NATIONAL MARINE FISHERIES SERVICE REPORT

National Marine Fisheries Service (NMFS) Northwest Region will briefly report on recent regulatory developments relevant to groundfish fisheries and issues of interest to the Pacific Fishery Management Council (Council).

NMFS Northwest Fisheries Science Center (NWFSC) will also briefly report on groundfish-related science and research activities.

Council Task:

Discussion.

Reference Materials:

1. Agenda Item E.1.b, NWFSC Report 1: A Summary Report from the NWFSC Bottom Trawl Survey Workshop held October 31–November 2, 2006 in Seattle, Washington.
2. Agenda Item E.1.b, NWFSC Report 2: A Summary Report from the WC Groundfish Data/Modeling Workshop held August 8-10, 2006 in Seattle, Washington.
3. Agenda Item E.1.b, Supplemental NWFSC Report 3: Pre-recruit Survey Workshop: A Summary Report prepared by S. Ralston and J. Hastie.

Agenda Order:

a. Regulatory Activities — Frank Lockhart
b. Science Center Activities — Elizabeth Clarke
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. Council Discussion

Agenda Item E.1.b
NWFSC Report 1
April 2007

A Summary Report from
The NWFSC Bottom Trawl Survey Workshop
held October 31 – November 2, 2006
in Seattle, Washington

NWFSC, FRAM Division
March 15, 2007

Introduction

The following report summarizes the outcomes from The NWFSC Bottom Trawl Survey Workshop, held October 31 – November 2, 2006 at the NOAA Western Regional Center in Seattle, Washington. This workshop was the third "Off-Year" Stock Assessment Improvement Workshops convened during 2006 for the purpose of preparing for the 2007 West Coast groundfish stock assessments. The goal of the bottom trawl survey workshop was to provide stock assessment authors with guidance regarding the incorporation of data from the NWFSC West Coast groundfish bottom trawl survey into stock assessments, particularly those that will be conducted in 2007. The NWFSC bottom trawl survey was initiated in 1998, covering depths from 100-700 fathoms. The survey was expanded in 2003 to include depths ranging from 30-100 fathoms. While data from the 100-700 fathom range have been included in prior assessments, data from the expanded coverage of shallower depths have not.

Primary workshop objectives included 1) review survey protocols and data collected by the NMFS west coast groundfish bottom trawl surveys: AFSC & NWFSC triennial shelf surveys (1977-2004), NWFSC slope survey (1998-2002), and NWFSC "expanded" shelf-slope survey (2003-2006); 2) Evaluate methods for including AFSC and NWFSC survey time series in stock assessments; 3) Evaluate whether recent data from the NWFSC shelf-slope survey can be used to extend "triennial" shelf survey time series included in previous assessment models, particularly in 2007 update assessments (i.e. English sole) or whether the new NWFSC data should be treated as a new time series; And 4) compare design-based (swept-area) and model-based (Generalized Linear Mixed Models) approaches for developing biomass and variance estimates.

Stacey Miller and Jim Hastie from the Fishery Resource Analysis and Monitoring Division (FRAMD) of the Northwest Fisheries Science Center (NWFSC), organized the workshop. Workshop participants included stock assessment scientists, trawl survey personnel, fishing industry representatives as well as members of the public. A comprehensive list of participants is included at the end of this summary report. Travel restrictions for federal travelers somewhat reduced participation.

Objective 1. Review survey protocols and data collected by the NMFS West Coast groundfish bottom trawl surveys.

Participants generally agreed that substantial differences exist between the triennial shelf and NWFSC shelf-slope "expanded" survey protocols and gear (Table 1.). Some of these differences such as towing speed and duration, size and type of the nets and footropes, and selection of tow locations, may contribute to changes in catchability and selectivity. It is difficult to disentangle the effects of the various changes in protocol and gear on catchability and selectivity. However, it appears the effects differ among species.

Objective 2. Evaluate methods for including AFSC and NWFSC survey time series in "full" stock assessments.

Workshop participants generally agreed that the triennial and NWFSC Shelf-slope "expanded" surveys are different time series and should be included separately in assessments, based on the analyses presented for canary rockfish, English sole, darkblotched rockfish and arrowtooth flounder. This conclusion was based on the fundamental differences in survey protocols and performance. Stock assessment authors may explore alternative use or combinations of the surveys. Alternative options for including the NWFSC "expanded" survey are outlined below.

In general, two options were discussed for using the NWFSC "expanded" survey data in assessments for species which primarily occur on the slope (e.g. darkblotched rockfish). The first option is to continue using the NMFS conducted slope survey time series (>100 fm) as in previous assessments, and add data from the recently sampled shelf depths (<100 fm) of the NWFSC "expanded" survey as a new and separate time series. Although this approach may represent a viable interim method for including the new data, as it preserves a longer continuous slope time series, participants generally thought this method is not a long term solution. As the length of the "expanded" survey time series increases, information and statistical power may be lost by separating data from the "expanded" survey into two concurrent time series Also, since the NWFSC survey was not extended to the Mexican border until 2003, a slope time series from 1998 to 2006 would reflect very different geographic coverage. In order to maintain geographic consistency over this time period, data from the Conception INPFC area would need to be excluded from the derivation of a survey index.

The second suggested option for species occurring primarily on the slope, involves including two separate time periods for the NWFSC survey, based on the change in depth coverage (i.e. NWFSC slope (1998-2002) and NWFSC "expanded" slope/shelf (2003-06). Participants noted that if authors are going to include the "expanded slope survey" as new time series, they will need to make sure that the selectivities make sense relative to the first NMFS slope survey.

Three options were explored to include the NMFS triennial shelf survey and the NWFSC "expanded" shelf-slope survey into assessments for species primarily occurring in shelf depths. The first option, agreed by participants as the "default method", includes using both surveys as separate time series with different catchabilities and selectivities. Participants also discussed options for combining the surveys into one time series. If

authors choose to combine the surveys they should explore setting "Q" and selectivity the same as well as estimating different "Q"s and equal selectivities.

Case studies were presented for three "full" assessments that will be conducted during the 2007 stock assessment cycle. Dr. Ian Stewart presented the canary rockfish case study, Dr. Isaac Kaplan presented preliminary work on arrowtooth flounder, and Dr. Owen Hamel presented the darkblotched rockfish case study.

Canary rockfish

Workshop participants recommended retaining the NMFS triennial shelf and NWFSC "expanded" shelf-slope surveys as separate indices due to a number of factors. Foremost among these are the substantial differences in the numeric and spatial properties of catch between the two surveys. In addition, differences in survey design and protocol, estimated Q, and length frequencies cannot be captured in the assessment model if the two surveys are combined into one index.

The observed survey catch rate of canary rockfish per unit effort has been variable, and typically includes a small number of large tows. The NWFSC survey 2003-2005 has caught canary rockfish in a smaller proportion of the total tows (0.12 compared to the triennial 0.18) but positive catch rates tend to be larger (mean log (CPUE) = 0.78) and more variable (SD of mean log CPUE = 1.68) than those observed in the triennial survey time series (mean log (CPUE) = -0.095, SD 1.28). Further, many more positive tows south of San Francisco Bay have been observed in the NWFSC survey. When analyzed in numbers of juveniles (those that are less than the length at 50% maturity) the difference between surveys throughout this area is even more pronounced. Many more small (< 30cm) canary rockfish are collected in the NWFSC survey, even in 2004 when both surveys were performed nearly simultaneously. Although survey design has varied, the cause of this difference is unknown.

Design-based estimators of biomass are very sensitive to the largest NWFSC catches in 2004 and 2005, with changes in the total on the order of +/-50% when the single largest tow was removed. GLMM-based estimators are much more robust to these tows, due to a more appropriate characterization of the error structure of positive catches and the explicit estimation of the fraction of hauls catching zero canary rockfish. The GLMM approach examined resulted in lower biomass estimates for all years, but less inter-annual variability. A similar pattern was observed for GLMM-based biomass estimates derived from triennial survey data.

Selectivity patterns estimated in preliminary model runs were markedly different (dome-shaped for the Triennial survey and asymptotic for the NWFSC survey), although the change in likelihood was modest (~ 6 units NLL for 7 selectivity parameters with age data not included). Both GLMM and design-based estimators showed similar selectivity and catchability estimates.

Arrowtooth flounder

Arrowtooth flounder catch rates and distributions appeared similar in both the NMFS triennial survey and the NWFSC "expanded" shelf-slope survey. Therefore, the authors will cautiously explore combining them into one time series, rather than treating the NWFSC "expanded" shelf-slope survey as a separate short time series. Since the development of this essentially new assessment was in the very early stages at the time of the workshop, differences in survey catchability and selectivity and estimated biomass trajectories associated with alternative methods for including data from the two surveys were not presented. However, catch rates and length frequencies in the two surveyswere reviewed.

Data for arrowtooth flounder were only available for one year (2004) from both the triennial survey and the NWFSC "expanded" shelf-slope survey. Given the limited data for arrowtooth flounder, it is not clear if there is sufficient statistical power to detect differences between the two surveys for this species. A comparison of catch per unit effort (kg/hectacre) of hauls containing arrowtooth flounder revealed no significant difference between the two surveys in 2004. Data from the two time series (2003-2004 NWFSC "expanded" shelf-slope survey and 1980-2004 triennial survey) were also compared, and in both surveys peak abundances are found near a depth of 200m and at the northern limit of the surveys. Average fish weight (kg/fish) increases with depth (Figure 1) in both surveys and the length compositions in the two 2004 surveys are quite similar (Figure 2).

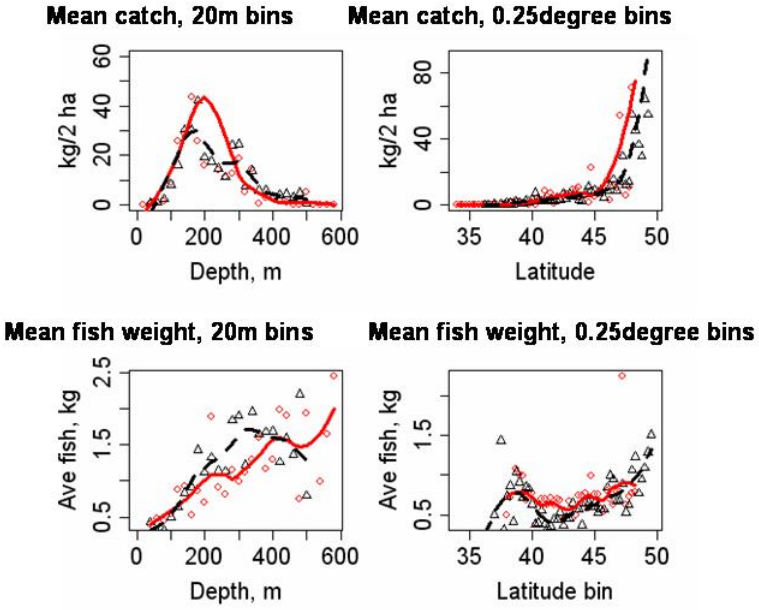

Figure 1. Mean catch and Mean fish weights for arrowtooth flounder for the NWFSC "expanded" shelf-slope survey (2003-2004, solid red line) and triennial survey data (1980-2004, black dashed line).

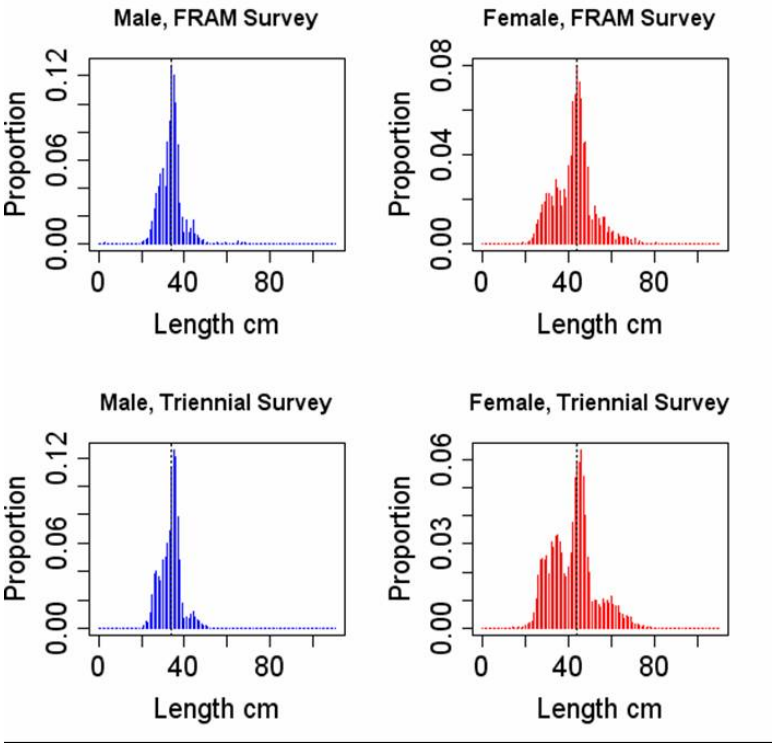

Figure 2. Arrowtooth flounder length compositions collected during 2004 by the FRAM NWFSC "expanded" shelf-slope survey and triennial survey.

Darkblotched rockfish (full assessment)

Workshop participants generally agreed the 2007 darkblotched rockfish assessment should include the shelf (30-100 fathom) portion of the NWFSC "expanded" shelf-slope survey as a new index (with 4 data points). In the future, the "expanded" shelf-slope survey may be used as a single index, with the 1999-2002 portion of the slope survey used as an independent (though related) index.

Relatively larger darkblotched rockfish (lengths between 32-40 cm and ages of 6+years old) were encountered more frequently in the 2003-2005 NWFSC "expanded" shelf-slope survey than in the 1977-2004 Triennial survey. This was primarily due to a few tows in the 2003 and 2005 NWFSC "expanded" shelf-slope surveys which captured large numbers of these larger individuals. Despite this finding, the population as a whole is estimated to have included more fish in that length range in the earlier years of the Triennial survey.

The 2004 NWFSC "expanded" shelf-slope survey (which used 3 boats instead of the customary 4) lacked any of those rare but important darkblotched tows seen in 2003 and 2005 and therefore the length composition of the 2004 NWFSC "expanded" shelf-slope and triennial surveys appear fairly similar. However, the 2004 triennial survey encountered a much larger proportion of 1 year old fish than did the 2004 NWFSC

"expanded" shelf-slope survey. Modeled selectivity for the two surveys reflects this difference in selection for both the smallest and largest fish. If selectivity is forced in the model to be the same between the two surveys, the estimated catchability of the NWFSC "expanded" shelf-slope survey is much higher (nearly 3 times) than that of the triennial survey, and the fit of the model to the data is severely degraded.

Objective 3. Evaluate whether recent data from NWFSC "expanded" shelf-slope survey should be included in update assessments. If they are to be included, should they be treated as a new time series or included as an extension to the time series previously used assessment models?

English sole is scheduled as an "update" assessment in the 2007 assessment cycle. The NWFSC "expanded" survey data will not be included in the update assessment model. Based on the analyses reviewed during the workshop, there was no compelling reason to combine the surveys into one time series. Additionally, there is enough complexity associated with including the NWFSC "expanded" shelf-slope survey data as an expansion of the triennial survey, that the assessment would no longer be considered an "update" as defined by the SSC's Terms of Reference for Stock Assessments and STAR Panels. Fishery catch, age / length data will be included in the update and the analyses produced for this workshop will be included as an appendix in the assessment document.

Workshop participants discussed the inclusion of the NWFSC "expanded" shelf-slope data in other assessments scheduled as updates. Although not all the authors for update assessments attended the meeting, and therefore participants did not see the raw data for other species, it was generally concluded the other update assessments (e.g. widow rockfish) should use the same approach as recommended for the English sole update assessment (i.e. don't use new survey data unless doing a full assessment).

Objective 4. Compare biomass and variance estimates generated using a design-based swept-area approach and model-based (Generalized Linear Mixed Models) approach.

Results from analyzes of the NWFC slope survey using generalized linear mixed models (GLMM) for canary rockfish, English sole (northern and southern regions, and arrowtooth flounder were presented by Dr. Tom Helser. In general, the results suggest that GLMM-based estimators are more robust when catches are comprised of many zero hauls, positive catch rate distributions are skewed (infrequent, very large hauls), and when the assumption of the variance-mean relationship is non-normal. Based on the historical performance of GLMMs and these workshop case studies, participants agreed that the GLMM is the preferred method for developing biomass estimates from survey data for most species. If authors would like to use the GLMM, they are strongly encouraged to evaluate and request the appropriate post stratification for the GLMM by early-March, 2007.

In order to comport with the SSC's Terms of Reference for Stock Assessments and STAR panels, the English sole assessment (and other updates if applicable) should use the design-based estimates for triennial shelf surveys as done in prior full assessments.

Additional Notes

Until the expanded NWFSC survey series contains more observations and has been examined rigorously in assessments, authors should explore a range of possibilities through the use of alternate runs and sensitivity analyses. For stocks that are near a critical level, sensitivity tests, including model likelihoods, point estimates and their uncertainties, and posterior distributions are particularly important. The impact of the choice of data preparation method (GLMM or design-based) should also be presented for review.

