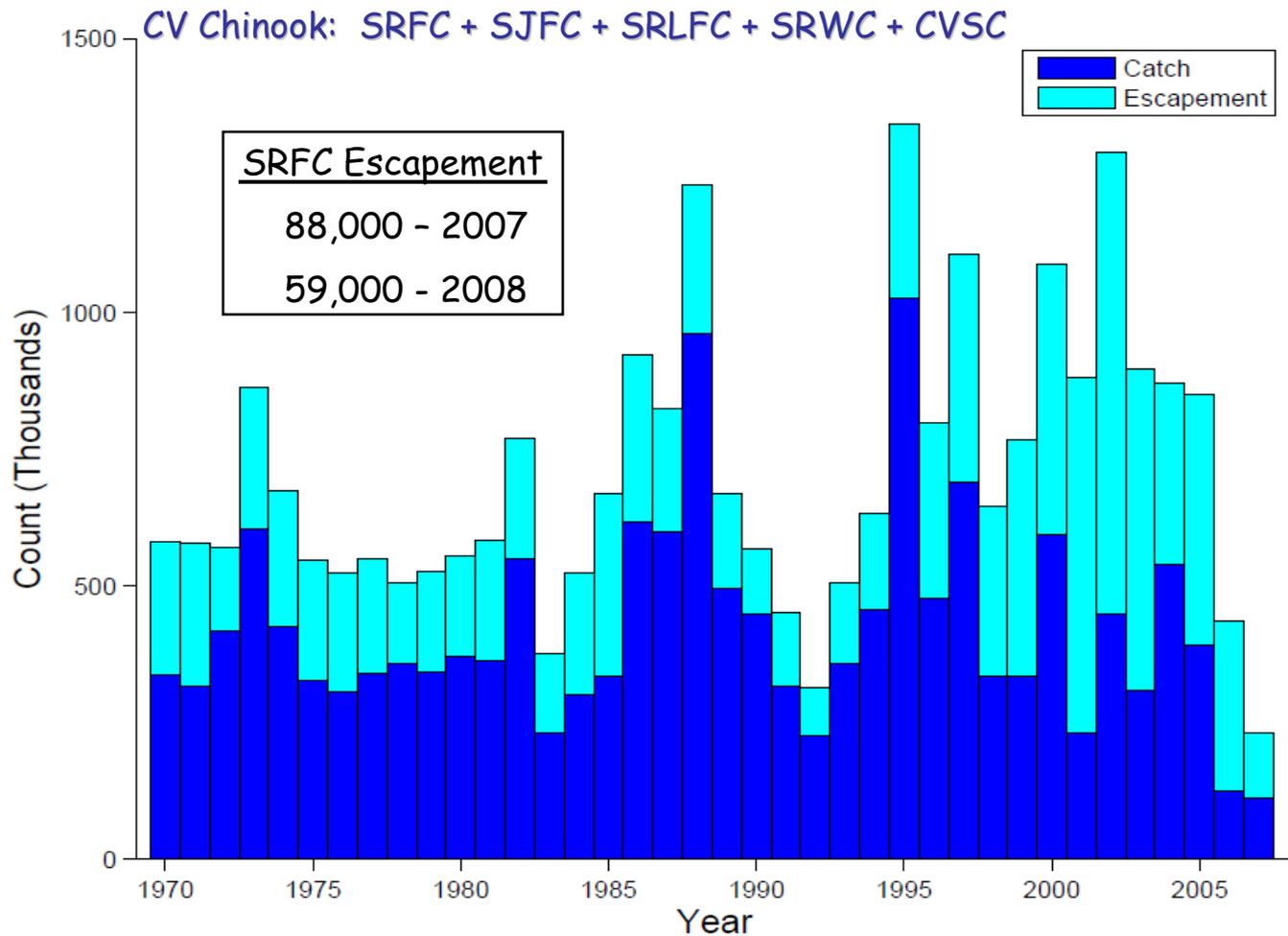
NMFS, Southwest Fisheries Science Center
and

John E. Stein

NMFS, Northwest Fisheries Science Center

What's the Problem/Why was the Working Group Formed?

