

## Salmon Bycatch Workgroup meeting minutes

The NPFMC Salmon Bycatch Workgroup convened at 9am on August 29<sup>th</sup>, 2007 at the Hawthorn Suites in Anchorage, AK.

Members of the workgroup were the following:

Stephanie Madsen, co-chair

Eric Olson, co-chair

Becca Robbins Gisclair

Karl Haflinger

John Gruver

Jennifer Hooper

Paul Peyton

Michael Smith

Staff assisting in the meeting and members of the public in attendance included the following:

Diana Stram (NPFMC), Cathy Coon (NPFMC), Jason Anderson (NMFS), Alan Haynie (NMFS AFSC), Jim Ianelli (NMFS AFSC by phone), Martin Loeffland (NMFS AFSC), Tim Baker (ADF&G), Dani Evenson (ADF&G), Herman Savikko (ADF&G), Gene Sandone (ADF&G), Chris Oliver (NPFMC), Jim Seeb (ADF&G), Eric Volk (ADF&G), Don Rivard (USFWS/OSM), Russ Holder (USFWS), Dan Bergstrom (ADF&G), Karen Gillis (BSFA), Anne Vanderhoeven (BBEDC), Chris Stark (UAF), Brent Paine (UCB), Jill Klein (YRDFA), Ragnar Alstrom (Yukon Delta CDQ), Bill Quinlavin (Yukon Delta CDQ), Simon Kinneen (NSEDG), Robin Samuelson, Art Nelson(CVRF), and Larson Hunter(CVRF).

The attached agenda (appendix 1) was adopted for the meeting. Documentation provided to participants in advance of the meeting is attached (appendices 2 and 3).

Dani Evenson and Tim Baker of ADF&G provided a presentation of 2007 in river returns to the Nushagak, Yukon, and Kuskokwim river systems. Meeting participants discussed the expected versus preliminary returns as well as the age composition breakdowns of those numbers. In the Yukon, it was noted that the 6 year old fish are the dominant age class in the returns and that the age composition of the returns follows the expected breakdown however the numbers thus far are low. For the Nushagak the 1.2, 1.3, and 1.4 fish dominate the returns. Preliminary data on run returns by river system for Chinook salmon in 2007 indicated that observed returns were much lower than expected returns for three river systems (Nushagak, Yukon and Kuskokwim) while one river system (Unalakleet) had higher observed returns than the expected goal. Preliminary regression analyses comparing western Alaskan Chinook returns with BSAI trawl bycatch suggest an increased harvest rate in recent years.

Discussion noted that on-going genetic stock identification techniques by Drs Jim and Lisa Seeb will provide updated information on the relative contribution from various western Alaska river sources in the bycatch. An update on this preliminary work was provided by Jim Seeb at the previous SBW meeting, and it is anticipated that published results of this work may be available as early as February 2008.

Jim Ianelli participated by phone and presented investigations on methods to evaluate bycatch impacts on salmon runs. This method can be used to evaluate the impact of a single salmon

bycatch cap or alternatively, to arrive at a cap level on the basis of acceptable risk to salmon runs. This work is being refined for application in the amendment package.

The remainder of the presentation portion of the meeting involved a review of Council alternatives and presentation of preliminary results of additional cap formulations and closure configurations by Council staff (Diana Stram, Cathy Coon) and NMFS AFSC staff (Alan Haynie). These included preliminary results of average bycatch numbers for cap formulation, proposed incremental percentages above the average and highest year to address cap alternative 1b and the need for further clarification regarding the intent of cap alternative 4 “international treaty considerations”.

Discussion with members of the committee as well as members of the public present focused upon the intent of the Yukon River Agreement with respect to addressing cap alternative 4. The actual language of the treaty was discussed as well as the obligation of the Council to adhere to its intent. Members of the Yukon River Panel present noted that the initial concern in signing this agreement was about the actual numbers of bycatch from the fishery at the time of the signing of the treaty in 2001.

