Report of the Pre-Assessment Workshop for 2019 Groundfish Stock Assessments

Pacific Fishery Management Council Office
Large Conference Room
7700 NE Ambassador Place, Suite 101
Portland, OR 97220
503-820-2280

25 – 26 March 2019

Introduction

A pre-assessment workshop for five stocks that will be assessed during the 2019 stock assessment cycle was held at the Pacific Fishery Management Council office on 25-26 March 2019 and was also conducted via webinar. A separate workshop / webinar for the Cabezon stock assessment was held during December 2018. The pre-assessment workshop also reviewed the Draft 2019 Accepted Practices and Guidelines for Groundfish Stock Assessments.

The workshop began with a welcome by the meeting chair, Dr. David Sampson, followed by a round of self-introductions from the workshop attendees. A list of attendees and the meeting agenda are appended to this report. After a brief review of the agenda, Dr. Sampson and Mr. John DeVore presented an overview of the workshop objectives. As laid out in the Terms of Reference for Stock Assessments, the pre-assessment workshop provides stock assessment teams (STATs) an opportunity to describe plans for upcoming stock assessments to associated Stock Assessment Review (STAR) Panel chairs, Council staff, representatives from the Groundfish Management Team (GMT) and the Groundfish Advisory Panels (GAP), and state agency data stewards. The workshop provides a forum for open discussion of potential data quality and stock assessment modeling issues. It is timed to allow the STATs to make modifications well in advance of the STAR panels.

Cowcod

Dr. E.J. Dick presented slides describing plans for the 2019 stock assessment for cowcod. The assessment will follow very similar structure as used in past PFMC assessments for this species. There will be a stock boundary at Point Conception with a relatively "data-rich", assessment for cowcod in the southern region and a data-poor (Depletion Based Stock Reduction Analysis, DB-SRA) stock assessment for cowcod in the northern region. Unlike the most recent (2013) assessment for the southern stock, conducted as a data-moderate assessment using extended DB-SRA (xDB-SRA), the 2019 assessment will be conducted using Stock Synthesis (SS) with Bayesian estimation of parameter uncertainty. Because SS is not parameterized in terms of the ratio F_{MSY}/M (used in xDB-SRA), the STAT will need to develop a suitable approach for developing priors for the SS model.

The SS model for southern California will have a commercial fishing fleet and a recreational fishing fleet and five fishery-independent indices: a spawning biomass index based on CalCOFI ichthyoplankton data (1951-2018); a 2002 submersible-based visual survey from the Cowcod Conservation Area; sanitation district trawl surveys (since 1970), the Northwest Fisheries

Science Center (NWFSC) trawl survey (2003-2018), the NWFSC hook and line survey (2004-2018), and a 2012 Southwest Fisheries Science Center (SWFSC) remotely operated vehicle (ROV) survey of the southern California Bight region. Five of these indices were included in the 2013 xDB-SRA assessment; the SWFSC ROV survey is new.

New information in the 2019 assessment will include additional recent years of fishery removals and fishery-independent index values, newly available information on fecundity, and additional length and age data (~450 fish from the NWFSC surveys). The available length and age data may be sufficient to allow estimation of growth (and associated uncertainty) within the model.

The assessment will use the Hamel prior distribution for natural mortality (median M of 0.098 yr^{-1} given a maximum age of 55 yrs.) rather than the catch curve based prior used in the 2013 assessment (mean M of 0.055 yr^{-1}). The majority of discussion focused on whether the maximum age of 55 yrs, based on limited samples taken during an era when the stock was exploited, was reflective of the true maximum age. Dr. Dick indicated that he will continue to investigate maximum age as natural mortality will be one of the most influential parameters to the cowcod assessment.

Use of the SS modeling platform may allow greater flexibility in representing selectivity and associated uncertainty. Potential challenges for the new assessment include how to account for the spatial expansion of the NWFSC hook and line survey into the Cowcod Conservation Areas, which were not sampled prior to 2014, and how to parameterize productivity in the SS model to mimic the flexibility of the 2013 xDB-SRA model.

Sablefish

Dr. Melissa Haltuch presented slides describing plans for the 2019 stock assessment for sablefish, which received a full assessment in 2011 and an update assessment in 2015. Dr. Kelli Johnson, who is assisting with the assessment, was also present to address questions from workshop participants. The 2019 assessment will be based on an adaptation of the recent previous assessments with a coastwide Stock Synthesis (SS) model having the three fishing fleets used previously (hook-and-line, pot, and trawl), plus a new fleet to account for bycatch of small sablefish by the at-sea and shoreside fisheries for Pacific hake. The same set of four biomass indices will be used (Alaska Fisheries Science Center (AFSC) Triennial shelf trawl survey, AFSC slope trawl survey, NWFSC slope trawl survey, and NWFSC shelf/slope combination trawl survey). Additional index values will only be available for the NWFSC shelf/slope combination trawl survey.