The Central Valley Index = Chinook ocean harvest South of Pt. Arena +
CV Chinook spawner escapement





Composition of the Scientific Working Group

- Co-chairs- Churchill Grimes (SWFSC) and John Stein (NWFSC)
- NOAA members - Daniel Bottom (NWFSC), John Ferguson (NWFSC), Peter Lawson (NWFSC), Steven Lindley (SWFSC), Bruce McFarland (SWFSC), William Peterson (NWFSC), Carlos Garza (SWFSC), Michael Mohr (SWFSC), Brian Wells (SWFSC), Robert Kope (NWFSC), Robin Webb (OAR, ESRL), Tracy Collier (NWFSC), and Frank Schwing (SWFSC)
- PFMC - Chuck Tracy
- CDFG - Alice Low, Melodie Palmer-Zwahlen, and Allen Grover
- ODFW - Kelly Moore
- WDFW - Craig Busak
- USFWS-CA - James Smith
- Academia - Loo Botsford, UC Davis, David Hankin, Humboldt State University, and James Anderson, University of Washington.



Charge to the Working Group

- Consider potential causes of the recent collapse of SRFC, and what may be a broader depression of salmon productivity for stocks involved in west coast fisheries from the Sacramento River north to Puget Sound.
- Specifically examine potential factors provided in a PFMC list that could have contributed to the low survival of the 2004 and 2005 brood years in the attempt to identify possible causative factors.
- Assess whether the performance of current stock predictors can be improved by incorporating ocean environmental information.
- Develop research and monitoring recommendations for improving the understanding of causes of decline and stock forecasts.
- Produce an interim and final report to PFMC and submit a paper for publication in a peer reviewed journal.



Process and Schedule - Completed

- (1) **First Working Group Meeting** (July 28-29, 2008): Internal organizational meeting to confirm the approach, further develop TOR for conducting analysis and synthesis of available information, identification of information gaps, organize how the report will be developed and method to collect existing data, etc.
- (2) **First Formal Working Group Meeting** (August 29, 2008 in Sacramento, California): Conduct a public meeting to seek data and input on the issue from interested individuals and agencies. Knowledgeable parties will be invited and asked to bring data on subjects pertinent to assessing the possible causes for the decline.
- (3) **Attend NCEAS Pelagic Organism Decline Working Group Meeting** (September 2-4, 2008 in Santa Barbara): Participate in ongoing work group to assess impacts of water quality on pelagic organisms in the delta to determine if this work group has information suggesting impacts to Sacramento River fall Chinook.
- (3) **Status Report to the Pacific Fisheries Management Council** at the September 7-12, 2008 meeting in Boise, Idaho. The status report will summarize progress to date. The report is expected to yield analysis that some potential factors listed above are not likely explanations for the decline of the SRFC stock, and will be eliminated from further examination.



Accomplishments- First Working Group Meeting (July 28-29, 2008)

Presentations and Discussions :

1. Biology of Central Valley Fall Chinook and Local Patterns and Trends (Lindley)
2. Biology of Coastal Coho and Regional Patterns and Trends (Lawson)
3. Central Valley Freshwater and Estuarine System and Recent Trends (Smith)
4. Central Valley Freshwater and Delta Survival Studies (McFarlane)
5. West Coast Regional-Scale Freshwater Events (CA to Canada) (Webb, via webcast)
6. California Current Large Marine Ecosystem Recent Conditions, Trend, and Forecasting: Northern CA Current (B. Peterson)
7. California Current Large Marine Ecosystem Recent Conditions, Trend, and Forecasting: Southern CA Current (B. Wells)
8. Current PFMC Predictors of Ocean Stock Abundance and Recent Trends (Mohr)
9. Review of list of possible causes of decline



Accomplishments- First Working Group Meeting (July 28-29, 2008)

Organization and Assignments:

- Developed draft outline of the report
- Developed list of data needs and gaps
- Established three work teams: (1) Grimes, Stein, Tracy, Mohr, Kope and Grover (2) Peterson, Moore, Lawson, Busack, Webb and Schwing and (3) Lindley, Ferguson, Botsford, Wells, Smith, Low, Palmer-Zwahlen, Bottom, MacFarlane and Collier).
- Each team developed a list of assignments to complete

Potential Causes of Failure of the 2004 and 2005 Broods of Sacramento River Fall Chinook Salmon

Freshwater Biological Focus

- *Was the level of parent spawners too low, for natural or hatchery populations?*
- *Was the level of parent spawners too high, for natural or hatchery populations?*
- *Was there a disease event in the hatchery or natural spawning areas?*
- *Was there a disease event in the egg incubation, fry emergence, rearing, or downstream migration phases?*
- *Was there any disease event during the return phase of the 2 year old jacks?*
- *Were there mortalities at the time of trucking and release of hatchery fish?*
- *Was there a change in the pattern of on-site release of hatchery fingerlings compared to trucked downstream release?*
- *Was there a change in recovery, spawning and/or release strategies during hatchery operations?*
- *Did thermal marking occur for any hatchery releases? What were the effects of this or other studies (e.g. genetic stock identification of parental broodstock)?*
- *Was there a change in the methodology or operations of the San Francisco Bay net pen 'acclimation' program for trucked hatchery fish?*
- *Were there any problems with fish food or chemicals used at hatcheries?*

Potential Causes of Failure of the 2004 and 2005 Broods of Sacramento River Fall Chinook Salmon

Freshwater Habitat Areas Focus

- Were there drought or flood conditions during the spawning, incubation, or rearing phases?
- Was there any pollution event where juveniles were present?
- Was there anything unusual about the flow conditions below dams during the spawning, incubation, or rearing phases?
- Were there any in-water construction events (bridge building, etc.) when this brood was present in freshwater or estuarine areas?
- Was there anything unusual about the water withdrawals in the rivers or estuary areas when this brood was present?
- *Was there an oil spill in the estuary when the 2005 brood was present, as juveniles or jacks?*

Potential Causes of Failure of the 2004 and 2005 Broods of Sacramento River Fall Chinook Salmon

Freshwater Habitat Areas Focus (cont.)

- Was there any unusual temperature or other limnological conditions when this brood was in freshwater or estuarine areas?
- Was there any unusual population dynamics of typical food or prey species used by juvenile Chinook salmon in the relevant freshwater and estuarine areas?
- Was there anything unusual, in the same context as above for juvenile rearing and outmigration phases, about habitat factors during the return of the 2 year olds from this brood?
- *Were there any deleterious effects caused by miscellaneous human activities (e.g., construction, waterfront industries, pollution) within the delta and San Francisco bay areas?*
- Was there a change in the recovery of juvenile outmigrants observed in the USFWS mid-water trawl surveys and other monitoring programs in the Delta.

Potential Causes of Failure of the 2004 and 2005 Broods of Sacramento River Fall Chinook Salmon

Freshwater Species Interactions Focus

- *Was there any unusual predation by bird species when this brood was in freshwater or estuarine areas?*
- *Was there any unusual sea lion abundance or behavior when this brood was in freshwater or estuarine areas?*
- **Was there any unusual striped bass population dynamics or behavior when this brood was in freshwater or estuarine areas?**
- *Were northern pike present in any freshwater or estuarine areas where this brood was present?*
- **Is there a relationship between declining Delta smelt, longfin smelt, and threadfin shad populations in the Delta and Central Valley Chinook survival?**
- *Was there additional in-river competition or predation with increased hatchery steelhead production?*

Potential Causes of Failure of the 2004 and 2005 Broods of Sacramento River Fall Chinook Salmon

Marine Biological Focus

- Was there anything unusual about the ocean migration pattern of the 2004 and 2005 broods?
- Was there anything unusual about the recovery of tagged fish groups from the 2004 and 2005 broods the ocean salmon fisheries?
- *Has the bycatch in non-salmonid fisheries (e.g., whiting, groundfish) increased?*

Potential Causes of Failure of the 2004 and 2005 Broods of Sacramento River Fall Chinook Salmon