Limited case-study analysis revealed a significant degradation in model fit when the triennial and shelf/slope surveys (design-based estimates example) were forced into a single series with a common q and selectivity. This type of analysis should be repeated for other stocks and with the GLMM-based estimates. More analysis should also be conducted to identify the best point estimate for characterizing survey biomass trends among candidates such as the arithmetic mean, the geometric mean, and the mode.

Appendix A. Workshop Participants

Jason Cope, University of Washington (UW)
Owen Hamel, Northwest Fisheries Science Center (NWFSC) and Scientific and Statistical Committee (SSC)
Jim Hastie, NWFSC
Tom Jagielo, Washington Department of Fish and Wildlife (WDFW) and SSC
Isaac Kaplan, NWFSC
Aimee Keller, NWFSC
David King, Alaska Fisheries Science Center (AFSC)
Shirley Lee, NWFSC
Pete Leipzig Fishermen's Marketing Association (FMA)
Jim Likes, Fish and Wildlife Service, Retired
Stacey Miller, NWFSC
Bob Mohn, Center for Independent Experts
Brad Pettinger, Oregon Trawl Commission
Andre Punt, UW and SSC
Victor Simon, NWFSC
Ian Stewart, NWFSC
Theresa Tsou, WDFW
John Wallace, NWFSC
Mark Wilkins, AFSC

Appendix B. NWFSC Bottom Trawl Survey Workshop Agenda

October 31- November 2, 2006

NOAA Western Regional Center
Building 9, Conference Room
Seattle, WA 98115

Tuesday, Oct. 31, 2006

9:00 a.m. Welcome, Review Terms of Reference (TOR), and Introductions

9:30 a.m. TOR #1. Review survey protocols and data collected by the NMFS bottom trawl surveys: AFSC & NWFSC shelf triennial surveys (1977-2004), NWFSC slope survey (1998-2002), and NWFSC shelf-slope survey (2003-2006) and discuss the implications of the differences for use in stock assessments.

11:00 a.m. Coffee Break

11:15 a.m. TOR #2. Evaluate methods for including AFSC and NWFSC bottom trawl survey time series in stock assessments focusing on "shelf" species:

- Ian Stewart – Canary rockfish
- Isaac Kaplan and Tom Helser - Arrowtooth flounder
- Ian Stewart - English sole update

12:30 p.m. Lunch

1:30 p.m Continue Case Study Presentations

3:30 p.m. Coffee Break

4:00 p.m. Discussion

Wednesday, Nov. 1, 2006

9:00 a.m. TOR #2. Evaluate methods for including AFSC and NWFSC bottom trawl survey time series in stock assessments focusing on "shelf-slope" species:

- Owen Hamel - Darkblotched rockfish
- Michael Schirripa - Sablefish
- Owen Hamel - Pacific ocean perch update

12:30 p.m. Lunch

1:30 p.m. TOR #3. Discuss whether recent data from NWFSC shelf-slope survey should be included in update assessments (i.e. English sole) only if they can be treated as a new time series, or whether the new data can be used to extend time series included in previous ssessment models.

3:30 p.m. Coffee Break

4:00 p.m. TOR # 4. Compare biomass and variance estimates generated using a design-based swept-area approach and model-based (Generalized Linear Mixed Models) approach.

- Tom Helser - "Generalized Linear Mixed Model Analysis of the NMFS West Coast Groundfish Bottom Trawl Surveys".

Thursday, November 2, 2006

9:00 a.m. TOR #4 Discussion Continued

10:30 a.m. Summary Wrap-Up

12:00 p.m. Workshop Adjourns

Appendix C. Summary table of Triennial Shelf Survey and NWFSC Shelf-Slope Survey. This table was completed with input from Victor Simon and Aimee Keller (NWFSC) and Mark Wilkins (AFSC).

	AFSC Triennial Shelf	NWFSC Shelf-Slope
Survey Design		
Year range	1977-2004	2003-06
Depth range	1977: 50-250+ fm / 90-460 m 1980-92: 30-200 fm / 55-366 m 1995-2004: 30-275 fm / 55-500 m	30-700 fm / 55–1280 m
Latitudinal range	1977: 34º00'N – US/Canada border 1980-86: 36º48'N - 49º15'N 1986: 36º48'N - US/Canada border 1989-2001: 34º30'N - 49º 40'N	32º 30' - 48º 10' N
Latitudinal stratification	Various: 1977, 1980-83, 1986, 1989-92, 1995-2004	
Station allocation	Transect – track lines are spaced at ~10 nautical mile intervals	Stratified random block
Station selection	Systematic-random design	Randomly selected without replacement
Search time	~120 minutes	60 minutes sequentially for each of 3 cells per station
Depth zones in survey design	30-100 fm / 55-183m 101-200 fm / 184-366m 201-275 fm / 367-500m	30-100 fm / 55-183m 101-300 fm / 184-549m 301–700 fm / 550-1280m
No. of vessels / year	2	4 (in 2004 only 3 vessels were used)
Total number of vessels	16	7
Vessel class	Quite variable in early years (1977-1995): ranged 76 ft-125 ft More recent years (1989-2004): Alaska Class Commercial Trawlers	West Coast Commercial Trawlers
Vessel size	65'-147'	65'-92'
Vessel horsepower	<500-1,710 horsepower	400 - 600 horsepower
Gear/Tow Protocol		
Trawl type	High-opening Nor'Eastern trawl	4-panel Aberdeen-style
Trawl dimension	See diagram	See diagram
Net material	1977-1986: Nylon 1986-2004: Polyethylene	Polyethylene
Mesh size (net)	5 inch	5 ½"
Mesh size (codend)	3.5 inch	5"
Mesh liner	1.25 inch	2"
Headrope	89' (27.2 m)	85'
Footrope	121' (37.4 m)	104'
Roller gear	120' rubber bobbin roller gear, with 14" bobbins with 4" disk	None – solid footrope

	spacers	
Door size and weight	2.1 × 1.5 m steel V-doors weighing approximately 567 kg each	5' × 7' steel V-doors
	AFSC Triennial Shelf	**NWFSC Shelf-slope**
Wire specs	Specifications were not set during early surveys; 5/8 and ¾ inch diameter and 800 m length specifications were set for later surveys	1200 fm of 5/8" steel-core wire rope
Scope	Varies non-linearly with depth. Scope set by skipper in early years and by results of empirical settling experiments since 1992 (95?)	Varies non-linearly with depth
Trawl warps	Tows were made with winch brakes set at wire marks.	
Towing Speed	3.0 ± 0.2 knots (speed over ground)	2.2 ± 0.5 knots (speed over ground)
No. minutes net on bottom	30 minutes	15 minutes
Sensors routinely deployed? (post 1998)	SCANMAR acoustical net mensuration system since 1986. Bathythermograph (since 1992) and bottom contact sensors (since 2001)	Yes
Sampling Protocol		
Sub-sampling protocol	1977- about 1995: Whole-haul sampled catches weighing ~1.2 mt or less Since about 1998: Whole-haul all catches	* See manual
Selection of tows for biological sampling	All	All
Length samples – random or stratified?	Random	Random
Age samples – random or stratified?	Some random, most stratified. Varied by year, species.	Random

Agenda Item E.1.b
NWFSC Report 2
April 2007

A Summary Report from
The WC Groundfish Data/Modeling Workshop
held August 8-10, 2006
in Seattle, Washington

NWFSC, FRAM Division
March 15, 2007

Introduction

The following report summarizes the outcomes and action items from the West Coast Groundfish Data/Modeling Workshop, held August 8-10, 2006 at the NOAA Western Regional Center in Seattle, Washington. This workshop was the first of the "Off-Year" Stock Assessment Improvement Workshops convened during 2006 for the purpose of preparing for the 2007 West Coast groundfish stock assessments. The workshop was held to review available data sources for West Coast groundfish stock assessments, address a number of topics relating to the treatment of data in assessments and other modeling issues, including a review of the features and functionality of the SS2 modeling platform.

Scientists from the Fishery Resource Analysis and Monitoring Division (FRAMD) of the Northwest Fisheries Science Center (NWFSC) organized the workshop. Workshop participants included stock assessment scientists from NOAA Fisheries and State agencies, data managers, fishing industry representatives as well as members of the public.

This report outlines the action items and general areas of agreement reached during the workshop and are reported as bullets. The full list of presenters is outlined in the agenda, included in this report as Appendix A. PowerPoint presentations can be downloaded at ftp://ftp.afsc.noaa.gov/S_Miller/WC_GroundfishDataModelingWorkshop_2006/Data_Modeling_Workshop

Summary of Data Sources

A summary table of available data sources (as updated during workshop) is included in appendix B of this report. This table will be updated with additional data sources as information becomes available. Workshop participants discussed the availability of data as well setting a process for assessment authors to receive data. The general conclusions, areas of agreement and/or action items are outlined below.

- Stock Assessment Coordinator (SAC) will send an announcement to data managers and William Daspit (PacFIN) as a heads up once the list of assessments and STAR panel dates are finalized. This list is also included in this report in appendix C.

- Establish deadlines for receiving data to incorporate into assessments, if possible. Use of data sent to analysts after agreed upon time are up to author's discretion (based on time, etc.) if they can be included in assessments.
- Data managers ask all authors request data early in the process so they have time to plan and respond in a timely manner
- California Sanitation Departments requested one coordinated data request in 2005. Only 2 species (bocaccio and cowcod) may use these data in 2007 assessment cycle. In the future, requests for impingement data should be coordinated.
- If analysts find data in PacFIN are suspicious or incorrect, please send an email to William Daspit. He will work with states to investigate and fix problems.
- PacFIN BDS
    - The BDS is updated at least once per year but may be updated more frequently if States submit new data feeds. Workshop participants agreed it may help to have data uploaded more frequently.
    - William Daspit has scripts for BDS data extraction. Contact him for assistance, if needed.
    - A BDS Summary table is available on line at http://www.psmfc.org/pacfin/bds.html. Data mangers should check these tables now to identify if there are gaps
    - Participants generally agreed we need to move towards getting sablefish and Pacific whiting biological data into PacFIN BDS Tables. More discussion on how to do this took place at PacFIN data committee meeting in November.
- States have committed to updating RecFIN within a month or two. However, assessment authors should still contact State agencies for recreational data because there are some data that aren't housed in RecFIN.
- RecFIN Workshop meeting held in August 2006.

Reconstructions of Domestic Historical Catch

Jim Hastie presented a summary of the variety of approaches used to reconstruct historical domestic catches in previous assessments. The summary focused on capturing authors' decisions for time periods, areas, or fleets where available landings reports do not identify the species of concern.

- Workshop participants generally agreed a need exists to have a comprehensive reconstruction of catch on a state by state basis.
- The NWFSC will explore having the PSMFC [historical data book] keypunched.

Methods for Preprocessing Assessment Data:

Owen Hamel presented a summary of methods employed to construct age and length compositions during the 2005 assessments. Three approaches were generally used to construct length compositions however, many assessments did not adequately document the methods used. Other issues including choices made regarding stratifications, use of "super years", aggregate market categories, accounting for species mis-identification, and filling in missing data were also discussed.

- Participants generally agreed that better documentation of the methods analysts used to construct age- and length-compositional data is needed. Many 2005 assessments didn't include any details on methods for creating age/length comps.
- Workshop participants agreed a need exists to investigate optimal binning of composition data (i.e. coarse vs. fine). This should be added to the "long-term wish list" or considered a "special project".

Historic Groundfish Age Reading

Recent assessments have identified anomalies in historic size-at-age observations for several important species. These could be due to either changes in growth or changes in otolith reading techniques. It is critical to determine as best as possible which of these two explanations is most likely as each is modeled differently within the assessment. In an effort to address these issues, Michael Schirripa outlined the data flow between West Coast ageing laboratories and PacFIN's Biological Data System (BDS), reviewed current fields in PacFIN's BDS, and suggested adding meta-data regarding who, when, and where age estimates have been produced.

- Workshop participants discussed how the meta-data recorded by some readers are not being carried forward into the State's databases and onto the PacFIN database. This information would be helpful especially since different ageing laboratories read structures from the same species. Michael Schirripa will poll authors to find out which fields are most valuable to include as meta-data. Current suggestions include date aged, readers' initials, laboratory, reading method and method for choosing sub-samples to age.
- Once meta-data fields are identified, a formal request should be sent to William Daspit. William will forward the request to the States and work with them so that this information can be included in PacFIN.
- Creation of an electronic record of historic ages, including what was read, by whom, and the method used, was discussed. This may be a project for the off-year production ageing cycle (2007). If the assessment community thinks this is an important project, the States can be requested to resurrect records and keypunch the data.
- Port samplers should send collected otoliths to ageing labs more frequently than once per year in order to permit improved ageing-lab planning for the timely delivery of data.
- A need exists for a Coast-wide Biological Data Coordinator to act as liaison between port samplers and assessment analysts.

GLMM Analysis for Triennial Shelf Survey Data

Tom Helser presented a review of General Linear Mixed Model (GLMM) theory, its application to survey data, in particular, the west coast groundfish bottom trawl surveys, and showed results from a preliminary analysis for canary rockfish.

- Workshop participants were generally interested in using the GLMM and agreed to discuss this topic in more detail during the NWFSC Bottom Trawl Survey workshop held in October, 2006.

- Workshop participants suggested that Tom 1) conduct simulations of GLMM vs. swept area biomass estimates, 2) explore the appropriateness of mean vs median point estimates, and 3) explore where to draw depth boundaries.

Stock Assessment and STAR Panel TOR

Martin Dorn presented a review of the Scientific and Statistical Committee's Terms of Reference for Stock Assessments and Stock Assessment Review (STAR) panels, as well as few issues discussed during the Groundfish Stock Assessment Review Workshop in January, 2006.

- Phase Plots should use F not SPR. For models with multiple fleets, Martin Dorn (SSC) suggested calculating a global F using: Total Catch / Summary Biomass. Some workshop participants have concerns about the accuracy of this calculation.
- Guidance is needed from the Council family on whether there is a desire to have briefings of assessment results and if it is preferred to have assessment authors (or SSC STAR panel chair) provide the briefing. Expectations regarding assessment author attendance at Council meetings when the SSC review will occur and when Council action will be taken should be clarified.
- Mechanisms (can be formal or informal) for involving / consulting GAP representatives (and industry) on data use and issues in upcoming assessments should be documented by assessment authors. It is up to the discretion of analysts if they want/need to pursue formal or informal avenues of "consultation". The NWFSC will be holding pre-assessment workshops for NWFSC-sponsored assessments. It may be possible to include other species if analysts are interested in participating in those meetings. Note: there was concern expressed for the need of a mechanism to facilitate this process if it is formalized.
- The Port Liaison Project (PLP) is working to get interested members of industry in touch with stock assessment analysts. Pete Leipzig has more information if people are interested.

Effective Sample Size

Xi He presented the results of a simulation experiment designed to look at the role of weighting in the Widow rockfish stock assessment (a non-SS2, ADMB-programmed model).

Ian Stewart and Stacey Miller presented a summary of issues surrounding the weighting of compositional data, tuning of input sample sizes, and a new method for specifying input sample sizes based on an analysis of effective sample sizes observed in 2005 stock assessments. The presentation included:

- Discussion of likelihood options used in stock assessment was presented along with some caveats particular to the multinomial which is used in SS2.
- A summary of the highly varied methods for calculating and iterating (or not) input sample sizes was presented for 17 stock assessments conducted in 2005, drawing the conclusion that use of a standardized approach would add consistency and objectivity.

- The potential problems with 'untuned' weightings where input sample size differed substantially from effective sample size were outlined, with emphasis on those cases where input sample sizes were much larger than effective sample sizes. Across all 2005 assessments, the input sample size for most fleets were either tuned to be very close to effective sample size (33%), or allowed to be somewhat smaller (50%), with only 17% remaining much larger than effective values.
- Because effective sample size might logically be a function of both the number of fish sampled as well as the number of trips sampled, a relationship was developed to relate the effective sample size observed in the stock assessment to these metrics of the raw data. Survey and fishery data were separated.
- Fitted parameter values were reported which allow assessment authors to calculate initial input sample sizes that would: 1) retain sampling heterogeneity among years, 2) recognize the differences in sample sizes between commercial trips and survey hauls, and 3) not require subjective weighting and be expected to need less iteration than other methods.
- Workshop participants generally agreed the approach was promising, and should be explored in the next round of assessments. Use of harmonic mean effective sample size could be considered instead of arithmetic mean. Further review of the use of the multinomial likelihood might also be valuable.
- Authors can contact Ian at: Ian.Stewart@noaa.gov, for a copy of the presentation with parameter values or assistance in applying this method.

Tuning

EJ Dick presented a work-in-progress designed to improve the standardization of pre-recruit catch to a fixed age and to capture the uncertainty in this standardization. He presented a linear hierarchical approach, drawing strength of inference from examination of multiple years years and species. He provided examples that indicated this method might be a desirable alternative to the small sample sizes available for many species in some years.

- Workshop participants generally agreed that this method was promising and should be developed further.

Stock Synthesis 2 (SS2)

Dr. Richard Methot reviewed some of the new features in Stock Synthesis 2 (SS2) and workshop participants provided comments and suggestions for additions. Rick will unveil the added features during a SS2 workshop February 27-28, 2007 in Seattle, Washington. Please contact Rick for more information.