Numerous issues and clarifications were raised by the committee in discussions of the closure configuration methodologies proposed as well as the need for additional information from the agency on possible alternative methodologies. These clarifications include the following:

- Definition of criteria for rate-based cutoffs in defining closures?
- Regulatory structure and flexibility within which to refine closures?
- Could rates be identified in one year and used to define closures in the following year?
- How can we best deal with inter-annual variability?
- Importance of considering the enforcement implications of various sized closures and configurations

Per request of Dr. Haynie, further discussion commented on what must be considered in evaluating the potential impacts on the pollock fleet of proposed new closures. These impacts should include travel time for shore-based boats, fuel costs, and loss of quality. It was noted by members of the industry that roe quality issues will be particularly difficult to evaluate. Karl Haflinger noted that in his experience with Sea State closures, it is difficult to predict where displaced vessels will go to fish when closed out of certain areas. John Gruver further noted that the vessels tend not to necessarily spread out when they are displaced but often to clump and that the general response to closures appears to be non-linear. Robin Samuelson further suggested that indications of impacts on the fleet should be broken out by sector, looking separately at motherships, catcher processors and catcher vessels.

The meeting then broke into discussion groups between the trawl industry representatives and the western Alaskan representatives. Following discussion and deliberations amongst groups regarding recommendations to the Council and for the analysts, both groups reconvened to offer their respective reports. What follows are the consensus recommendations of the entire Salmon Bycatch Workgroup following deliberation of various options brought forward by either side. Changes from the initial cap alternatives are shown in strike-out and bold while further recommendations to analysts or the Council (outside of these specific cap alternatives) are also shown in bold.

Cap Formulation alternatives:

1. Establish cap based on:

- a. Average historical bycatch;
    - i. 3 years (2004-2006)
    - ii. 5 years (2002-2006)
    - iii. 10 years (1997-2006)

**Option: drop 2000**
  - b. Percentage increase of :
    - i. Historical average
      - 1. 10%
      - 2. 20%
      - 3. 30%
    - ii. Highest year
      - 1. 10%
      - 2. 20%
      - 3. 30%
2. Set cap relative to salmon returns:
- a. ~~short term: link historic bycatch to in river returns~~
  - b. ~~long term: Use cumulative acceptable amounts for each river system, pending GSI information (i.e., identify what component of bycatch is from each river and what would be an acceptable amount of bycatch for each river. The cap would be the sum of the acceptable amounts for each of the rivers).~~
- Recommend that analysts prepare draft language to better characterize on-going investigations by analysts here for presentation to the Council in October**
- 3. Incidental Take Permit amount
  - 4. International treaty considerations
    - a. **Average historical bycatch pre-2002**
      - i. 3 years (1999-2001)
      - ii. 5 years (1997-2001)
      - iii. 10 years (1992-2001)
    - b. **Percentage decrease of historical averages:**
      - i. 10% decrease
        - 1. 3 years (1999-2001)
        - 2. 5 years (1997-2001)
        - 3. 10 years (1992-2001)
      - ii. 20% decrease
        - 1. 3 years (1999-2001)
        - 2. 5 years (1997-2001)
        - 3. 10 years (1992-2001)
      - iii. 30% decrease
        - 1. 3 years (1999-2001)
        - 2. 5 years (1997-2001)
        - 3. 10 years (1992-2001)

**Closure configuration recommendations:**

**Recommend that staff develop a method to apportion caps by closure area in a way that minimizes bycatch (e.g. to evaluate separate trigger caps by closure area apportioned according to the overall limit) as well as a single cap which triggers multiple areas.**

Staff was requested to obtain further clarity on the ability (in a regulatory sense) to modify trigger caps in-season as well as scenarios of potentially reopening a closed area following a decrease in

observed bycatch levels. It was also noted that fixed closures remain as an alternative to be evaluated.

**Recommend that status quo in the alternatives be described as the VRHS system with the existing exemption to the CSSA closures. Recommend that an option be explicitly added to the alternatives for new closures which would likewise allow for an exemption for the fleet to these new closures.**

It was clarified that this exemption option is to apply only to the alternatives under consideration which would implement new salmon savings area closures. This exemption would not be intended to apply to hard cap formulations.