Marine Habitat Focus

- Were there periods of reduced upwelling or other oceanographic physical conditions during the period of smolt entry into the marine environment, or during the period of marine residence up to the return to freshwater of the jacks?
- *Were there any effects to these fish from the 'dead zones' reported off Oregon and Washington in recent years?*
- Were plankton levels depressed off California, especially during the smolt entry periods?
- *Was there a relationship to an increase in krill fishing worldwide?*
- Oceanography: temperature, salinity, upwelling, currents, red tide, etc.
- *Were there any oil spills or other pollution events during the period of ocean residence?*
- *Was there any aquaculture occurring in the ocean residence area?*
- *Was there any offshore construction in the area of ocean residence, for wave energy or other purposes?*

Potential Causes of Failure of the 2004 and 2005 Broods of Sacramento River Fall Chinook Salmon

Marine Species Interactions Focus

- Were there any unusual population dynamics of typical food or prey species used by juvenile Chinook salmon in marine areas? (plankton, krill, juvenile anchovy or sardines, etc.)
- Was there an increase in bird predation on juvenile salmonids caused by a reduction in the availability of other forage food?
- *Was there an increase of marine mammal predation on these broods?*
- *Was there predation on salmonids by Humboldt squid?*
- Was there increased predation on salmonids by other finfish species (e.g., lingcod)?

Cumulative Ecosystem Effects Focus

- factors?
- Were there other ecosystem effects?
- Were there synergistic effects of significant



Accomplishments- First Formal Working Group Meeting (August 29, 2008 in Sacramento, California)

Attendance

<i>Name</i>	<i>Affiliation</i>	<i>Workgroup Members in attendance</i>	
Anderson , Jim	Half Moon Bay	Anderson, Jim	University of Washington
Brandes, Pat	USFWS	Botsford, Louis	U. C. Davis
Chappell, Erin	DWR	Collier, Tracy	NWFSC-Seattle
Duran , Joe	CDFG - Ocean Salmon Project	Ferguson, John	NWFSC-Seattle
Fosmark , Kathy	PFMC council member	Garza, Carlos	SWFSC-Santa Cruz
Goldenberg, David	California Salmon Council	Grimes, Churchill	SWFSC-Santa Cruz
Hannon, John	USBOR	Lindley, Steve	SWFSC-Santa Cruz
Hashagen , Ken	Hanson Environmental	Low, Alice	CDFG
Israel, Josh	UC Davis	MacFarlane, Bruce	SWFSC-Santa Cruz
Kuivila, Kathryn	USGS	Mohr, Michael	SWFSC-Santa Cruz
Lee , Dennis P.	Craimer Fish Sciences	Smith, Jim	USFWS
Lee , G. Fred	G. Fred Lee and Associates	Stein, John	NWFSC-Seattle
MacLean, Duncan	SAS PFMC	Tracy, Chuck	PFMC-Portland
McIsaac, Don	PFMC	Williams, Tommy	SWFSC-Santa Cruz
Obegi, Doug	NRDC		
Pierce , Paul	SAS PFMC		
Rosenfield, Jon	The Bay Institute		
Van Ruiten , Anthony J.	Best, Best and Krieger		
Webb, Kim	USFWS		
Williams , John	independent consultant		
Witalis, Shirley	NMFS		
Workman, Michelle	EBMUD		

Presentations

- Brandes**- Temporal trends in juvenile abundance in the delta
- Williams**- Temporal trends in hatchery and natural production



Process and Schedule - To Do

- (4) **A public comment meeting in California** (January 2009): This meeting will provide an opportunity for constituent input and comment.
- (5) **Draft Final Report** presented formally at the April 4-9, 2009 Council meeting in Millbrae, California.
- (6) **Submission of a manuscript** to a scientific journal describing results of the working group analysis and conclusions, Spring 2009.



Extra



Outline of Report

- I. SRFC collapse
- II. Regional forcing and response
- III. Unusual Events
 - 04/05/06 brood years
- IV. Conclusions (recent collapse)
- V. Biocomplexity
- VI. Recommendations
 - research and management