R Software for Model Diagnostics and Plotting of SS2 Output

Ian Stewart presented a tool for quickly summarizing the results of a Stock Synthesis 2 (SS2) model run. Using the free software "R" (www.r-project.org), five SS2 output files are condensed into a short list of statistics and a number of plots with one function call. This enables quick and easy evaluation of all aspects of a model run during exploratory development. Many plots are suitable for document preparation, including those specifically required by the Scientific and Statistical Committee's stock assessment terms

of reference. "Value added" features include scanning of the .cor file, parameter and model convergence metrics, as well as traps for common errors and issues specific to SS2. Some examples were presented. This function is generalized for most SS2 option configurations and has been tested on a number of files.

- Workshop participants generally agreed that improved integration of tools like this will facilitate consistent reporting of detailed results among authors as well as rapid presentation and electronic reporting during STAR panels.
- Authors can contact Ian at: Ian.Stewart@noaa.gov, for a copy of the software or assistance in using it.

Spatial Scales for Assessments

Rick Methot provided an overview of approaches used to define stock structure and management units for West Coast groundfish including using genetics, demographic patterns and management/assessment units. Steve Ralston presented work on spatial variation in fishing intensity and its effect on yield. Results from his age-structured simulations show that minor to moderate heterogeneity in the spatial distribution of fishing effort has little overall impact on yield. Moderate localized depletions (and surpluses) have only a minor effect on the total yield of the system. However, the ontogenetic stage at which density-dependence is expressed (i.e., pre- or post-settlement) has a marked influence on sustainable yield.

Jason Cope presented preliminary work to identify stock structure using commonly collected data (catch per unit effort; CPUE) and simple clustering techniques. Comparison of the spatially-resolved CPUE to the CPUE assumed under a hypothesis of one coast-wide population revealed important differences in the dynamics of each population. Such differences translate directly into stock assessment and therefore should be recognized. Jason's preliminary work points to the benefits of using clustering techniques that incorporate the uncertainty about each estimated abundance index and the need for further exploration into methods of incorporating small-scale abundance measures into assessments at larger scales.

Priors

A summary of the priors used in 2005 assessments (compiled by Laura Bozzi (PFMC) and John Field (NMFS)) was presented and discussed. This table is included in Appendix B. Owen Hamel presented preliminary work on prediction intervals for natural mortality (M), using arrowtooth flounder and darkblotched rockfish as examples. Xi He followed by presenting a method to calculate priors for Beverton-Holt stock-recruitment steepness, which included reduced probabilities of low values of steepness due to the evolutionary persistence principle.

- Participants generally agreed that it would be worthwhile to investigate creating priors or profiling ranges for natural mortality rate (M) using prediction intervals derived from data sets relating M to maximum observed lifespan, von Bertalanffy K, gonadosomatic index (GSI), or other life history parameters.

Appendix A. Workshop Agenda

West Coast Groundfish Data / Modeling Workshop

August 8-10, 2006

NOAA Western Regional Center
Traynor Seminar Room
Building 4, Room 2076
Seattle, WA 98115

Tuesday, August 8, 2006

8:15 a.m. - 8:30 a.m. Coffee and greetings
8:30 a.m. - 9:00 a.m. Introductions / Workshop Overview

Discussion Topic: Review Available Data Sources
9:00 a.m.–10:30 a.m.

- Presentation: Summary of available data including points of contact and dates when data will be available (Stacey Miller)
- Discussion Items:
  1) Are there known data gaps in various databases?
  2) How should the GMT's scorecard be used?
  3) Author access to data sources

10:30 a.m. - 10:45 a.m. Coffee Break

Discussion Topic: Reconstructing Historical Catches
10:45 a.m. – 12:00 p.m.

- Presentation: Summary of approaches used in the 2005 assessments (Jim Hastie)
- Discussion Items:
  1) Are the methods used to reconstruct catch series consistent across similar species? If not, can we suggest improvements or projects to facilitate greater consistency?
  2) When should discards be estimated within the model vs. outside the model?

12:00p.m. – 1:00 p.m. Lunch

Discussion Topic: Methods for Pre-Processing Assessment Data
1:00 p.m. – 4:45 p.m. Age and Length Comps

- Presentation: Summary of methods employed to construct age/length compositions during the 2005 assessments (Owen Hamel)
- Presentation: Overview of historical groundfish age reading (Michael Schirripa)
- Presentation: How to use data from multiple readers when constructing ageing error matrices (Rick Methot)
- Presentation: To GLM or Not to GLM (Tom Helser)
- Discussion Item:
  1) Can we develop guidelines for pre-processing age/length data?
  2) Preliminary discussion on constructing survey age and length compositions using GLM-based analyses. A follow-up discussion will take place at the bottom trawl survey workshop.

4:45 p.m. – 5:00 p.m. Public Comment

Wednesday, August 9, 2006

Discussion Topic: Stock Assessment and STAR Panel Terms of Reference

8:30 a.m. – 9:00 a.m. Overview of the terms of reference for the 2007 Stock Assessments and STAR Panels including reporting of SS2 generated summary statistics (Martin Dorn)

Discussion Topic: Effective Sample Size

9:00 a.m. – 10:30 a.m.

- Presentation: Overfitting compositional data relative to surveys (Xi He)
- Presentation: Fish, samples and assumptions: Logical and objective weighting for length and age frequency data (Ian Stewart)
- Discussion Items:
  1) Can we develop guidelines for treating effective sample sizes?

10:30 a.m. - 10:45 a.m. Coffee Break

Discussion Topic: Uncertainty in Tuning Indices

10:45 a.m. – 12:00 pm

- Presentation: An overview of SWFSC's attempt to express uncertainty in the Santa Cruz pre-recruit index using a Bayesian hierarchical linear modeling (EJ Dick)
- Discussion Item:
  1) Treatment of uncertainty in tuning indices

12:00 p.m. – 1:00 p.m. Lunch

Discussion Topic: Stock Synthesis 2 (SS2)

1:00 p.m. – 5:00 p.m. Review of the features and functionality of the SS2 modeling platform, with emphasis on the improvements since 2005 (Rick Methot)

Thursday, August 10, 2006

Discussion Topic: Stock Synthesis 2 (SS2)

8:30 a.m. -10:30 a.m. SS2 Discussion Continued

- Presentation: R software for model diagnostics and plotting of SS2 output (Ian Stewart)

10:30 a.m. – 10:45 a.m. Coffee Break

Discussion Topic: Appropriate Spatial Scales for Assessments

10:45 a.m. – 12:00 p.m.

- Presentation: Come together or break away: Addressing spatial issues in standardizing indices of abundance for near shore species (Jason Cope)
- Presentation: Stock structure and management units for West Coast groundfish (Rick Methot)
- Presentation: Spatial variation in fishing effort (Steve Ralston)
- Discussion Items:
  1) Have approaches in defining spatial scales for assessment been consistent? If not, can guidelines be developed for defining spatial scales.

12:00 p.m. – 1:00 p.m. Lunch

Discussion Topic: Priors

1:00 p.m. – 2:30 p.m.

- Presentation: Summary of priors used in 2005 Assessments
- Presentation: M and GSI: Prediction Intervals (Owen Hamel)
- Presentation: A prior for steepness in stock-recruitment relationships, based on an evolutionary persistence principle (Xi He)
- Discussion Items:
  1) Dealing with uncertainty in parameter values (use of priors)

Discussion Topic: Wrap-Up Session

2:30 p.m. General Wrap-Up / Workshop Agreements

5:00 p.m. Workshop Adjourns

APPENDIX B. Summary Tables Presented During Workshop

Table 1. Summary of Data Sources and Points of Contact for West Coast Groundfish Stock Assessments. Table compiled by Stacey Miller (NMFS).

Data Source	Years	Data Type	Contacts	Contact Email	Notes
NWFSC Survey	1998-2006	Questions on Data / Raw Data	Beth Horness	Beth.Horness@noaa.gov	NA
NWFSC Survey	1998-2006	Traditional Area-Swept Biomass Estimates	Beth Horness	Beth.Horness@noaa.gov	1998-2005 data are available 2006 data avail. Mid-February
NWFSC Survey	1998-2006	Traditional (Design-based) Length Comps	Beth Horness	Beth.Horness@noaa.gov	1998-2005 data are available 2006 data avail. Mid-February
NWFSC Survey	1998-2006	GLMM-Based Biomass Estimates	Tom Helser	Thomas.Helser@noaa.gov	Authors interested in using GLMM need to contact Tom to discuss stratification
Triennial Shelf Survey	2004	Questions on Data / Raw Data	Beth Horness	Beth.Horness@noaa.gov	NA
Triennial Shelf Survey	1977-2004	Traditional Area-Swept Biomass Estimates and Length Comps	Mark Wilkins	Mark.Wilkins@noaa.gov	Mark has already provided estimates and size comps for interested analysts. Beth Horness has copies of the traditional area-swept biomass estimates
AFSC Slope Survey	1990*-2001	GLMM-Based Biomass Estimates	Tom Helser	Thomas.Helser@noaa.gov	
Santa Cruz Pre-Recruit Survey	1983-2006	Pre-recruit Index	Steve Ralston	Steve.Ralston@noaa.gov	
PWCC/NWFSC Pre-Recruit Survey	2001-2006	Pre-recruit Index	Vidar Wespestad (PWCC) or Elizabeth Clarke (NMFS)	vidarw@verizon.net or Elizabeth.Clarke@noaa.gov	

Data Source	Years	Data Type	Contacts	Contact Email	Notes
RecFIN	1980-2006		Wade Van Buskirk	wade@psmfc.org	Comprehens recreational catch
OR Sport Data	1980-2006	See Oregon Data Sources / POC	Don Bodenmiller	Don.Bodenmiller@oregonstate.edu	
WA Ocean Sampling Program			Farron Wallace	wallafrw@dfw.wa.gov	
CDFG CPFV trip-specific logbook	1980-Present		Jana Robertson		
CDFG CPFV Historical Logbook Data			Kevin Hill	Kevin.Hill@noaa.gov	
Northern/Central CA Onboard Data Collection Program			Deb Wilson-Vandenberg	dwilsonv@dfg.ca.gov	
Southern CA Onboard Data Collection Program			CDF&G		
PacFIN	1981-Present	Commercial landings and biological sample data for WA, OR, CA	William Daspit	william_daspit@psmfc.org	BDS Summary Tables available online - updated when new data are uploaded
GMT Scorecard	2006	2006 Projected Total Mortality for Overfished Stocks	John DeVore	John.Devore@noaa.gov	Finalized at GM's Feb or March meeting
CalCOM	Pre-1981	CA Biological Data	Don Pearson	Don.Pearson@noaa.gov	
West Coast Groundfish Observer Program	2001-2005	Discard rates	Jim Hastie / Cameron Hagstrom	Jim.Hastie@noaa.gov or Cameron.Hagstrom@noaa.go	March 2007

Data Source	Years	Data Type	Contacts	Contact Email	Notes
West Coast Groundfish Observer Program	2001-2005	Length / Age Comps & Mean Weights	Jim Hastie / Cameron Hagstrom	Jim.Hastie@noaa.gov or Cameron.Hagstrom@noaa.go	March 2007
West Coast Groundfish Observer Program	2003-Present	Questions on data collection / program	Janell Majewski	Janell.Majewski@noaa.gov	NA
OR Shoreside Hake		Biological samples reside in Newport - Not PacFIN	Primary: Lori Jesse Secondary: Mark Saelens		
At-Sea Hake Observer	1991-Present	Bycatch weights and counts	Vanessa Tuttle	Vanessa.Tuttle@noaa.gov	Data are updated frequently during fishing season (opens mid-May)
At-Sea Hake Observer	2003-Present	Bycatch sexed lengths and ages	Vanessa Tuttle	Vanessa.Tuttle@noaa.gov	Data are updated frequently during fishing season (opens mid-May)
Edison S. Cal.			Kevin Herbison		Impingement data
Submersible surveys		Washington areas (WDFW) California areas (SWFSC)	Tom Jagielo Mary Yoklavich	jagiethj@dfw.wa.gov Mary.Yoklavich@noaa.gov	
S California Hook and line survey			John Harms	John.Harms@noaa.gov	
IPHC Hook and line			Claude Dykstra		

Table 2. Summary of Priors Used in 2005 West Coast Groundfish Stock Assessments. Compiled by Laura Bozzi (PFMC) and John Field (NMFS)

Species	Steepness of S/R curve (h)		Sigma R*		von-Bertalanffy growth coefficient (K)		Natural Mortality (M)	
	value	method	value	method	females	males	females	males
Blackgill rockfish	0.65	fixed	0.5	fixed	0.068	0.04	0.04	0.04
Bocaccio rockfish	0.21	estimated	1	fixed	0.19	0.21	0.15	0.15
Cabezon	0.7	fixed	1	fixed	0.2	0.2	0.25	0.3
California scorpionfish	0.7	estimated	1	fixed	0.13	0.12	0.25	0.25
Canary rockfish	0.32	estimated	0.4	fixed	0.14	0.175	0.06 (young) 0.09 (old)	0.06
Cowcod	0.5	fixed	0	deterministic	0.06	0.06	0.055	0.055
Darkblotched rockfish	0.95	fixed	0.83	iterated	0.2	0.25	0.07	0.07
Dover sole	0.8	fixed	0.35	fixed	0.1189	0.0732	0.09	0.09
English sole	0.83	estimated	0.36	iterated	0.23-0.40 a/	0.28-0.48 a/	0.26	0.26
Gopher rockfish	0.65	fixed	0.5	fixed	0.186	0.186	0.2	0.2
Lingcod	0.9	fixed	1	fixed	LCN: 0.104 LCS: 0.145	LCN: 0.149 LCS: 0.223	0.18	0.32
Longspine thornyhead	0.75	fixed	0.6	fixed	0.064	0.064	0.06	0.06
Kelp greenling	0.7	fixed	1	foxed	0.3 c/	0.4 /c	0.26	0.26
Pacific whiting	0.75	fixed	1.13	iterated	0.33	0.33	0.23	0.23
Pacific Ocean perch	0.55	estimated	1	fixed	N/A b/	N/A b/	0.051	0.051
Petrale sole	North: 0.88 South 0.72	estimated	North: 0.50 South: 0.46	iterated	0.08	0.08	0.2	0.2
Sablefish	0.34	est. with prior	0.68	iterated	0.246	0.298	est. with prior	est. with prior
Shortspine thornyhead	0.6	fixed	0.5	fixed	0.018	0.018	0.05	0.05
Starry flounder	0.8	fixed	1	fixed	0.251	0.426	0.3	0.45
Widow rockfish	0.28	estimated	0.5	fixed	North: 0.14 South: 0.2	North: 018 South: 0.25	0.125	0.125
Yelloweye rockfish	0.44	fixed	0.5	fixed	0.0664	0.0664	0.036	0.036
Yellowtail rockfish	N/A	N/A	N/A	N/A	0.07-0.23	0.08-0.25	0.11-0.28	0.11

Appendix C. 2007 West Coast Groundfish STAR Panel Schedule

Stock	Assessment	Lead Author(s)	2007 STAR Panel Dates
Pacific hake/whiting	Full	Tom Helser & Steve Martell	Feb. 5-9
Longnose skate	Full	Vlada Gertseva	May 7-11
Sablefish	Full	Michael Schirripa	May 7-11
Black rockfish (N&S)	Full	David Sampson & Farron Wallace	May 21-25
Blue rockfish (Calif)	Full	Meish Key	May 21-25
Bocaccio	Full	Alec MacCall & Steve Ralston	June 25-29
Chilipepper rockfish	Full	John Field	June 25-29
Darkblotched rockfish	Full	Owen Hamel	July 16-20
Canary rockfish	Full	Ian Stewart	July 30-Aug. 3
Arrowtooth flounder	Full	Isaac Kaplan & Tom Helser	July 30-Aug. 3
Yelloweye rockfish	Update	John Wallace	June 11-13
English sole	Update	Ian Stewart	June 11-13
Pacific ocean perch	Update	Owen Hamel	June 11-13
Cowcod	Update	EJ Dick and Steve Ralston	June 11-13
Widow rockfish	Update	Xi He	June 11-13

Agenda Item E.1.b

Supplemental NWFSC PowerPoint

April 2007

West Coast Groundfish Observer Program

Current data release schedule and a possible alternative schedule

Current observer data schedule (GIPC)

	Complete by:					2008
2007	1-Aug	Sep	1-Oct	1-Nov	Dec	Jan
Data release type:						
LE Trawl bycatch and discard rates	QA/QC Data May06-Apr07		Post data report	Update bycatch models with data		
LE Sablefish fixed gear bycatch and discard rates	QA/QC Data Apr06-Oct06		Post data report	Update bycatch models with data		
LE DTL fixed-gear bycatch and discard rates	QA/QC Data May06-Apr07		Post data report	Update bycatch models with data		
Nearshore fishery bycatch and discard rates	QA/QC Data May06-Apr07		Post data report	Update bycatch models with data		
Total Mortality 2006						Post report

Alternative possible observer data schedule

	Complete by:					2009
2008	1-Apr	1-May	1-Jun	1-Oct	1-Nov	Jan
Data release type:						
LE Trawl bycatch and discard rates	QA/QC Data May07-Dec07	Post data report	Update bycatch models with data	QA/QC Data Jan08-Jun08	Post data report	Update bycatch models with data
LE Sablefish fixed gear bycatch and discard rates	QA/QC Data Apr07-Oct07	Post data report	Update bycatch models with data			
LE DTL fixed gear bycatch and discard rates	QA/QC Data May07-Dec07	Post data report	Update bycatch models with data			
Nearshore fishery bycatch and discard rates	QA/QC Data May07-Dec07	Post data report	Update bycatch models with data	QA/QC Data Jan08-Jun08	Post data report	Update bycatch models with data
Total Mortality 2007					Post report	

Agenda Item E.1.b
Supplemental NWFSC Report 3
April 2007

Pre-Recruit Survey Workshop

September 13-15, 2006

Southwest Fisheries Science Center

Santa Cruz, California

A Summary Report Prepared by:

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Executive Summary

In 1983 the Southwest Fisheries Science Center (SWFSC) initiated a midwater trawl survey to collect data on, among other things, the abundance and distribution of young-of-the-year (pre-recruit) groundfish, including especially rockfishes of the genus *Sebastes*. Through 2003 this survey was narrowly focused in an area off the coast of central California from lat. 36º30'– 38º20' N. In 2001 a new pre-recruit survey conducted cooperatively by the Northwest Fisheries Science Center (NWFSC) and the Pacific Whiting Conservation Cooperative (PWCC) was initiated, with the primary intent of monitoring young-of-the-year Pacific whiting abundance. The initial coverage of this survey ranged from lat. 35º00' N (just south of Morro Bay CA) to lat. 45º00' N (just north of Newport OR). Beginning in 2004, the geographic extent of both surveys was expanded, so that by 2005, the combined area of both surveys covered the entire U. S. west coast, from the Canadian to Mexican borders (lat. 33 º00'– 48 º00' N).