**Recommend that additional rate-based breaks be considered in formulating criteria for identifying closures such that a more defined and consistent range of rate breaks are considered (e.g. 0.1, 0.2, 0.3, 0.4, ...)**

This recommendation was made to address the draft methodology presented which relied solely upon natural breaks in the data (for example purposes only). Additional commentary from the workgroup requested that the upcoming analysis indicate the relative amount of pollock in the areas removed as well as the percentage of pollock tows in the area as presented.

Several questions and clarifications of interest to members of the workgroup were unable to be specifically resolved at the meeting due to the necessity of consultation with the agency and possibly NOAA GC in order to address them. These questions included the following:

- What is the ability to framework aspects of the alternatives in regulation?
- What are the legal obligations and responsibilities under the Pacific Salmon Treaty (i.e. the Yukon River Agreement)?
- What type of NEPA analysis will be required for the forthcoming salmon bycatch amendment analysis, an EA or an EIS?

Understanding that Council staff and agency staff were scheduled to have a meeting the following day to investigate several legal and in-season management issues regarding some of the ideas discussed for further refining and formulating alternatives, the workgroup looks forward to an update from staff at a time following this meeting to better inform the SBW members on the potential implications for refining alternatives.

The meeting adjourned at 4:15pm.

## Appendix 1: meeting agenda

### NPFMC Salmon Bycatch Workgroup meeting

August 29, 2007

Ballroom B, Hawthorne Suites,

1110 West 8<sup>th</sup> Avenue

Anchorage, AK

Agenda

Meeting objective: Salmon Bycatch Workgroup to review on-going work by analysts on refining alternatives for analysis for salmon bycatch amendment package

9:00am- 5:00pm

*lunch break 12:00-1:00pm*

Topics to be addressed:

- 1- Introductions and discussion of continuation of role of Salmon Workgroup.  
*Olson/Madsen*
- 2- Summary of 2007 Inriver Chinook Salmon Runs Nushagak, Yukon and Kuskokwim River 2007 Chinook Runs Compared to projected and description of Nushagak River Chinook fishery – Dani Evenson and Tim Baker
- 3- Review of Council alternatives and objective for October meeting: revised alternatives per Salmon Work Group recommendations (June 2007). Plan for further revisions of alternatives and Council staff discussion paper for review in October *Stram*
- 4- Preliminary cap analysis: preliminary work on hard cap estimation and trigger cap numbers by season and annual totals *Stram/Ianelli*
- 5- Spatial evaluation of candidate closures I (A and B season). Evaluation of closures and salmon hot spots using observed salmon numbers and salmon bycatch rates *.Coon/Stram*
- 6- Spatial evaluation of candidate closures: Evaluation of candidate closures using a proposed optimization technique *Haynie*
- 7- Workgroup Discussion and recommendations for Council consideration

## Appendix 2: Background paper for caps

### BSAI Salmon Bycatch

#### Update on Salmon Bycatch analysis

The following provides a brief overview of the current suite of alternatives and progress towards analysis for refinement of the alternatives under consideration by the Council for the forthcoming salmon bycatch reduction amendment analysis. These alternatives include modifications made by the Council in June following the recommendations of the Salmon Bycatch Workgroup.

This amendment package will evaluate alternative means of salmon bycatch reduction measures, focusing on time area closures and catch limits on the pollock fishery. Alternatives to be considered by the Council will include a range of closure configurations (fixed time/area closures and triggered time/area closures) as well as options for different means of establishing caps, both trigger caps (connected with a time/area closure or closure system) and a hard cap (upon attainment of which all pollock fishing must stop). Alternatives are intended to be formulated such that caps and closures may be selected by the Council (in crafting their preferred alternative) in conjunction with each other.