A workshop focusing on the integration of data from these two pre-recruit surveys in west coast groundfish stock assessments was held September 13-15, 2006 at the SWFSC facility in Santa Cruz, CA. The workshop was organized and moderated by Steve Ralston (SWFSC) and Jim Hastie (NWFSC), with substantial organizational and logistical support from Stacey Miller and Shirley Lee (NWFSC) and Jacki Davis (SWFSC).

Workshop Organization and Objectives

The workshop was attended by over 20 people, including individuals involved in conducting both pre-recruit surveys, stock assessment scientists, and the public. The workshop was structured as an informal series of presentations and discussions focusing on two primary and two secondary questions.

The two primary questions addressed by the workshop were:

1. Can survey data collected by the **R/V David Starr Jordan** (SWFSC) and the **F/V Excalibur** (PWCC/NWFSC) be combined into single coast-wide indices of Pacific whiting and rockfish pre-recruit abundance?

2. Is a power transformation an acceptable way of modeling non-linearity in early life history processes and, if not, what other analytical techniques are more appropriate?

Two questions of secondary importance were:

3. What processes (e.g., density-dependent mortality, measurement error) affect the relationship between survey indices of pre-recruit abundance and model estimates of recruitment?

4. How influential are pre-recruit survey data on: (a) estimated historical times series of stock abundance and (b) projections of near term future abundance? Related to this, how can the informational value of a pre-recruit survey to a stock assessment be evaluated?

Twelve scheduled presentations were organized into three sessions (agenda attached as Appendix 1):

Session 1. Developing a Coast-wide Survey of Groundfish Pre-Recruit Abundance
Session 2: Incorporating Pre-Recruit Indices in Stock Assessments
Session 3: Case Studies

Each session included opportunities for discussion based on individual presentations and for identification of emergent areas of participant agreement relating to the focal questions of the workshop. Additionally, the overall themes of the workshop were discussed by participants in a wrap-up session.

Workshop Areas of General Agreement

Throughout the course of the workshop's discussions, several findings and suggestions for future surveys, research, and/or applications were broadly supported by participants. With respect to question #1 (see above) participants concluded the following:

1. For species that are distributed exclusively or predominantly north of Point Conception, data from the 2001-06 combined surveys provide acceptable spatial coverage for creating a coast-wide index. The combined spatial coverage during 2004-06 is reasonable for all species, including those with substantial catches taken south of Point Conception. However, the spatial coverage of the SWFSC survey during the 1983-2000 period is largely inadequate to index pre-recruit abundance for most species, particularly where coastwide assessment areas are used in population modeling. However, future research may identify oceanographic covariates that may explain the distribution of young-of-the-year groundfish within and outside of the core SWFSC survey area. This may increase the value of this longer time series for assessing a broader array of species. The core SWFSC survey area appears to represent the preponderance of the distribution of a few species reasonably well (e.g., chilipepper), but may also prove useful in region-specific modeling for other stocks that have a more coast-wide distribution (e.g., widow rockfish).

2. Comparison of methods and patterns in catch rates currently indicate that the SWFSC and PWCC/NWFSC surveys are sufficiently similar that data from the two surveys can be combined to form a single pre-recruit index over the area covered. However:
    a. Detailed and more rigorous statistical comparisons of paired trawl observations should continue.
    b. The two surveys should continue to be executed with substantial spatial overlap, though perhaps less than at present, with as many proximate (paired) trawls as feasible in the overlapping region.
    c. To the extent practicable, the number of within-year (time-separated) replicate tows at specific locations should be increased, in order to assess the effect of survey timing (calendar day) on catch rate. Data from monthly trawls conducted by the NWFSC's Newport facility may provide insight regarding the availability of young-of-the-year groundfish to the NWFSC/PWCC survey.

d. Further analysis should be conducted of survey comparability relating to differences in station depth. Ideally, both surveys should use the same site depth/dispersion protocols, but tradeoffs should be better understood before protocols of either survey are changed. Post-stratification of the data by depth and latitudinal bins may be an effective way to accomplish this.

3. In the future, an effort should be made to determine to what extent under-counting of rockfish adhering to large discarded objects (e.g., jellyfish) in PWCC/NWFSC trawls may have contributed to inter-survey differences in catch at proximate tow locations.

4. Existing data from (time-separated) replicate tows in the SWFSC data should be analyzed to assess the potential magnitude of variance and bias effects associated with varying numbers of replicate tows.

5. More effort should be directed towards developing an error budget for the surveys, i.e., inventorying possible sources of variance and what we know about them. This exercise could provide useful guidance when tuning pre-recruit survey indices in assessment models.

6. Alternative General Linear Model (GLM) formulations should be explored for developing pre-recruit abundance indices. In particular, the potential benefits of replacing sampling stations with broader latitudinal and depth zones and introducing interaction terms, should be examined. Additionally, mixed-model (GLMM) forms should also be explored, for example, by treating calendar day as a random effect.

7. As more data become available and the development of regional ROMS (Regional Ocean Model System) or other oceanographic models progresses, their outputs may help in identifying the manner in which meso-scale ocean variability affects the abundance and distribution of young-of-the-year groundfish. A better understanding of these relationships may facilitate improvements in pre-recruit survey design or interpretation of results.

Moreover, with respect to question #2 (see above) participants concluded:

1. It was generally agreed that substantial density-dependent compensatory mortality can occur following measurement of pre-recruit abundance at the ontogenetic stage sampled by the surveys (e.g., 100-d). If compensation is substantial, then non-linearity will be introduced in the relationship between “pre-recruit” and “recruit” abundance.

2. When non-linear transformation of an index is considered, the transformation should be conducted internally within the stock assessment model as an explicit part of the estimation procedure.

3. Recent development of a new SS2 option to include an expectation of density-independent pre-recruit abundance may preclude the need for transformation.

Comparative work to evaluate this issue should be performed, with a good candidate being southern widow rockfish.

4. Implementing a stochastic pre-compensation ontogenetic stage (e.g., 100-d) and a subsequent post-compensation stage in SS2 would be a more direct and biologically realistic way of addressing #3 above. However, it is unclear how to deal with the errors-in-variables problem.

5. It is important to evaluate the degree to which non-linear transformation of pre-recruit survey indices is confounded with tuning to the model's RMSE. Transformation and variance inflation should be conducted jointly.

6. The costs and benefits of using pre-recruit survey information in short-term forecasts are asymmetrical, i.e., the costs of "over-fishing" are likely to be substantially greater than the costs of "under-fishing". This asymmetry should be addressed explicitly by management if pre-recruit indices are used for forecasting. This could be accomplished through the use of decision tables or a "precautionary" control rule.

7. The Pacific whiting case study provided a good example of how to proceed in the next hake stock assessment.

Aside from their use in short-term forecasts of impending recruitment, pre-recruit surveys have the potential to provide significant insights into ecosystem dynamics, including:

- monitoring of epipelagic micronekton species diversity
- sensitivity of sampled taxa to high-frequency environmental variation
- monitoring of "small" forage species for use in trophic models
- potential for early detection of regime shifts (e.g., indicator species)
- may provide information useful in retrospective studies of "what happened?"
- sampling is consistent with the ocean observing system (OOS) concept/framework.

Nonetheless, the workshop was not able to definitively answer the question of the survey's utility in forecasting recruitments. The short duration of the "coastwide" survey (2001-06) was considered inadequate to accomplish that goal. Therefore, the surveys should be continued for another 5 years and their ability to provide useful information to recruitment forecasts should be re-evaluated at a future workshop.

Pre-Recruit Survey Workshop: Presentation Summaries

Session 1. Developing a Coast-wide Survey of Groundfish Pre-Recruit Abundance

Long-term variability in abundance of pelagic juvenile rockfishes in central California based on results from the Tiburon/Santa Cruz midwater trawl survey

Stephen Ralston, of the Southwest Fisheries Science Center (SWFSC) in Santa Cruz, opened the workshop by providing a historical overview of the SWFSC Tiburon/Santa Cruz midwater trawl survey. This discussion covered the evolution of the survey's spatial coverage and design, as well as the composition and historic variability of the catch of YOY rockfish in the core, central California survey area, and the methods used in estimating abundance. Every year since 1986, during late spring, the NOAA R/V *David Starr Jordan* has been used to triple-sample roughly 35 fixed stations along latitudinal transects distributed from Pt. Reyes ($38^{o}10'$ N latitude) south to Monterey ($36^{o}35'$ N latitude). Beginning in 2004, the spatial coverage was expanded from Pt. Delgado ($39^{o}50'$ N latitude) south to San Diego ($32^{o}43'$ N latitude). Within the expanded areas of coverage, stations are generally sampled twice, although triple-sampling has been maintained in the core area. Survey trawls are conducted at night for 15 minutes at a speed of 2 knots. A headrope depth of 30 m is maintained, unless bottom depth is 55 m or less, in which case the headrope depth is set at 7 m. Net performance is monitored using Simrad ITI sensors and TDRs. A 3/8" mesh liner is used in the trawl net's codend.

Given its timing, the survey is best-suited for collecting information about winter-spawning rockfish. Shortbelly rockfish (*S. jordani*) has dominated the catch of these species throughout the survey, accounting for more than two-thirds of the YOY rockfish collected. Other important species that are routinely collected in the survey include (in order of amount): chilipepper (*S. goodei*), widow rockfish (*S. entomelas*), squarespot rockfish (*S. hopkinsi*), blue rockfish (*S. mystinus*), canary rockfish (*S. pinniger*), yellowtail rockfish (*S. flavidus*), bocaccio (*S. paucispinis*), stripetail rockfish (*S. saxicola*), and black rockfish (*S. melanops*). However, none of these species comprise more than 10% of the historical rockfish catch. Though these species represent a limited number of all rockfish species found along the coast, they represent a wide array of life histories, ecological niches, and exploitation patterns.

Typically, catch is comprised of individuals that are roughly 150 days old. By this age, for most cohorts, it is very likely that gross-level year-class strength has been established. Survey abundances of yellowtail rockfish, canary rockfish, widow rockfish, bocaccio, and black rockfish are positively correlated, to varying degrees, with cohort recruitment estimates from existing stock assessments for those species. Survey abundance estimates were developed using a Generalized Linear Model (GLM), incorporating year, station, and calendar date effects. Data were treated as sampled from a delta-lognormal distribution, with a binomial probability of positive catch occurrence, and a lognormal distribution of positive catch amounts. The catch of each species was adjusted to a common age (100 days) to account for substantial inter-annual variability in length composition. Across the ten species identified above, year effects exhibited substantial positive correlations, with most pairwise coefficients falling between 0.65 and 0.85. In particular, major El Niño events were associated with low abundance estimates for most species. In a principal components analysis, over 75% of the variation in survey abundance was

accounted for by the first component, which exhibited a strong negative correlation with sea-surface height. Low abundances were generally associated with stronger pole-ward flows in the California current, and high abundances with stronger equator-ward flow. These results provide strong evidence that large-scale spatial and temporal oceanographic phenomena have a major influence on early life-stage rockfish survival and eventual recruitment success.

Bayesian hierarchical methods in estimating the abundance of pelagic juvenile rockfish from survey data

E.J. Dick, of the SWFSC in Santa Cruz, continued the discussion of their survey data and potential methods for modeling abundance. Survey observations for individual species are characterized by a high percentage of zero values, with highly skewed positive distributions. A negative binomial model is not skewed enough to fit these data, and both that approach and other zero-inflated models (e.g., ZIP and ZINB) present challenges in accounting for the adjustment of samples to reflect fish of age 100 days.

The Delta-GLM approach models the age-adjusted data using continuous probability density functions, however, a few issues remain with regard to pre-recruit abundance estimation, and are currently being explored. One of these involves approaches for quantifying uncertainty in the GLM's year effects. A jackknife approach is conceptually simple, but requires the removal of any category containing only 'zero' observations. This is problematic for working with a survey where, for most species, the vast majority of observations are, in fact, zeros. Other approaches might involve estimating indices within assessment models or employing Bayesian methods.

Another issue involves the current modeling assumption that there is no relationship, for a particular species, between the probability of getting a positive tow and the expected amount of catch. For several species, positive correlations are observed between the proportion of positive tows and the mean value of the positive observations. One way of incorporating this relationship would be to allow the information on presence/absence to inform the specification of priors for the positive (e.g. lognormal) portion of the delta-GLM. Since several species of rockfish appear to have highly correlated inter-annual variability and substantial dietary overlap at this life stage, it may also make sense to consider sharing information across species. Linking individual species' GLMs in a Bayesian framework may provide a method for taking better advantage of common patterns among species. Additionally, development of meta-analytic priors using relatively data-rich species may prove particularly beneficial in developing pre-recruit abundance indices for data-poor species.

A comparison of rockfish catches in the SWFSC and PWCC/NWFSC mid-water trawl surveys from 2001-2006

Keith Sakuma, of the SWFSC in Santa Cruz, provided comparisons of both the protocols for implementing the their survey and the newer joint PWCC-NWFSC survey, and survey performance. Temporal and spatial patterns in combined species catch from both surveys were also presented. The annual PWCC-NWFSC survey was initiated in 2001, and has utilized the

F/V *Excalibur* in each year. Both surveys utilize the same gear, sample at the same headrope depth, have similar gear-deployment durations (2.6 vs. 2.8 minutes), and trawl for the same amount of time. Comparison of paired vessel side-by-side trawls conducted from 2002 to 2006 revealed a mean difference in distance trawled between the two vessels of 0.1 km or less in each year. In 2002-03, a substantial difference (121-139 m) in the mean bottom depth associated with the paired trawls was observed. However, this was attributed to the amount of testing done in the vicinity of Monterey Canyon, where small differences in position can result in large changes in bottom depth. From 2004 on, the mean difference in bottom depth ranged from 35-63 m. Comparison of the mean difference in paired trawl vessel positions revealed a downward trend from roughly 1.2 km in 2002, to differences in the 0.3-0.5 km range in 2005-06.

Aggregate length distributions of all YOY rockfish caught in both surveys exhibited similar patterns across years in areas of survey overlap. Within the 'core area' there were between-vessel differences in the mean log-transformed catch for 2001-2002, but no observable differences for 2003-2006. The concentration of PWCC-NWFSC sampling near the continental shelf break in contrast to the high number of SWFSC stations on the continental shelf in shallower waters could have accounted for the differences in catch between the two vessels observed in 2001-2002. Regression analysis of inter-vessel differences in the amounts of rockfish caught in the comparison paired trawls indicated lower catch rates for the F/V *Excalibur*. However, this result was strongly influenced by a small number of trawls from a single year in which the NOAA R/V *David Starr Jordan* had much larger catches. It was noted that more complete inspection of large organisms (e.g. large jelly fish) for YOY rockfish aboard the NOAA R/V *David Starr Jordan* may account for some of the differences. Given the limited number of paired observations, particularly when close proximity of the vessels was used as a filter, the data were not viewed by those in attendance as being sufficient to establish a difference in catchability between the vessels. A comparison of YOY rockfish species richness in the catch of the two vessels showed greater similarity, particularly for paired trawls that were located within 0.3 nm of each other.

Developing a coast-wide survey to estimate inter-annual variation in pre-recruit abundance of Pacific whiting and a comparison of Pacific whiting catches in the SWFSC and PWCC/NWFSC mid-water trawl surveys from 2001-2006

Vidar Wespestad of the PWCC provided an overview of the evolution of the PWCC-NWFSC pre-recruit survey and addressed the development of a coast-wide index for YOY Pacific whiting (*Merluccius productus*). PWCC began conducting limited sampling for YOY Pacific whiting in 1998. The first standardized YOY survey was conducted jointly with the NWFSC in 2001, and has continued on an annual basis since then. In each year, the survey has been conducted aboard the F.V. *Excalibu*r, from Newport, Oregon. The survey utilizes protocols and gear which are similar to those used in the SWFSC survey. There are some differences in station depth between the two surveys, which are largely attributable to the PWCC-NWFSC survey's initial focus on YOY Pacific whiting off the continental shelf and the breadth of the continental shelf throughout much of the northern area. The geographic extent of the survey has expanded over time. From 2001-03, the survey was conducted between roughly 34^{-} 45^{o} N latitude. The survey's range was expanded northward to 47^{o} N latitude in 2004, and to 48^{o} N latitude in 2005.

The trends in mean catch of YOY Pacific whiting from both surveys are very similar. Both exhibit declines from 2001-2003, with increases in 2004, and very low levels in 2005-06. In paired vessel side-by-side trawl comparisons, Pacific whiting catch amounts in the PWCC-NWFSC survey were, on average, 40-50% of amounts caught in the SWFSC survey. However, similar to the YOY rockfish comparison, the difference was attributable to a few large catches from a single year. Annual mean lengths of YOY Pacific whiting caught in both surveys have been within 5-15% of each other since 2001, and both exhibit similar trends in mean length.

Inter-annual variation in the distribution of YOY rockfish on the US west coast and implications for survey utilization

Ian Stewart and Stephen Ralston presented an analysis of the latitudinal distribution of YOY rockfish catch observed by the combined SWFSC and PWCC-NWFSC surveys conducted in 2001-2006. They focused on exploring patterns of coherence among species groups, evaluating the implications of the broader survey area for the longer time-series of 'core area' (36-39^{o} N latitude) coverage.

This analysis included 10 rockfish species sampled during the years 2001-2006, when the combined coverage of the SWFSC and PWCC-NWFSC YOY surveys included spatial coverage of at least 35-45^{o} N latitude. Summaries were performed both with catch-weighted and normalized catches for blocks of 1-degree latitude. Three groups of species were identified: a 'northern' group including black rockfish, yellowtail rockfish, widow rockfish and canary rockfish for whom more than 70% of the normalized catch occurred north of the core-area, a 'southern' group including bocaccio, shortbelly rockfish and squarespot rockfish, for whom more than 50% of the catch occurred south of the core area, and a 'central' group, including stripetail rockfish and chilipepper, whose distribution was more or less centered on the core-area.

The distribution of observed catch in 2004-2006, when the combined surveys extended from 33-47^{o} N latitude, suggested that except for the three southern species, sampling in 2001-2003 probably effectively covered the range of most of the YOY present off the U.S. coast. Beginning in 2004, a bifurcation in the mean latitude of the catch of the northern and southern species suggests some directional change in YOY distribution, but this is confounded with changes in survey coverage. When converted to a z-score and compared across species, no clear trend over time is visible in the mean catch-per-unit-effort (CPUE) by species, although catches in 2006 are relatively low for most species. Further, no clear relationship between mean CPUE and mean latitude was observed.

Across all 10 species in 2001-2006 a relatively unimodal distribution of recruitment over latitude was observed. However, bocaccio and chilipepper both had two or more years with apparently bimodal distribution. When smoothed to reduce sampling effects, it appeared that the survey coverage in 2001-2006 likely captured most of the latitudinal distribution of the recruitment events for these 10 species. All years spanned more than 85% of the smoothed distribution. Consistent with other analyses, many of the modes of these events were centered in and around the core-area. Despite this central tendency, there was little evidence for a consistent fraction of

the recruitment to occur in the core-area (implying constant catchability for that index); instead a nearly uniform distribution for the fraction in the core area was present across years and species. The coast-wide surveys over 2001-2006 indicate substantial variability in the abundance and spatial distribution of YOY catches.

The authors generally concluded that species within the 'northern' and 'southern' groups show coherent shifts in distribution. 'Meta-analysis' of the 10 rockfish species over 6 years implies that 1983-2000 core-area observations have relatively uniform spatial process error (Q's) and are unlikely to contribute significantly to most assessment results. Covariates to latitudinal distribution could be explored (e.g., sea level anomalies), which might allow better use of the 1983-2000 core-area observations. The 2001-2003 series appears to have captured much, but not all of the YOY distributions. Political boundaries (Canada and Mexico) remain a problem: they do not appear to coincide with breaks in recruitment distribution.

Session 2: Incorporating Pre-Recruit Indices in Stock Assessments

Rockfish early life history – stochasticity and compensation

Steve Ralston of the SWFSC delivered a presentation that was designed to focus attention on some of the biological properties of young-of-the-year marine fishes that are perhaps often unappreciated by stock assessment scientists. He reviewed a paradigm of the early life history of fish developed by Houde (1987) that is based on longstanding research into the "recruitment problem" as originally framed by the critical period hypothesis of Johann Hjort. The vast preponderance of research on marine fishes shows that factors affecting mortality during the early larval phase (e.g., 0-15 d) act in a density-independent manner, and that events in the larval phase are chiefly responsible for inter-annual variation in year-class strength. Another large body of research tends to show that density-dependent compensation in marine fishes occurs post-settlement (e.g., Sissenwine 1984; Fogarty 1993; Myers and Cadigan 1993). As a consequence of this type of early life history (stochasticity early – compensation late), one might predict a non-linear relationship between abundance during the pelagic juvenile stage and abundance at the time of recruitment to the fishery. In particular, non-linearity might be construed to be evidence of compensation, wherein high inter-annual variation in pelagic juvenile abundance is reduced, due to density-dependence by the time a year-class recruits. There is direct evidence of this occurring in west coast rockfish. In particular, Adams and Howard (1996) showed that the daily instantaneous mortality rate of settled YOY blue rockfish (Sebastes mystinus) during the latter half of their first year of life was density dependent, with mortality ranging from 0.001 d^{-1} at low densities to 0.008 d^{-1} at high densities. Others (Hobson et al. 2001; Johnson 2006) have shown similar results and have demonstrated, through both observational and experimental manipulations, that the biological mechanism of the density dependence is predation.

From the review of marine teleost early life history that was presented, Ralston concluded that: (1) small stochastic variation in larval mortality rates can create large differences in recruitment, (2) mortality in the egg/larval stage is largely density-independent, consistent with Hjort's critical period concept, (3) post-settlement density-dependent mortality of young-of-the-year is

widespread, and (4) the fundamental process captured by the spawner-recruit relationship is population compensation. Those findings, therefore, imply that: (1) cohorts of pre-settled juvenile fish should show greater variance in numbers than the same cohorts at the age of recruitment, (2) a transformation of pelagic juvenile numbers to account for subsequent density-dependent mortality is appropriate based on biological first principles, and (3) the most logical transformation to use might be the spawner-recruit curve itself.

Temporal and spatial synchrony in recruitment of California Current groundfish based on age-structured stock assessments

John Field, of the Southwest Fisheries Science Center in Santa Cruz, reviewed spatial and temporal synchrony in physics and biological signals in the California Current System (CCS), with a focus on synchrony in recruitment variability for west coast groundfish. This began with a review of literature that describes similarities in physical conditions in the CCS (wind indices, upwelling, sea surface temperature, coastal sea level and transport) over spatial scales of 500 to 1500 kilometers, which have been attributed as key factors in shaping productivity and community structure. Many biological features also reflect such synchrony, for example covariation across similar spatial scales has been described in the literature for coho salmon and Dungeness crab in the California Current (interestingly there was little or no covariation in Chinook salmon survival), with similar patterns observed for salmon and herring in the Gulf of Alaska. Work by Field and Ralston also described similar spatial covariation in rockfish recruitment for chilipepper, widow and yellowtail rockfish, with major geographic boundaries (Cape Mendocino, Cape Blanco, Point Conception), appearing to account for mesoscale differences.

To evaluate temporal synchrony in recruitment, while avoiding confounding from stocks with different exploitation histories, recruitment deviation parameters (essentially, model process error) from assessments conducted in 2005 were evaluated using principal components analysis. Using recruitment deviations for all "reasonably specified" groundfish throughout the CCS, the first PC explained a fairly modest 25% of the variance (with largely positive loadings across a diverse group of taxa), and the second PC appeared to separate flatfish and near-shore roundfish from rockfish and offshore roundfish. By refining the analysis to these clusters, or to solely southern or northern stocks, the leading PC's explained ~40 to 50% of the variance. One interesting difference is that recruitment deviations were largely negative in the 1990s for most rockfish and offshore roundfish (sablefish, hake), while they were largely positive for flatfish and near-shore roundfish (lingcod, cabezon, scorpionfish). The overall results suggested that temporal synchrony seems to be greatest for several suites of species, however it is also possible that integrating data coast-wide may mask covariation among other species over finer regional scales.

An Archaeological Example of a MSE on the Value of a Pre-Recruit Survey

Although it is widely believed that recruitment estimates would be valuable for stock assessment and management, the question requires examination by a formal Management Strategy Evaluation (MSE). Alec MacCall reviewed results from a MSE conducted by him and others

(Huppert *et al*. 1980) for northern anchovies (a highly recruitment-dependent fishery), which did not support this belief. If there is no explicit management response to a recruitment estimate, the problem becomes identical with that of estimating biomass, and under constant harvest rate management, there is very little benefit to be obtained from increasing precision. The anchovy MSE developed a risk averse harvest adjustment based on a recruitment estimate. The study concluded that a recruitment estimate would not support adjusting the underlying harvest policy unless its precision was better than a CV of 30%, and even then the added value would be small.

Session 3: Case studies

A comparative analysis of SWFSC and PWCC-NWFSC pre-recruit Pacific whiting indices: another look and a simple case study

Tom Helser of the NWFSC presented analysis of Pacific whiting data from both surveys and discussed the development of a coast-wide index of abundance. Differences in the depth and latitude of the two surveys were examined through comparison of median depth and latitude, weighted and un-weighted by catch, for the combined and individual surveys from 2001 to 2006. When weighted by catch, the median survey depth increased substantially from un-weighted median station depth. Since 2003, the surveys displayed opposite trends in median catch-weighted depth, which increased from 200 m to over 600 m with the expansion of the SWFSC survey, but fell by nearly half in the PWCC/NWFSC survey. The catch-weighted median latitude of each individual survey was fairly stable since 2001, though the median latitude of the PWCC/NWFSC survey did shift slightly northward in association with the northerly expansion of the survey beginning in 2004. For the two surveys combined, the catch-weighted median latitude was closer to the SWFSC median latitude in 2001, 2002, and 2004, but closer to the PWCC/NWFSC survey median in the remaining years. This analysis suggested that the PWCC and NWFSC surveys need to make better efforts to standardize the allocation of mid-water tows with regard to depth strata.

Comparison of catch rates in areas of survey overlap determined by the minimum and maximum latitudes conducted by the surveys, using non-parametric permutation tests, revealed significant differences between the two surveys. Using this testing approach, overall catch rates of the surveys were found to be significantly different in four of the six years. These findings highlight the need for continued overlap in survey coverage and consistency in the allocation of tows to depth zones. Differences between the surveys may be less pronounced at larger spatial scales, due to increased chances of sampling dispersed patches of YOY Pacific whiting.

Assessment model estimates of recruitment strength were minimally affected by inclusion of historical data from the SWFSC core survey area, as a result of the wealth of age data included in the model and the survey's limited geographic range. However, 2005 recruitment was estimated to be much lower, with a substantially smaller confidence interval, when the YOY index was included in the model. The variability of the SWFSC YOY index (σ_{YOY}=1.41) for the 1986-2000 period was roughly twice that of the coast-

wide index (σ_{YOY} =0.68) for the years 2001-03. The variability of the stock-recruit relationship in the assessment model (σ_R =1.14) fell between these two values. The relative variance among these sources indicates that most recent recruitment deviations are more strongly informed by the coast-wide pre-recruit index than recruitment variation from the stock-recruitment relationship.

Incorporating YOY indices into the assessment and forecast of Pacific whiting abundance.

Steve Martell of the University of British Columbia Fisheries Center, presented the results of simulations designed to test the value of YOY surveys to short-term forecasts of recruitment strength under ranges of YOY survey variability. The simulation was designed to include data gathering, assessment modeling and harvest projection, and management implementation in a closed loop. Four scenarios were evaluated through comparison of deviations between simulated yields and optimal implementation of the 40-10 harvest policy over a 20-year period.

Forecasts of recruitment strength in each of the scenarios were based on different information. These alternatives included: mean recruitment during the preceding five years, the model-estimated stock-recruit relationship, a YOY survey index, and a weighted average of the stock-recruit prediction and the YOY index. For each scenario, the coefficient of variation (CV) of the acoustic survey was set at 0.29 and a range of YOY survey CVs from 0.1 to 1.2 was examined. With the exception of the model relying solely on the YOY survey inform forecasts, all methods performed well in specifying the correct amount of harvest. The model that used only the YOY index performed well for low CVs, but diverged significantly from optimal yields as the CV rose above the CV for the assessment model's recruitment deviations.

The two major sources of error in specifying annual harvests are inaccurate estimation of management reference points, and inaccurate estimates the stock size, including the magnitude of new recruitment. In cases such as whiting, where there is a large amount of historical age-composition data, YOY surveys have little effect on the estimation of reference points. Furthermore, in this case, (if adult survey q is well understood?) improvements in the accuracy with which reference points are estimated would produce only marginal increases in long-term yields. YOY surveys have the potential to improve forecasts, but it may be costly to CVs to levels where they are adding useful information, rather than noise. They also have considerable value in detecting abrupt changes in stock productivity, or shifts in the geographic distribution of spawning.

Case study for bocaccio

Alec MacCall provided an overview of data used in estimating recruitment in the 2005 bocaccio assessment. There is a remarkably large number of potential bocaccio recruitment indexes, with some extending back into the 1970's. The contrast provided by the high variability in bocaccio recruitment provides a good opportunity to evaluate the performances of these indexes and combinations thereof.

The data sources (summarized in Table 1) are as follows:
Base: Recruitments from bocaccio stock assessment (MacCall 2005).
1. "Core" central California juvenile rockfish mid-water trawl survey (data provided by Steve Ralston, SWFSC).
2. CPUE of bocaccio caught from piers, mostly in central California (RecFIN). Sampling effort has declined progressively since 1980.
3. Impingement rates of bocaccio at power plants in southern California (data provided by Kevin Herbinson, Southern California Edison).
4. Densities of juvenile bocaccio observed from submersibles at southern California oil platforms (data provided by Milton Love, UCSB).
5. Spawning stock biomass (SSB) of bocaccio from the stock assessment (MacCall 2005). Because of low apparent steepness (h near 0.2), parental SSB serves as an index of subsequent recruitment.
6. Average recruitment anomaly from three other fishes: chilipepper rockfish (J. Field, pers. comm.), shortbelly rockfish (Field et al., In press), and Pacific whiting (Helser et al. 2006).
7. Frequency of rockfish juveniles (all spp.) in seabird diets at the Farallon Islands (data provided by Bill Sydeman, PRBO).

Table 1. Summary of bocaccio recruitment information sources.

Case	Source	Period	Locality	Npositive	Nzero	Nmissing	Delay (yr)
0	Assessment	1972-2004	So&Cen Cal	33			3
	Direct Observations						
1	MWT Survey	1983-2004	Cen Cal	19	3		0.5
2	Pier CPUE	1980-2002	~Cen Cal	13	7	3	1
3	Power Plant	1972-2000	So Cal	27	2		1
4	Oil Rigs	1996-2005	So Cal	8		1	1
	Inferred Observations						
5	SSR(=SSB)	1972-2004	n/a	33			0
	Indirect Observations						
6	SSR w avg of	1975-2002	Diffuse	28			3
	devs from 3 spp						
7	Seabird Diet	1975-2004	Cen Cal	30			0.5
	all rockfish						

Each time series of direct observations (#1-4) was analyzed by means of a main effects GLM (i.e., no interactions) of log-transformed observations, with year effect interpreted as the log of the annual index value (Table 2). Data series #1-3 contained zeroes, which were either deleted from the data or were replaced with a constant equal to one-half the minimum observed value. Log recruitment index values were regressed on log estimated recruitment; goodness of fit diagnostics were r-squared and RMSE under log-transformation. The slope of the log-log relationship (i.e., the exponent of a fitted power function) was calculated both as an ordinary least square (OLS) y-on-x regression value and as a GM regression value that may better reflect the functional relationship (Ricker 1973). GM slopes are always steeper, so for the power

function exponents in Table 2, GM estimates are larger than corresponding OLS estimates, indicating weaker compensation as estimated by a functional regression.

Table 2. Performance summary of bocaccio recruitment indexes.

		Delete Zeroes				Set Zeroes to 0.5 min value			
Case	**Source**	**r-squared**	**RMSE**	**OLS exp**	**GM exp**	**r-squared**	**RMSE**	**OLS exp**	**GM exp**
	Direct Observations								
1	MWT Survey	0.20	1.16	0.26	0.58	0.23	1.06	0.23	0.49
2	Pier CPUE	0.18	0.97	0.17	0.39	0.47	2.65	0.23	0.33
3	Power Plant	0.37	1.14	0.40	0.65	0.37	1.17	0.34	0.55
4	Oil Rigs	0.28	1.10	0.47	0.88				
	Inferences								
5	SSR(=SSB)	0.24	1.19	0.92	1.89				
alt	slope forced	0.24	1.19	1.00	1.00				
	Indirect Observations								
6	SSR w avg of	0.59	0.87	0.96	1.25				
	devs from 3 spp								
7	Seabird Diet	0.31	1.08	0.67	1.19				
	all rockfish								
	Composites								
8	Avg (1-5)	0.48	1.02			0.50	1.01		
9	Avg (1-4 & 6-7)	0.54	0.95			0.57	0.93		

R-squared values were generally low, and RMSE values tended to be in the vicinity of 1, which was the value of sigma-R in the stock assessment. Thus, no index performed much better than SSB itself in anticipating annual recruitment strengths, and performed far more poorly than the CV=0.3 criterion recommended by Huppert et al. (1980) and described by MacCall in this report. The best performing index was not based on bocaccio at all, but rather was based on inference drawn from three other fish species (#6); however, this index suffers from the longest time delay before it becomes usable (three years, if all assessments are updated annually, otherwise longer yet). For time series #1-3, replacing zero values with a small constant generally did not improve performance.