A specific description of the alternatives including closure configurations options and the cap formulations (below) will be drafted prior to the October Council meeting for Council consideration. Analysts are currently working on several different methodologies for proposed closure configurations. Analysis focuses on rates of salmon bycatch by area in the pollock fishery, absolute numbers of bycatch in the fishery by area in the pollock fishery and a cost-benefit scheme for optimizing closure configurations in conjunction with fishing opportunities. Based upon action by the Council at the June 2007 meeting, the following year combinations are the focus for analysis (both spatially and for catch limits): 2004-2006 (3 years); 2002-2006 (5 years); 1997-2006 (10 years). Consideration will also be given to bycatch numbers and rates reported preliminarily from the 2007 A season. The 2007 B season is currently underway and all bycatch estimates are too preliminary to be included in the analysis at this point.

#### **Cap considerations**

Specific cap considerations will include the following formulations for both trigger and hard caps methodology:

5. Establish cap based on:
  - a. Average historical bycatch;
    - i. 3 years
    - ii. 5 years
    - iii. 10 years
  - b. Percentage increase of :
    - i. Historical average
    - ii. Highest year
6. Set cap relative to salmon returns:
  - a. short term: link historic bycatch to in-river returns
  - b. long term: Use cumulative acceptable amounts for each river system, pending GSI information (i.e., identify what component of bycatch is from each river and what would be an acceptable amount of bycatch for

each river. The cap would be the sum of the acceptable amounts for each of the rivers).

- 7. Incidental Take Permit amount
- 8. International treaty considerations

For the average historical bycatch years the “most recent year” under consideration is currently considered to be 2006, thus the years utilized for average bycatch are as listed previously. The percentage increase over the historical average and the highest year is estimated based on an evaluation of relative increase from the mean rate by year (75-100% greater than a given average) and by the relative increase from the highest numbers by year (10-20% higher than the highest year). These estimated ranges bracket the variability over the time period under consideration.

Chinook limits: average historical plus options (June motion 2007)

		Chinook:			
Average historical:		A season	B season	Total	B+A accounting (total)
3 year	2004-2006	41,772	31,240	75,300	
5 year	2002-2006	37,911	23,988	64,235	
10 year	1997-2006	28,374	17,613	49,562	

Percent increase:

		Total	A season	B season	B+A accounting (total)		
historical average: 75%>, 100%>							
Average historical:		75% <sup>1</sup>	100% <sup>1</sup>	75% <sup>1</sup>	100% <sup>1</sup>	75% <sup>1</sup>	100% <sup>1</sup>
3 year	2004-2006	131,775	150,600	73,101	83,544	54,670	62,480
5 year	2002-2006	112,411	128,470	66,344	75,822	41,979	47,976
10 year	1997-2006	86,734	99,124	49,655	56,748	30,823	35,226
		Total	A season	B season	Total		
10%>, 20%>		10% <sup>2</sup>	20% <sup>2</sup>	10% <sup>2</sup>	20% <sup>2</sup>	10% <sup>2</sup>	20% <sup>2</sup>
Highest year:	(2006): 87,786	96,565	105,343	67,747	73,906	44,067	48,073 111,814 121,979

1-based on evaluation of relative increases from the mean rate by year (attach rate spreadsheet for justification)  
 2-based on relative increases from the highest number by year (attach rate spreadsheet for justification)

A cap level linked to the relative magnitude of salmon returns could be established based on evaluating historical run-strengths, total bycatch mortality, and relative bycatch stock composition (i.e., the stock origins found in the bycatch). The historical data used may be limited (for some runs the period of data availability may be short) and due to inherent uncertainties at each stage, the decision for setting a cap using a scientific approaches necessitates two steps: 1) defining a reference impact rate (i.e., mortality of run attributed to bycatch), and 2) defining “acceptable” probabilities that a cap will exceed the defined impact rate. For example, a cap could be determined based on analysis that showed: “there was a 10% chance that a cap level of x salmon will exceed an impact rate of 5%.”