Conclusion 1: Independent recruitment data support a sigma-r of approximately 1.0.

Conclusion 2: Performance of each index based on direct observation (#1-4) is similar to use of the stock-recruitment relationship (in this case, simply SSB, #5) as a recruitment predictor. Because indexes #1-4 are based on direct observation rather than on an assumed functional relationship on the SRR, if the SRR is used as a likelihood component in the stock assessment, then the direct observations of recruitment merit equal status and may also be used (subject to CV tuning, as usual).

Conclusion 3: Bocaccio recruitment is highly localized in space and time throughout the first year of life, often appearing at only a single location (e.g., the very large 1999 year class was

only seen at the San Onofre power plant, and at no other power plant or in any other recruitment index), and may even be missed altogether. Diffusion of the year class over subsequent years as it is recruited to fisheries allows progressively better estimation of its strength through conventional stock assessment modeling. An open question is whether this pattern of localized recruitment is associated with the relatively low current abundance (i.e., it is a result of local depletion), or whether it occurs at all stock sizes.

Conclusion 4: Separate stock assessments of bocaccio in southern California and central California should be routinely conducted in addition to the combined assessment that has been standard. Although overall recruitment patterns (especially the large year classes) and stock abundance is correlated in the two areas, there are also important differences. The southern California segment appears to have been more lightly exploited, and is less depleted than in central California. There also has been a 30 year trend of increasing recruits per spawner in southern California relative to central California.

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Use of YOY survey catches: case study for canary rockfish

Ian Stewart presented a preliminary analysis of the use of the YOY index in the canary rockfish stock assessment. There has been some debate in the past about how best to evaluate YOY survey information in stock assessment models. In the case of canary rockfish, the situation is further complicated by the fact that due to delayed entry of recruits to the fishery, there is currently no overlap between the coast-wide YOY survey (2001-2006) and relatively precisely estimated recruitment strengths in the assessment model (~1975-2000).

The 'core-area' (36-39^{o} N latitude) survey index during 1983-2000 for canary rockfish included values that ranged from 0.0-5.8, with standard errors (SE) in log space of 0.27-1.4, based on a

jackknife estimator. Five of the 18 observations did not capture any canary rockfish; as has been done in the past, a value equal to one-half of the smallest index recorded was assigned to those years (0.01). The ability of the assessment model to fit these data was evaluated based on four criteria: runs in sign of residuals, linearity in residuals, ~95% confidence interval intersection, and direct comparison of mean input SE vs. root mean-squared error (RMSE) of the model fit. The fit to the standard index had an RMSE of 2.02 and showed inadequate confidence interval intersection, as well as strong evidence of non-linearity (observed vs. expected plot in log space did not follow a 1:1 line for larger observed values). These observations have, in the past, led to the exclusion of these data from the stock assessment model.

To explore the apparent non-linearity and lack of correspondence between input SE and RMSE, a number of alternate model configurations were employed. First, the mean input SE was increased to 1.83; this led to a similar RMSE, but runs in the residual pattern, as well as evidence of non-linearity remained. It was argued that an external transformation of the data via a power function was similar, but not identical to the internal power transformation, does not follow the same paradigm of using the observation sub-model to match expectations with observed data and loses any contribution to the overall model variance from the transformation itself. Therefore it was deemed best to perform this transformation internal to the assessment model. When estimated, the maximum likelihood estimate for the power coefficient on survey catchability was 3.78. Allowing non-linearity through estimation of this parameter appeared to improve the fit, but a substantial mismatch in mean SE (0.83) vs. RMSE (1.39) remained. Inflation of the mean SE to 1.70 resulted in good correspondence with the RMSE, but the estimated value of the power coefficient dropped to 1.95 and the runs in the sign of the residuals returned. From this model behavior, it was concluded that the lack of fit between the expected values in the canary model and the observed index did not appear to be due solely to non-linearity in the relationship or a mismatch in the assumed level of error about the observations, but to additional process error.

An exploration of this phenomenon was performed through the estimation of year-specific catchability parameters. When scaled relative to the maximum value observed, this analysis indicated that in most years only a very small fraction of the recruitment is observed. Estimated catchability was correlated with estimated recruitment strength, which is consistent with the appearance of non-linearity. Simulation of recruitments distributed similarly to those observed in the analysis of Stewart and Ralston (this workshop) for canary rockfish was performed. These simulated recruitments were filtered until the same level of correlation between recruitment strength and the observed index was achieved. This level of process error implied that 30-40% of the largest recruitments would need to be centered on the core-area to realize the pattern of non-linearity and unaccounted-for process error observed for canary rockfish. This was considered a plausible explanation, although the analysis could neither confirm nor reject the true relationship and was intended to be exploratory only.

It was concluded that the variance estimation associated with the YOY survey was an important component to use in assessment models and that alternatives to the jackknife estimator could be explored. Further, zero-observations were influential and current treatment may be inadequate. Estimated variance, non-linearity and zero-observations were confounded, and attempts to address them need to consider all three simultaneously. When spatially induced process error is

reduced through the use of a coast-wide index, it is non-clear that non-linearity will remain a substantial problem in these data.

The 1983-2000 core-area YOY index is unlikely to contribute information to the assessment unless covariates to the spatial distribution of recruitment can be developed to inform annual deviations in catchability. Use of the 2001-2006 coast-wide index appears reasonable, based on the ability of spatial processes to account for lack-of-fit in longer time series. Non-linearity, consistency of input variance, and further diagnosis of process error cannot be assessed until there is temporal overlap in the coast-wide YOY index and well-estimated recruitment strengths in the assessment model. At present, it seems appropriate to consider assessment projections in light of YOY data in an alternate 'states-of-nature' manner until the relationship between coast-wide YOY index and subsequent recruitment strength can be directly explored.

Chilipepper and shortbelly rockfish case studies

John Field, of the Southwest Fisheries Science Center in Santa Cruz, presented case studies of shortbelly, chilipepper and southern widow rockfish, each of which was modeled with SS2 and each of which was explored relative to the fit to the historical Santa Cruz lab juvenile index. As shortbelly rockfish have not been the target of commercial fisheries, and are poorly sampled in traditional trawl surveys, less traditional data such as larval production, larval abundance, and food habits data were used in the model. In particular, seabird diet data from 1975-2005 provided an index of age-0 abundance of shortbelly rockfish, while length-frequency data reconstructed from otoliths in scat samples from California sea lions showed clear patterns of strong and weak year classes. The overall results suggest that the population has undergone significant fluctuations in abundance over the last several decades (presumably in response to variable environmental conditions). The recruitment variability signals from the juvenile survey and the seabird food habits data (from the Central California region) were strongly correlated, and both were moderately correlated to the signals from sea lion food habits data (which is from the Channel Islands, south of Point Conception), although there was some evidence of differences in recruitment north and south of Point Conception. However, the use of a power function in modeling recruitment with the juvenile data was discouraged in an earlier review, due to a lack of age data from the adult population to tune the parameter.

The second case study was on chilipepper rockfish, based on an early version of the model (in SS2) being prepared for the 2007-2008 assessment cycle. Chilipepper are a relatively data rich stock, historically the second most abundant commercial Sebastes species in California (with trace landings north of California), and with commercial age and length composition from 1978 through 2005. From 1983-1998, there is a good relationship between model-estimated recruitments and the power-transformed juvenile index, but much less agreement 1983-2003. This is primarily due to the tremendous strength of the 1999 as informed by age and length data (the 1999 year class accounts for over half the landed fish between 2002 and 2006), which was not observed in the juvenile survey. The internal model fit to the juvenile index without a power transform is poor, however the fit with a power transform was somewhat better. The decision of whether to include (or not) the juvenile index has a very significant impact on stock status and productivity.

A final case study was presented for southern widow rockfish, developed in SS2 using landings and age composition data from the "Eureka" fishery in the coast-wide model (covering Eureka, Monterey and Conception areas). This was done to look at regional differences in recruitment that might explain differences in how well the model fits the juvenile survey data. The results were consistent with what was has been noted in the residuals to catch at age fits in the coastwide model by fishery and area, with stronger recruitment inferred in the north in 1980-81, and stronger recruitment inferred in the south in 1984-85, and 1987-88. The external fit between model estimated recruitment and the juvenile index (1983-2001) is considerably better with the southern model than the coast-wide model, (R^2 of 0.20 v. 0.39), and when the juvenile index fit internally, the fit is quite good both with and without a power relationship. However, the juvenile index appears to have an undue influence on estimates of year class strength that should have been better informed by age composition data.

– Appendix 1 –

Agenda

Pre-Recruit Survey Workshop

September 13-15, 2006

Southwest Fisheries Science Center
110 Shaffer Road
Santa Cruz, CA 95060

Wednesday, September 13, 2006

8:00 a.m.	Morning Refreshments
8:30 a.m.	Welcome and Introductions
8:45 a.m.	Review Goals and Objectives of the Workshop

Session 1. Developing a Coast-wide Survey of Groundfish Pre-Recruit Abundance
Moderator: Jim Hastie

9:00 a.m.	Steve Ralston: "Long-term variability in abundance of pelagic juvenile rockfishes in central California based on results from the Tiburon/Santa Cruz midwater trawl survey."
9:40 a.m.	EJ Dick: "Bayesian hierarchical methods in estimating the abundance of pelagic juvenile rockfish from survey data."
10:10 a.m.	Break
10:40 a.m.	Keith Sakuma: "A comparison of rockfish catches in the SWFSC and PWCC/NWFSC midwater trawl surveys from 2001-2006."
11:20 a.m.	Vidar Wespestad: "Developing a coastwide survey to estimate interannual variation in pre-recruit abundance of Pacific whiting and a comparison of Pacific whiting catches in the SWFSC and PWCC/NWFSC midwater trawl surveys from 2001-2006"
12:00 p.m.	Lunch
1:00 p.m.	Ian Stewart & Steve Ralston: "Interannual variation in the distribution of YOY rockfish on the US west coast and implications for survey utilization.
1:40 p.m.	Discussion: Question #1 - Can data from the R/V David Starr Jordan and the F/V Excalibur be combined into a coast-wide index for young-of-the-year Pacific whiting and rockfish?
3:00 p.m.	Break
3:30 p.m.	Continue discussion and develop suggestions for further analysis on the question of survey integration and utilization.

Thursday, September 14, 2006

Session 2: Incorporating Pre-Recruit Indices in Stock Assessments
Moderator: Steve Ralston

8:00 a.m. Morning Refreshments

8:30 a.m. Steve Ralston: "Rockfish early life history – stochasticity and compensation."

9:10 a.m. John Field: "Temporal and spatial synchrony in recruitment of California Current groundfish based on age-structured stock assessments."

9:40 a.m. Alec MacCall: "An archeological example of a MSE on the value of a pre-recruit survey."

10:00 a.m. Break

10:30 a.m. Discussion: General Biological/Modeling Issues

12:00 p.m. Lunch

Session 3: Case Studies
Moderator: Steve Ralston

1:00 p.m. Tom Helser & Steve Martell: "Pacific whiting"

1:40 p.m. Alec MacCall: "Bocaccio"

2:20 p.m. Ian Stewart: "Canary rockfish"

3:00 p.m. Break

3:30 p.m. John Field: "Chilipepper and shortbelly rockfish"

4:10 p.m. Xi He: "Widow rockfish"

If time permits, we'll begin discussing Question #2 below before breaking for the day.

Friday, September 15, 2006

8:00 a.m. Morning Refreshments

Session 4. Workshop Discussion
Moderator: Jim Hastie

8:30 a.m. Discuss Questions #2-4:

Question #2 - Is a power transformation (e.g., widow rockfish) an acceptable way of modeling early life history processes and, if not, what other analytical techniques are more appropriate?

Question #3 - What processes (e.g. density-dependent mortality, measurement error) affect the relationship between a survey index of pre-recruit abundance and model estimates of recruitment?

Question #4 - How influential are pre-recruit survey data on: (1) historical estimated times series of stock abundance and (2) projections into the near term? How can the informational value of a pre-recruit survey to a stock assessment be evaluated?

11:00 a.m. Conclusions / Wrap-Up
11:00 a.m. Report Drafting by co-chairs
12:00 p.m. Workshop Adjourns

Appendix 2: List of Participants

Ken Baltz NMFS, SWFSC
E.J. Dick NMFS, SWFSC
Martin Dorn NMFS, AFSC
John Field NMFS, SWFSC
Tom Ghio PFMC, GAP
Jim Hastie NMFS, NWFSC
Tom Helser NMFS, NWFSC
Tom Jagielo WDFW, SSC
Isaac Kaplan NMFS, NWFSC
Shirley Lee NMFS, NWFSC
Alec MacCall NMFS, SWFSC
Steve Martell UBC
Stacey Miller NMFS, NWFSC
Mike O'Farrell SC lab
Christine Peterson NMFS, SWFSC
Jason Phillips OSU, CIMRS
Steve Ralston NMFS, SWFSC
Keith Sakuma NMFS, SWFSC
Sue Sogard NMFS, SWFSC
Kevin Stierhoff NMFS, SWFSC
Ian Stewart NMFS, NWFSC
John Wallace NMFS, NWFSC
Vidar Wespestad PWCC

Agenda Item E.1.c
Supplemental SSC Report
April 2007

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON THE NATIONAL MARINE FISHERIES SERVICE REPORT

The Scientific and Statistical Committee (SSC) reviewed the reports of three of the four off-year workshops held during 2006. The report of the harvest policy workshop was reviewed by the SSC during the March Council meeting. The SSC notes that the off-year workshops provide a means for developing a common approach to dealing with specific assessment-related problems and that the benefits of these workshops will be maximized if their recommendations are provided to all assessment authors and Stock Assessment and Review (STAR) Panel participants

The SSC notes that a committee of independent experts (CIE) reviewer attended the bottom trawl survey workshop. However, the report from this reviewer was not available to the SSC.

The NWFSC Bottom Trawl Survey workshop considered how best to use the results from the "expanded" shelf-slope survey during the 2007 round of stock assessments. The SSC endorses the recommendation from the workshop that the "expanded" shelf-slope survey should either be treated as a new index or used to extend the current slope survey index. The SSC notes that the data from the triennial and "expanded" surveys can be combined, but this would requite adequate support from the analyses. The SSC also agreed with the workshop recommendation that assessment updates should not use the data from the "expanded" survey if they are to be reviewed as assessment updates. However, this means that there will be no new information on trends in abundance for widow rockfish and English sole.

The SSC supports the recommendation from the Data/ Modeling workshop that the approach used to represent stock status in assessment reports should be modified, and members of the SSC Groundfish Subcommittee will work with the developer of SS2 to implement this. The SSC notes that although it was anticipated that deadlines would be set for when data are to be received for the 2007 stock assessments, no actual dates have been set; such dates should be set for the 2009 round of groundfish assessments. Finally, the SSC supports the recommendation from the Data/Modeling workshop that a single "best" catch series by species and state should be constructed. This is particularly important for rockfish species.

The SSC endorses the conclusion of the Pre-Recruit Survey workshop that it is possible to combine the data from 2001-06 from the RV David Starr Jordan and the FV Excalibur, and that the earlier SWFSC data should not be used in stock assessments, except in those for species found predominantly in the "core" area surveyed by the SWFSC. The SSC supports assessment authors critically evaluating alternative assumptions for how pre-recruit data should be included in stock assessments, but notes that only a few assessments will be able to make use of pre-recruit data for the 2007 round of stock assessments.

PFMC
04/06/07

Agenda Item E.2
Situation Summary
April 2007

CONSIDERATION OF INSEASON ADJUSTMENTS

The Council set optimum yield (OY) levels and various management measures for the 2007 groundfish management season with the understanding these management measures will likely need to be adjusted periodically through the biennial management period with the goal of attaining, but not exceeding, the OYs. The Groundfish Management Team (GMT) and the Groundfish Advisory Subpanel (GAP) will begin meeting on Monday, April 2, 2007 (see Ancillary A and Ancillary B agendas) to discuss and recommend inseason adjustments to ongoing 2007 groundfish fisheries.

Under this agenda item, the Council is to consider advisory body advice and public comment on the status of ongoing and upcoming fisheries and recommended inseason adjustments prior to adopting final changes. The Council may provide guidance to the GMT and GAP prior to making final inseason adjustments under Agenda Item E.4 on Thursday, April 5, 2007, or make final inseason adjustments under this agenda item. If the latter course is chosen, the Council may cancel Agenda Item E.4 or direct that opportunity be provided to confirm or clarify the Council decision under Agenda Item E.4.

Council Action:

1. **Consider information on the status of ongoing fisheries.**
2. **Consider and adopt inseason adjustments as necessary.**

Reference Materials:

1. Agenda Item E.2.b, GMT Report: 2007 Projected Mortality Impacts (mt) of Overfished Groundfish Species Under Current Regulations.

Agenda Order:

a. Agenda Item Overview — John DeVore
b. Report of the Groundfish Management Team (GMT) — Kelly Ames
c. Agency and Tribal Comments
d. Reports and Comments of Advisory Bodies
e. Public Comment
d. **Council Action:** Adopt Preliminary or Final Recommendations for Adjustments to 2007 Groundfish Fisheries

PFMC
03/13/07

2007 Projected mortality impacts (mt) of overfished groundfish species under current regulations. Updated with March 2007 inseason adjustments. a/

3/12/07

Fishery	Bocaccio b/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	26.1	8.1	1.5	247.4	89.8	1.6	0.4
Limited Entry Trawl- Whiting							
At-sea whiting motherships		4.7		25.0	1.0	220.0	0.0
At-sea whiting cat-proc					2.9		0.0
Shoreside whiting					1.8		0.0
Tribal whiting		0.7		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear		1.1		1.3	0.4		2.9
Sablefish	13.4		0.0			0.0	
Non-Sablefish			0.1			0.5	
Open Access: Directed Groundfish		1.0					
Sablefish DTL	0.0		0.1	0.2	0.1	0.0	0.5
Nearshore (North of 40°10' N. lat.)	0.0	1.7		0.0	0.0	0.1	2.0
Nearshore (South of 40°10' N. lat.)	0.0			0.0	0.0		
Other	10.6			0.0	0.0	0.0	0.1
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.0		0.0	0.0		
CA Gillnet c/	0.5			0.0	0.0	0.0	
CA Sheephead c/				0.0	0.0	0.0	0.0
CPS- wetfish c/	0.3						
CPS- squid d/							
Dungeness crab c/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut c/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	0.8	0.0	0.0	0.0	0.3	0.2
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish e/							
WA		5.7					6.2
OR						1.4	
CA	98.0	8.3	0.4			8.0	1.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs. f/							
	2.0	7.5	0.1	3.8	3.6	0.9	2.0
TOTAL	151.4	43.1	2.2	277.8	103.9	279.0	18.5
2007 OY	218	44.0	4.0	290	150	368	23
Difference	66.6	0.9	1.8	12.3	46.1	89.1	4.5
Percent of OY	69.4%	98.0%	55.0%	95.8%	69.3%	75.8%	80.3%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available					

a/ All numbers reflect projected annual total catches except that the non-tribal "Limited Entry Trawl- Whiting" numbers are the total bycatch caps for canary, darkblotched, and widow rockfish.

b/ South of 40°10' N. lat.

c/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

d/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

e/ Values in scorecard represent projected impacts. However, harvest guidelines for 2007 are as follows: canary in WA and OR combined = 8.2 mt and in CA = 9.0 mt; yelloweye in WA and OR combined = 6.8 mt and in CA = 2.1 mt.

f/ Research projections only updated for canary rockfish in November 2006. The other species' updates will be updated in April 2007.

THE GROUNDFISH MANAGEMENT TEAM REPORT ON CONSIDERATION OF INSEASON ADJUSTMENTS

RECREATIONAL

California
California Department of Fish and Game (CDFG) provided an update regarding their plan (March 07 Agenda Item E.5.e, Supplemental Groundfish Management Team [GMT] Report) to modify the California Recreational Fisheries Survey estimation programs and rerun the recreational catch projection model for 2007 using 2004-2006 estimates. The GMT was notified that the approach provided in this plan has been modified and timeline revised. Updated groundfish catch projections for the 2007 recreational fishery will be provided at the June Council meeting, but these projections will only be based upon the 2005 and 2006 estimates.

COMMERCIAL

Limited Entry Trawl North of 40°10' N. latitude.

Non-whiting Trawl Fishery

Leadbetter Point to WA/OR Border - 60 fm shoreward RCA boundary
At the March 2007 meeting, the Council asked the GMT to analyze the effect of closing the shoreward area between Leadbetter Point and the OR/WA border during period 4. The concern was that a 60 fathom shoreward trawl Rockfish Conservation Area (RCA) boundary would result in increased trawl effort in shallow areas where Dungeness crab are more abundant and that the RCA boundaries adopted during the March inseason session would negatively impact soft-shelled crab, molting crab and crab fishery participants. The GMT reviewed logbook, fish ticket, and observer data to compare the impact of closing this area in period 4 against the impact of a 60 fathom RCA boundary. Available information shows that in recent years the majority of trawl effort and catch has occurred shoreward of 60 fathoms and substantial amounts of this effort and catch occur shoreward of 40 fathoms. Available observer data shows that closing this area to shore in period 4 would result in a reduction of 0.1 metric tons of canary rockfish in the non-whiting trawl fishery. Based on this information, the GMT believes that a 60 fathom RCA boundary in this area would not lead to a substantial shift in trawl effort and therefore should not result in significant increased impacts on the crab resource and on crab fishery participants.

The GMT recognizes that Dungeness crab bycatch occurs in the groundfish trawl fishery and that there are varied perceptions regarding the associated impacts upon the crab resource. While the Council manages groundfish, Dungeness crab management has been delegated to the coastal states. Therefore, trawl bycatch of Dungeness crab has received little attention in the Council process. Management measures to protect soft-shelled molting crab have been implemented for the directed Dungeness crab fishery, but have not been considered during the development of groundfish management measures. While some historical studies have been conducted in other areas, the GMT recognizes that little empirical information exists to quantify the spatial distribution, magnitude, or mortality of crab bycatch in the west coast trawl fishery. Information

currently being collected by the West Coast Groundfish Observer Program (WCGOP) should help provide the basis to evaluate crab bycatch, along with other trawl bycatch issues, in establishing fishery management measures.

Limited Entry Trawl South of 40°10' N. latitude

Non-whiting Trawl Fishery

Chilipepper Rockfish
The GMT received a request to consider increasing chilipepper rockfish limits in the areas shoreward and seaward of the RCAs (March 07 Agenda Item E.5.e, Supplemental GMT Report). At the beginning of 2007, chilipepper rockfish was removed from the overall 300 lb/month small footrope limit for minor shelf rockfish, and a 500 lb/month limit was established for chilipepper in order to reduce discards of chilipepper rockfish in the flatfish fisheries. The GMT will submit a data request to the WCGOP and will review chilipepper rockfish/flatfish catch ratios and bycatch correlations to explore a concern of potential targeting of chilipepper rockfish.

Limited Entry Fixed Gear

Minor Shelf Rockfish South of 40°10' N. latitude.
The GMT received a request to consider a limit that combines widow, chilipepper and bocaccio rockfish for the fixed gear sectors in the southern and central California regions (March 07 Agenda Item E.5.e, Public Comment 1). The GMT notes that this proposal was mischaracterized in our March inseason statement. To clarify, the proposal includes two inseason actions for the limited entry fixed gear fishery in central California (between 40°10' N. latitude and 34°27' N. latitude) relative to chilipepper and associated shelf rockfish species. The first was to provide higher seaward chilipepper target opportunities in central California (between 40°10' N. latitude and 34°27' N. latitude) using limited entry fixed gear. The second was to modify the chilipepper trip limits for the area seaward of the RCA by recombining minor shelf rockfish, shortbelly, and widow rockfish limits. The GMT will submit a data request to the WCGOP and review the amount of chilipepper rockfish relative to overfished species seaward of the RCA south of 40°10' N. latitude.

Open Access Fixed Gear

Sablefish South of 36° N. latitude.
The GMT received a request to set daily sablefish trip limits at a consistent rate of 700 lbs to allow for more efficient trip planning and sustained participation (Agenda Item E.2.e). The GMT does not support an increase in daily sablefish trip limits at this time due to concerns of increased participation in the open access fishery as a result of the proposed increase in sablefish daily trip limits and reduced salmon opportunities, as occurred in 2006. In addition, increases in the daily limit of this magnitude have resulted in dramatic increases in participation in the past. The GMT suggests delaying any recommendations until such time that we can evaluate salmon fishery participation and if needed, revisit this issue at the June Council meeting.

Open access and limited entry fixed gear lingcod trip limits

Lingcod

The GMT received a request to increase lingcod cumulative trip limits in the nearshore and offshore areas north and south of 40°10' N. latitude (March 07 Agenda Item E.5.e, Supplemental GMT Report). The GMT analyzed the available data and found that very few vessels attained their lingcod limits. For those vessels landing lingcod in 2005 and 2006, approximately 12% approached the limited fixed gear limit and 20% for open access. In 2007, open access lingcod limits were increased by 100 lbs/month. The GMT is concerned that any increase in lingcod limits and subsequent targeting may result in increased bycatch of canary and yelloweye rockfish. With regard to open access, since the number of participants in this fishery is unlimited, any increase in lingcod limits could lead to a rapid expansion in the fishery without any corresponding accountability measures for bycatch of overfished species. Since the current limits are not being attained in either the open access or limited entry fisheries, the GMT does not support an increase to the current limits.

GMT Recommendations

The GMT recommends no changes to the current fishery structure.

PFMC
04/04/07

GROUNDFISH ADVISORY SUBPANEL REPORT ON CONSIDERATION OF INSEASON ADJUSTMENTS

The Groundfish Advisory Subpanel (GAP) discussed inseason adjustments considered for ongoing groundfish fisheries with the Groundfish Management Team (GMT). The GAP agrees with the GMT that no inseason adjustments are needed as this time. The GAP will continue to monitor landings and impacts in groundfish fisheries and may propose inseason adjustments at the June Council meeting.

PFMC
04/04/07

March 20, 2007

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

RE: COMMENTS ON THE "CONCEPTION" ALLOCATION OF SABLEFISH BELOW 36 DEGREES IN CALIFORNIA

Dear Chairman Hansen,

The Fishing Heritage Group, comprised of harbormasters, ocean conservationists, and fishermen, is uniquely positioned to forge consensus on fishing and environmental issues in California and build support for PFMC initiatives. One issue that we believe needs immediate attention from the PFMC and NOAA is the current management of the open access allocation of sablefish below the 36 degree demarcation. During the 2006 season, NOAA allotted 271 metric tons of sablefish to the open access fisherman in this region. Unfortunately, the daily catch limits were very uneven and unpredictable, making it difficult for fisherman to plan their harvest and implement profitable day trips. The problem seems to stem from a fluctuating daily limit, varying from 300 pounds per day one week then 500 pounds per day the next week. What we have discovered is that the 300 pounds daily limit leads to very inefficient fuel consumption, and does NOT provide enough financial incentive for a fisherman to conduct day trips and pay for gas, crew, and other operating expenses while turning a profit.

We also observed that only 178 metric tons of the "Conception" sablefish allocation was harvested before the season or year ended – leaving 93 metric tons on the table. While seeming like a small amount of fish, that volume would have been very helpful to the Morro Bay harbor, fleet and economy. We have a new fish buyer in Morro Bay and his company, working with the harbor, TNC and ED and others, is moving towards branding a sustainable black cod product harvested with hook and lines or traps.

We understand that the sablefish "Conception" allocation has been reduced to 211 metric tons this year. Considering National Standard 8 of the Magnuson-Stevens Act, which requires that conservation and management measures "take into account the importance of fishery resources to fishing communities…in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities," the fishing heritage group wishes to make the recommendation that the daily trip limit be set at a consistent number, say 700 pounds. This will allow for more efficient trip planning and sustained participation while still adhering to the open access allocation.

Sincerely,

Brian Foss – Santa Cruz Port District Director
Jay Elder – Harbor Manager, Port San Luis
Rick Algert – Harbormaster, City of Morro Bay
Steve Scheiblauer – Harbormaster, City of Monterey
Linda G. McIntyre - General Manager/Harbormaster, Moss Landing Harbor District
Peter Grenell – General Manager, San Mateo County Harbor District
Jeremiah O'Brien – Morro Bay Commercial Fisherman's Organization
Kathy Fosmark – Alliance of Communities for Sustainable Fisheries
Tom Capen – President, Port San Luis Commercial Fishermen Association
Chris Kubiak – Independent fishery consultant, fisherman
Michael Sutton – Vice President, Monterey Bay Aquarium
Rod Fujita – Senior Scientist, Environmental Defense
Chuck Cook – Director, Coastal and Marine Program, The Nature Conservancy

On behalf of the Fishing Heritage Group

FISHING HERITAGE GROUP MEMBERSHIP

Harbors:
Linda McIntyre, Moss Landing; Steve Scheiblauer, Monterey; Rick Algert, Morro Bay; Jay Elder, Port San Luis Harbor; Peter Grenell, Half Moon Bay; Brian Foss, Santa Cruz

Fishermen:
Kathy Fosmark and Mike Ricketts, Alliance of Communities for Sustainable Fisheries; Jeremiah O'Brien, Morro Bay Commercial Fishermen's Organization

Nongovernmental Organizations:
Chuck Cook, The Nature Conservancy; Rod Fujita, Environmental Defense; Mike Sutton, Center for the Future of Oceans, Monterey Bay Aquarium

Observer/Advisors:
Greg Haas – District Representative for Congresswoman Lois Capps

AMENDMENT 15 AMERICAN FISHERIES ACT

When Congress passed the American Fisheries Act (AFA) in 1998, Congress designated the Pacific Fishery Management Council (Council) to develop conservation and management measures to protect West Coast groundfish fisheries from potential harm caused by the AFA. The AFA states that if the Council does not recommend such conservation and management measures by January 1, 2001, "the Secretary may by regulation implement adequate measures including, but not limited to, restriction on vessels which harvest pollock under a fishery cooperative which will prevent such vessels from harvesting Pacific groundfish, and restriction on the number of processors eligible to process Pacific groundfish." In September 1999, the Council initiated Amendment 15 to the Pacific Coast Groundfish Fishery Management Plan (FMP) to address this concern and enacted a control date of September 16, 1999 regarding participation by catcher vessels in mothership and shore-based Pacific whiting fisheries, and in the inshore groundfish fishery for non-whiting species. The Council has also set a control date of June 29, 2000 which provides advance notice to the public and potential purchasers of limited entry permits held by AFA entities that, based on future Council action, groundfish limited entry permits held by an AFA entity may be revoked or restricted to a specific fishery sector. However, because of competing workload and no threatened imminent harm, the Council tabled action on Amendment 15 in 2002. Attachment 1 of this agenda item is a summary of the alternatives from the draft Environmental Assessment at the Council's last consideration of Amendment 15 to the Groundfish FMP (September 2001).

The Council readdressed Amendment 15 at its September 2006 meeting following testimony to the Legislative Committee and the Council regarding anticipated entrance into the West Coast Pacific whiting fishery by AFA-qualified vessels with no prior history in the fishery. At the September 2006 meeting, the Council voted to move forward expeditiously to complete Amendment 15 for first use in the 2008 fishery with direction to simplify the alternatives brought forward for Council consideration.

At the March 2007 Council meeting, the Council discussed a schedule of final Council action and the June or September Council meeting. As an interim protective mechanism, the Council also voted to request that National Marine Fisheries Service (NMFS) enact an emergency rule to be implemented for the 2007 non-tribal season that prohibits sector-specific participation by American Fisheries Act qualified vessels that did not participate in the Pacific whiting fishery prior to December 31, 2005. In March 2007, based on concerns of adverse conservation, economic, and safety effects to the 2007 fishery that could result from an unrestricted derby style fishery, the Council broadened its original emergency rule request to prohibit participation in the 2007 non-tribal Pacific whiting fishery by all vessels without sector-specific history in the fishery prior to January 1, 2007.

At the September 2006 Council meeting, the Oregon Department of Fish and Wildlife (ODFW) volunteered to take the lead in preparing a preliminary draft Environmental Assessment including a simplified range of alternatives for Council consideration in March. This agenda item was moved to the April Council meeting and the ODFW report is included. (Agenda Item E.3.b, ODFW Report). Under this agenda item, the Council is to review and revise the preliminary alternatives for detailed analysis and public review.