The final two cap formulations are specific numbers that represent agreed upon bycatch levels. The first “Incidental Take Permit” amount is the revised threshold level for triggering a formal consultative process for endangered Chinook salmon species in the BSAI area. This number was revised following the 2006 consultation and is currently 87,500 fish. The second number indicated by “international treaty considerations” is intended to reflect the bycatch levels agreed upon in formulation of the Pacific Salmon Treaty and specifically the Yukon River Salmon Agreement in 2002. While there is no hard number associated with this treaty amount, bycatch numbers at the time of the signing of the agreement were intended to be reduced. A means of evaluating this as a numerical value would be to look at the values up to and including 2002 with the intention of reducing numbers below this amount.

An additional consideration for the cap/closure system will be an option to modify the accounting year for the salmon biological year. This means that the accounting system for salmon species would begin in the B season and continue through the A season, i.e. accounting would begin in June and continue through May. The intention of this option is that it more closely tracks the salmon biological year whereby juvenile salmon (those primarily taken as bycatch) likely enter the Bering Sea in the fall to feed and remain on the grounds throughout the winter. This group then migrates to other locations during the summer months prior to beginning their return to the natal streams (those that are of spawning age) in the summer. Thus, the same cohort of salmon that are being caught in the B season remain on the grounds in the A season and any closure potentially triggered by high B season Chinook catch would protect the same age class of salmon from additional impacts in the A season. This is in contrast to the current accounting system whereby the catch accounting for salmon begins January 1 and tracks through December 31<sup>st</sup>. A closure which is triggered due to high rates of catch following the A season is then actually protecting a different cohort of salmon in the B season from those that triggered the need for protection following the A season.

### ***Closure considerations***

Draft closure configurations will be circulated for discussion purposes for the Salmon Bycatch Workgroup meeting. These closure configurations are intended as a starting point to assist the Council in refining alternatives for analysis at the October 2007 Council meeting. Some additional considerations for the closure configuration system still to be formulated and evaluated include:

- Setting separate caps or rates for different closure areas;
- Increasing size and/or number of closure areas based on number of salmon caught (i.e., the more salmon are caught the more area closed);
- Decreasing size and/or number of closure areas based on number of salmon caught (i.e., the fewer salmon are caught the more area opened).
- Closing set areas at set times when known bycatch is high in that area (i.e., non-triggered, fixed closures).
- Considering time/area bycatch stock composition in closure determinations.
- Closure duration based on historical hotspot duration.

An option that is intended to be included in the suite of alternatives for analysis includes the option to adjust the Chinook and non-Chinook regulatory closure areas periodically based on the most current bycatch data available, such as the 2-3 year rolling average of bycatch rates by species and area.

## Appendix 3: background paper for closure methodology examples

### BSAI Salmon Bycatch

#### ***Closure considerations***

Alternative closure configurations are presented as candidates for consideration by the Salmon Bycatch Workgroup meeting. These closure configurations are intended as a starting point to assist the Council in refining alternatives for analysis at the October 2007 Council meeting. In the first section, simple closure areas are defined following three configuration criteria. These are intended to be invoked when bycatch levels reach a predetermined limit or “hard cap” within a year and are intended to remain closed. In the second section, closures are designed to be invoked based on seasonal area-specific limits (“seasonal triggers”). For example, these are defined by seasonal (monthly) periods such that an area would become closed only if observed bycatch levels exceeded some predetermined limit for that area.

#### **Area closures based on a hard cap**

Adjust the Chinook and non-Chinook regulatory closure areas based on current bycatch data available based on using average bycatch rates by species. Three time periods were proposed by the Council in June 2007.

- i. 3 years 2004-2006
- ii. 5 years 2002-2006
- iii. 10 years 1997-2006

Figures of this methodology are provided in the attached document using A season Chinook bycatch rates - (pollock non-pelagic trawl fishery) as an example. A more in depth presentation will occur at the August workgroup meeting.

The closures were determined based on areas where high levels of bycatch were observed. Once a cap is reached the area would remain closed for the duration of the season. The caps would be set based on several considerations and are discussed separately.

Closure areas can be tailored according to balance bycatch goals with practical fishery and management considerations. For example, a series of smaller closures could be triggered as lower bycatch levels are attained. Alternatively, a single larger area similar to the current CSSA could be closed as an upper limit of bycatch is reached.

Observer data from the non-pelagic pollock trawl fishery was summarized by haul for salmon bycatch. Data has been aggregated over multiple years and large geographic areas in order to address confidentiality restrictions. Bycatch rates were calculated based on observed numbers of salmon per metric ton of pollock. Data were brought into a GIS to be viewed spatially and temporally. Examples here are based on 2004-2006 combined data from the pollock A season for Chinook bycatch. Closure areas were determined by calculating average bycatch rates (number of observed salmon/ t pollock) within a 100 km<sup>2</sup> area (Figure 1). Based on the spatial pattern of bycatch rates natural breaks were using three different criteria. These rates were:

- 1) 0.123 Chinook/t pollock
- 2) 0.220 "
- 3) 0.397 "

These closure configurations are shown in Figures 2-4 and result in successively smaller more fragmented management areas. Table 1 shows the percentage of bycatch inside a proposed closure area for each of these configurations as well percentage of all (observed) tows. For the final analysis the spatio-temporal CPUE (pollock / hour towed) and bycatch rates will be evaluated before and after closures would be invoked.

Closure	Rate (# salmon/mt)	size (nm2)	Total Observed Chinook Inside Closure All Years	Total Observed Chinook	% Observed Chinook in closure	Total Annual Numbers	# of Tows In Closure	Total # of tows	% of tows in closure
1	0.123451	15,756	130,482	144,468	90%	43,494	10,062	13,183	76%
2	0.220423	8,697	111,828	144,468	77%	37,276	7,438	13,183	56%
3	0.3967	2,764	38,754	144,468	27%	12,918	901	13,183	7%

This evaluation revealed that there are several hauls with very high rates compared to the vast majority of pollock trawl operations. The effects of these few hauls could have large impacts on subsequent bycatch analyses for management. For the actual analyses of closures, appropriate data transformations or rank percentiles should be used to ensure robustness to the outliers.

### Seasonally triggered closures

Seasonally triggered closures are intended to be simplified versions of the current rolling hot spot closures used through inter cooperative agreements. The simplifications include using set areas at set times as an option bycatch rates. For this study, historic Chinook A-season bycatch data by 10km areas and months were evaluated using combined data from 1997-2006.(Figure 5). Candidate closure areas were determined using bycatch rates in excess of 0.221 Chinook/t of pollock (Figure 6). As trigger limits are reached, the highest bycatch areas would be closed (Figure 7a). The remaining areas with little or zero bycatch would remain open (Figure 7b). The inseason bycatch rates could be tabulated on a week ending basis and used to determine which areas could remain open (based on being below historic average rates). However, if bycatch levels were high inside a management area then that area could be closed for the rest of the season. This evaluation revealed that higher bycatch rates during February and March over the 10 year period also occur in some the areas (Figures 9 & 10), however April the effort and bycatch distribution changes (Figure 11). Sequential closures could be set on a finer temporal scale (e.g., week to week) as an alternative. For the analysis the increased effort outside of the closure areas should be discussed.

It should be recognized that such rolling closures present Inseason monitoring and regulatory challenges. Staffing needs for inseason monitoring would likely be higher and the ability to write appropriate regulations for a complex set of closures may be unrealistic. Based on the observed variability in bycatch patterns in space and time, the flexibility needed to provide real reductions in bycatch levels appears to fit poorly within a regulatory framework.

Additional considerations for closure configurations include:

- Setting separate caps or rates for different closure areas;
- Using different criteria to delineate high bycatch rate locations
- Increasing size and/or number of closure areas based on number of salmon caught (i.e., the more salmon are caught the more area closed);
- Decreasing size and/or number of closure areas based on number of salmon caught (i.e., the fewer salmon are caught the more area opened).
- Closing set areas at set times when known bycatch is high in that area (i.e., non-triggered, fixed closures).
- Considering time/area bycatch stock composition in closure determinations.

- Closure duration based on historical hotspot duration.

It is hoped that if the extent of these added considerations (and the types of closure specifications presented) should be brought forward for analyses will be determined by the working group.