Council Action:

1. **Adopt a Preliminary Range of Amendment 15 Alternatives for analysis and public review.**

Reference Materials:

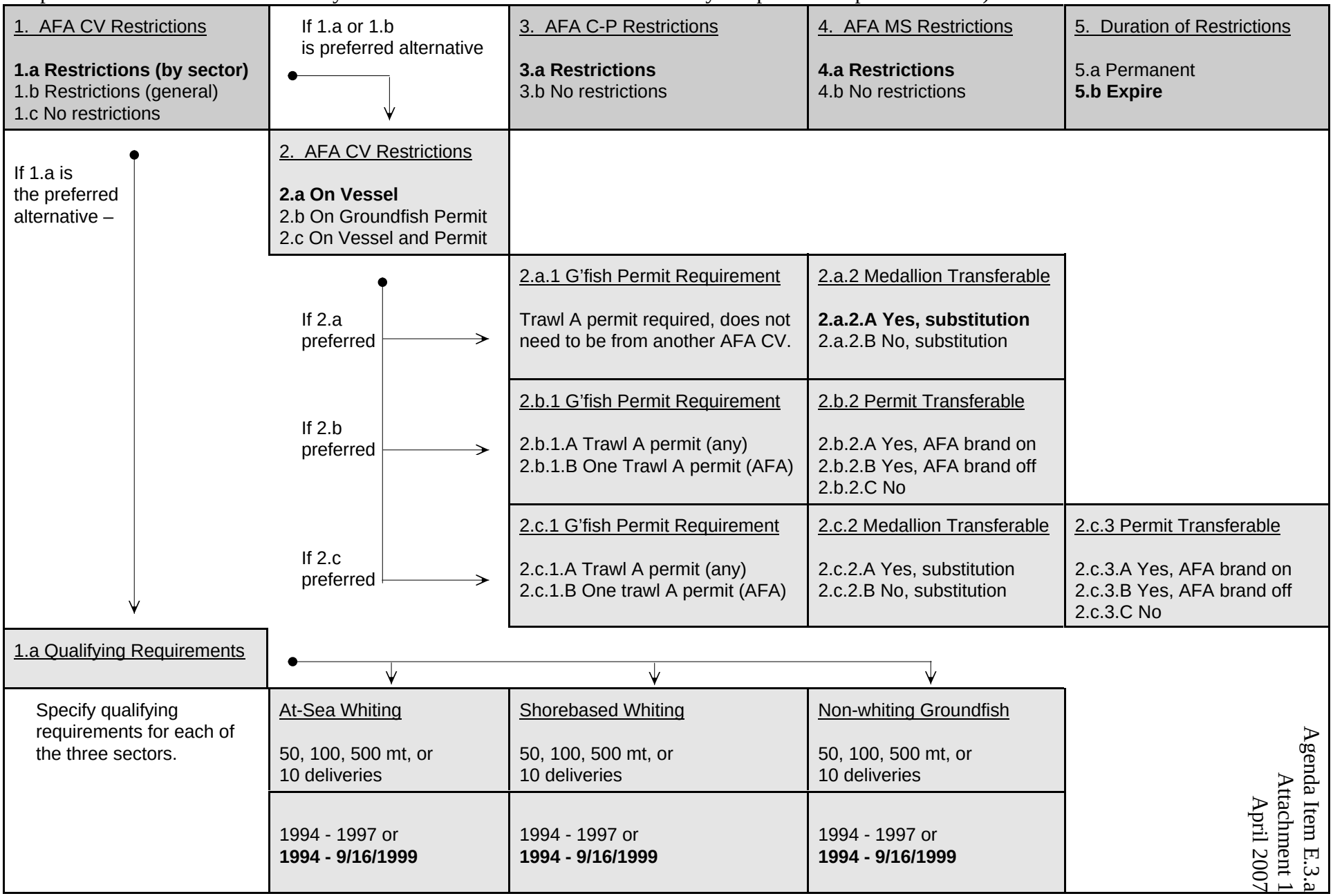
1. Agenda Item E.3.a, Attachment 1; Figure 1 - AFA Alternatives Considered at the September 2001 Council Meeting.
2. Agenda Item E.3.b, ODFW Report; Preliminary Revised Range of Amendment 15 Alternatives.

Agenda Order:

a. Agenda Item Overview — Mike Burner
b. ODFW Report — Curt Melcher
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. **Council Action:** Adopt Preliminary Alternatives for Analysis

PFMC
03/20/07

FIGURE 1. AFA Alternatives Considered at the September 2001 Council Meeting. (**Bold text** represents preliminary preferred alternatives for analysis and public review as recommended by the Council and the Groundfish Advisory Subpanel in September 2001.)



Agenda Item E.3.b
ODFW Report
April 2007

AMENDMENT 15: AMERICAN FISHERIES ACT

In response to the recent Pacific Fishery Management Council (Council) action in September 2006 and March 2007, the Council has indicated a strong desire to address alternatives for protecting West Coast groundfish fisheries from adverse impacts caused by vessels qualified under the American Fisheries Act (AFA). Draft alternatives are provided here for Council consideration.

Under the AFA, both the Council and National Marine Fisheries Service/Secretary were given direction to take actions to address these concerns. To date, neither agency has taken action. In the recent Council actions mentioned above, a significant amount of Council and NMFS time has been directed towards addressing two requests for short-term emergency actions to prevent adverse impacts in 2007's shoreside and at-sea whiting fishery. Staffing has not been provided to address a proactive response.

These alternatives are intended to initiate action among Council members and advisory bodies in April 2007, to avoid further delays that threaten the west coast groundfish fisheries. Future action will require a response from Council staff and NMFS staff to address this coast-wide concern. Absent such action, and in order to avoid further workload on short term emergency actions, Oregon has drafted alternatives. Further work on this critical permanent fishery protection will require concurrent support by Council staff and NMFS.

The alternatives that were developed by the Council and last reviewed at the September 2001 Council meeting were considered to be overly complex at that time. There were alternatives developed to accommodate five issues: qualifying criteria for AFA catcher vessels; whether the restrictions would apply to vessels, permits, or both; qualifying criteria for AFA catcher-processors; qualifying criteria for AFA motherships; and duration of the restrictions.

The alternatives being proposed for further analysis at this time are as follows:

1. Status Quo- No restrictions placed on AFA-qualified vessels.

2. Prohibit participation in the shoreside, catcher/processor, and mothership sectors of the Pacific whiting fishery by AFA-qualified vessels that do not have a historic participation record in those sectors prior to 2006 (i.e., participation in the shorebased, catcher-processor, or mothership sector by December 31, 2005).

3. Prohibit participation of AFA-qualified vessels separately in each of the three sectors of the groundfish fishery (at-sea whiting, shorebased whiting, and non-whiting groundfish) who had not:

   - Catcher Vessel: delivered at least 50-500 mt (to be determined) of groundfish in any year during the period of January 1, 1994 to September 16, 1999.

   - Catcher-Processor: licensed to harvest groundfish in the years 1997, 1998, or January 1, 1999-September 16, 1999.

   - Mothership: received at least 1,000 mt of Pacific whiting during the regular whiting season in 1998 or 1999.

   The qualifying periods in this alternative represent those adopted by the Council at the September 2001 Council meeting as the Council preferred alternative. Additional analysis is requested to determine a preferred landing/delivery criteria for the catcher vessel sector. It is our understanding that this analysis was not completed.

Sector specific qualifying alternatives that were detailed in the Draft Environmental Assessment are shown in table 1. The restrictions contained in these alternatives would apply to the vessel, as it is the vessel which is identified and qualified under AFA and remain in effect until such time as the Groundfish Fishery Management Plan is amended to remove the restrictions.

Table 1. Other qualifying alternatives considered.

Catcher Vessel Minimum Landings/Deliveries Options		
At-Sea Whiting Deliveries	Shorebased Whiting Landings	Non-Whiting Groundfish Landings
50 mt	50 mt	50 mt
100 mt	100 mt	100 mt
500 mt	500 mt	500 mt
10 deliveries	10 deliveries	10 deliveries
Catcher Vessel Qualifying Periods		
1994-1997		
1994-October 1, 1999 (also had to have a groundfish permit by October 1, 1998		
Catcher-Processor/Mothership Minimum Landings/Deliveries/Qualifying Period Options		
No options other than that presented in the alternatives in this report were included in the Draft Environmental Assessment		

GROUNDFISH ADVISORY SUBPANEL REPORT ON AMENDMENT 15: AMERICAN FISHERIES ACT

Recommendations

The Groundfish Advisory Subpanel (GAP) recommends adopting for preliminary analysis the three alternatives described in Agenda Item E.3.b, the Oregon Department of Fish & Wildlife Report, with the addition of a starting date of 1994 for Option 2. The GAP also recommends that this issue be on the June agenda in order to accommodate a final decision on a preferred alternative in September 2007.

The GAP had a detailed discussion regarding the current status of Amendment 15 and the proposed schedule for completion and implementation of the amendment. The GAP also discussed the task before the Council at this meeting: to adopt a range of preliminary alternatives for analysis. The GAP provides comments on both the schedule for completion and a range of alternatives for analysis.

Background

The GAP believes it is important to reiterate the reasons Amendment 15 was initially undertaken. The PFMC newsletter from spring 2000 states:

"Under the American Fisheries Act (AFA) of 1998, only certain vessels and processors are eligible to participate in the Bering Sea Pollock fishery. This eligibility provides greater flexibility in when and how these vessels and processors participate in the Pollock fishery. Because these AFA vessels and processors are better able to arrange their schedules, they could potentially maximize participation in other fisheries, including West Coast groundfish fisheries. The concern is that AFA vessels and processors will use benefits gained by the AFA to move into West Coast groundfish fisheries, increase effort, and cause harm to current participants. To prevent this harm, the AFA provides the Council the opportunity to recommend management measures to protect fisheries under its jurisdiction and participants in those fisheries."

Control dates of September 16, 1999 and June 29, 2000 were published to notify AFA beneficiaries that future Council action could prevent their participation in the fishery.

Current Status

The GAP recognizes that increased participation in the whiting fishery during recent years by AFA qualified vessels has occurred. In addition, if the emergency rule recommended to the National Marine Fisheries Service in March of 2007 is not implemented, an increase in participants during the 2007 fishery is also expected. Of particular concern is any increased impact on depleted groundfish stocks. In order to meet the AFA mandate and provide increased stability to all sectors of the whiting fishery, the GAP believes that the Council should move forward with Amendment 15 expeditiously. There is an urgent need for Amendment 15 to be implemented prior to the 2008 whiting fishery.

DRAFT # 2

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE REPORT ON AMENDMENT 15 AMERICAN FISHERIES ACT

With regard to the Council's preliminary action in March 2007 to address the potential adverse impacts to the Pacific whiting fishery resulting from new entrants, the Washington Department of Fish and Wildlife still believes that adopting measures that limit participation should be done through a full rule-making process and that a reasonable range of alternatives needs to be considered and fully analyzed.

Before the Council decides to move forward with Amendment 15, we need a thorough understanding of the implementation timeline for the amendment, the scope and timeline for the Trawl Rationalization Program, and the ability to extend an emergency rule (if approved by the National Marine Fisheries Service) to cover the 2008 season.

While we acknowledge the responsibility of the Council to develop conservation and management measures to protect West Coast groundfish fisheries from potential harm caused by the American Fisheries Act (AFA), we also recognize that there could be harm to the Pacific whiting fishery resulting from increased effort by non-AFA qualified vessels. To the extent that measures can be developed to address both of these issues (i.e., AFA-qualified participants entering West Coast groundfish fisheries—whiting and non-whiting—and non-AFA-qualified vessels entering the whiting fishery) we believe the Trawl Rationalization Program is the best mechanism to address these issues.

We are also concerned that initiating a new process, or resurrecting an old one, may interfere with the Council's ability to complete the development of a Trawl Rationalization Program within the two-year timeframe prescribed by Congress. Again, to the extent that the issues associated with AFA-qualified vessels can be addressed through the Trawl Rationalization Program without causing a delay in the timeline for that effort, we would advocate using that avenue, rather than beginning a new process to address Amendment 15.

With respect to the draft alternatives that were considered by the Council in 2001, and the proposed alternatives presented by the Oregon Department of Fish and Wildlife (ODFW) in Agenda Item E.3.b, ODFW Report, we propose adding another alternative.

When considering actions to limit participation, we strongly believe that the range of alternatives needs to include allowing the continued participation by vessels that have participated to date. This would provide for a comprehensive analysis of the impacts on those participants that would be affected by the different alternatives, and the ability to thoroughly see the effects of each alternative when compared to one another. To that end, we propose including the following alternative in the suite of alternatives adopted for public review and analysis:

2.a. Prohibit participation in the shoreside, catcher/processor, and mothership sectors of the Pacific whiting fishery by AFA-qualified vessels that do not have a historic participation record in those sectors prior to 2007 (i.e., participation in the shorebased, catcher-processor, or mothership sector by December 31, 2006).

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March 21, 2007

Whiting Emergency Rule
Public Comment

Frank Lockhart
Assistant Regional Administrator
NMFS/NWR
7600 Sand Point Way NE, Bin C15700
Seattle, WA 98115-0070

Dear Mr. Lockhart

I have testified many times before the Council of the need to think outside the box when it comes to the whiting resource. I have described how one vessel owner I represent has figured out a way for any fishermen in our rural coastal communities, that have been unable to harvest whiting because of waste disposal concerns, could land whiting products in their port. I have explained that our port infrastructures would not be vanishing if some whiting were landed in our ports to support the loss of fishing grounds and diminished groundfish landing revenues. I have detailed how a resource we encounter almost every time we fish, right out our doors, is caught by vessels from another locale that leave with not only the resource but also the revenues they generate, without benefit to our local rural communities or the state of Oregon. I have challenged the Council to think outside of the box on this resource to do something different, to end the required discarding of this product. Fishing laws demand an end to discards and discards that are caused by regulations should be top priority to the Council, the NMFS, NOAA, the Department of Commerce and Congress. Management should manage fisheries by the laws passed by congress to avoid lawsuits filed by environmental groups and angry taxpayers. Perhaps, fishermen and rural communities, that are adversely affected by laws not being enforced, should join the list of suits filed against the government.

While we support the Council's concept to control Alaskan AFA boat entry into fisheries on the lower forty-eight, we can not support the elimination of our local fleet from this resource. Is this control of AFA boats going to regulate how a fishermen chooses to add-value to his catch? The F/V Stormie C has history in whiting and will receive quota shares if/when the ITQ program is implemented. In 2006, the 69 foot Stormie C harvested 700,000 pounds of headed and gutted whiting and received an ex-vessel price five times greater than other whiting landings. This was accomplished by thinking outside the box with a desire to reduce the discards encountered while fishing. Short tows with a small net have far less impact on by-catch and habitat than the giant nets of a factory trawler. Short tows also allow the crew to feed the fish into head and gut machines discharging the waste at sea, places the product in thick slurry ice before rigor even sets in, assuring the highest quality product. Concerns from our niche markets (foreign) about

the tail weight, exposed spine bones, shipping costs and profit margins last year have lead the Stormie C to modify its production plan for 2007. It includes clipping the exposed spine bones at the freezing facility, to remove the tails at sea and to add an additional h&g machine to keep up with the catch rate. So, now, to stop the AFA and other boats from fishing whiting, the Stormie C will again be forced to modify its 2007 production plan just months before deployment. Should the Council and NMFS control how fishermen can add value to their whiting catch, or any other catch?

The Stormie C has invested a considerable amount of capital in head/gut and tailing technology, research, refrigeration systems, conveyors and an observer data gathering center in preparation for the 2007 season. This emergency rule will adversely affect this operation. The shoreside processing facility that freezes and ships the product, has invested additional capital into its plant to prepare for this season. It is ready to buy other boats' whiting "by-catch" to help reduce the discards we all encounter. Additional freezer plates were manufactured in speculation of the increased "by-catch" turned back into my-catch, and to deal with a "whiting in the round" product. The plant was also planning to employ 40 to 50 extra workers for 3 months, to handle the production flow which would help our depressed area immensely.

All this took years of careful planning and investment for a program to be implemented. The owner of the F/V Stormie C created a project agreement with the owner of a shoreside processing facility. The production plan's mainstay product was to be headed/gutted/tailed whiting from the Stormie C and whole round whiting from other non-whiting boats that currently discard 100% of their whiting catch. Many man hours were used to develop the plan and to make sure every requirement was addressed. Market development, products to produce, weight conversion factors to cover our operations, plant tail weights and length experiments, observer contracts and accommodations, plant freezer capabilities and storage facilities, all ready to go.

The new and improved Magnuson-Stevens Act spoke loud and clear that the nation does not want our fisheries to be controlled by some big conglomerates putting our resources in the pocket of a few rich individuals. The dedicated access language clearly intends our fisheries to have the same characteristics it has today and does not want consolidation controlled by large corporations. As it is right now, 80% of the whiting caught on the west coast is controlled by two individuals. To go forward with any regulations that would write that in stone is against the spirit of the law. THE REDUCTION OF DISCARDS is an important factor to our industry's image, a demand by modern law, a way to turn "by-catch" into "my-catch", to turn waste into revenue, to turn raper of the ocean into stewards of the resource.

We ask for exemptions to the Emergency Whiting Limitation Rule for any vessel that is under 80 feet long that has a west coast trawl groundfish permit. These vessels should be encouraged to find innovative ways to reduce discards because that is the demand of the New Magnuson-Stevens Act.

Sincerely,

Steve Bodnar,	Dennis Cutting,	Mike Erdman
Executive Director	F/V Stormie C	Oregon Brand Seafoods

signed letter sent via US Postal Service

Agenda Item E.4
Situation Summary
April 2007

FINAL CONSIDERATION OF INSEASON ADJUSTMENTS (IF NECESSARY)

Consideration of inseason adjustments to ongoing groundfish fisheries may be a two-step process at this meeting. The Council will meet on Wednesday, April 4, 2007, and consider advisory body and public advice on inseason adjustments under Agenda Item E.2. If the Council elects to make final inseason adjustments under Agenda Item E.2, then this agenda item may be cancelled or the Council may wish to clarify and/or confirm these decisions. If the Council tasked advisory bodies with further analysis under Agenda Item E.2, the Council task under this agenda item is to consider advisory body advice and public comment on the status of ongoing 2007 groundfish fisheries and recommended inseason adjustments for 2007 groundfish fisheries prior to adopting final changes as necessary.

Council Action: Consider information on the status of ongoing fisheries and adopt inseason adjustments as necessary.

Reference Materials: None.

Agenda Order:

a. Agenda Item Overview — John DeVore
b. Report of the GMT — Kelly Ames
c. Agency and Tribal Comments
d. Reports and Comments of Advisory Bodies
e. Public Comment
f. **Council Action:** Adopt or Confirm Final Adjustments to 2007 Groundfish Fisheries

PFMC
03/13/07