Other new information in the 2019 assessment will include a recently completed catch reconstruction for sablefish landed in Washington, results from a new maturity study, and extended series for compositional data for the fishing fleets and the NWFSC shelf/slope combination survey. The new assessment will extend the structure of the age compositional data to 60 age bins (compared to 35 in the 2011 and 2105 assessments) and will also explore using environmental data to drive recruitment deviations in years that are poorly informed by age composition information. The first environmental index will be derived from sea surface height observational data. The second environmental index will be based on an analysis of outputs from a Regional Ocean Modeling Systems (ROMS) model, if available, that comprehensively accounts for ocean dynamic processes thought to influence sablefish early life history.

There was discussion of problems associated with processing sablefish data housed in the Pacific Fisheries Information Network (PacFIN) Biological Data System. The problems arise with sablefish because individuals are often landed as dressed fish and therefore require special treatment by the software that estimates expanded age and length compositions. The software package available from the NWFSC for processing PacFIN data has recently undergone a significant and comprehensive overhaul by Dr. Kelli Johnson, and will benefit all assessments using biological data from PacFIN. There was also discussion of how the STAT should treat sablefish caught by midwater trawl gear operated by vessels that are not part of the at-sea fleet that targets Pacific hake. Selectivity of midwater trawlers targeting rockfish (for example) is unlikely to be the same as either the selectivity of the at-sea fleet targeting Pacific hake or the selectivity of the bottom trawl fleet. However, it was determined that this would not be a problem because few sablefish have been caught in the midwater rockfish fishery since the fishery re-emerged in 2017. The shoreside whiting fleet on the other hand operates similarly to the at-sea fleet (and has some overlapping participants) and therefore will be included with the at-sea fleet as a single whiting fleet.

Accepted Practices Guidelines for Groundfish Stock Assessments

Participants at the workshop reviewed a draft version of the 2019 *Accepted Practices Guidelines for Groundfish Stock Assessments* that had been developed by the SSC's Groundfish Subcommittee. Suggested revisions to the draft document were noted and relayed to the SSC for review at the SSC's April meeting.

Gopher Rockfish / Black-and-Yellow Rockfish Complex

Dr. Melissa Monk presented slides describing plans for the 2019 stock assessment for gopher rockfish and black-and-yellow rockfish, which are two rockfish species that occur primarily off California. These species are morphologically indistinguishable except for their coloration. A recent genetic analysis found very small differences between the two species (pairwise $F_{ST} = 0.015$). The two species will be modeled as a single species complex for the 2019 assessment. Previously they have been modeled separately. In 2005, a Stock Synthesis model was developed for gopher rockfish from Point Conception to Cape Mendocino and a Depletion-Corrected Average Catch model was applied for gopher rockfish catches south of Point Conception. In 2010, a coastwide DB-SRA model was applied for black-and-yellow rockfish. Available data are limited for both species but are much more limited for black-and-yellow rockfish.

The STAT plans to develop a Stock Synthesis model for the region south of 40º10' N lat. Negligible to zero landings of either species have been reported in Oregon or Washington. The model will likely be structured to have three fishing fleets: one commercial fleet and two recreational fleets separated at Point Conception. The recreational fleets are separated to better account for apparent discarding of smaller fish by recreational anglers in southern California. The STAT had not decided whether to model discards as a separate fleet or use size-based retention curves.

There are four potential data sources for developing biomass indices. Two are fishery-independent sources that monitor marine protected areas and nearby reference sites: one from dive surveys by the Partnership for Interdisciplinary Studies of Coastal Oceans and the other

from hook-and-line surveys by the California Collaborative Fisheries Research Project. The two fishery-dependent sources are from observers onboard commercial passenger fishing vessel from central California during 1987-1998 and broader coverage in later years.

The available length-at-age data are from fish collected by a variety of sampling gears (mostly hook-and-line, but also spear and trap) and are mostly from gopher rockfish and from north of Point Conception. Growth curves fit to the available data suggest no large differences in length-at-age between the sexes or between the species. The STAT will use the Hamel prior for natural mortality and will explore estimating *M* within the assessment model.

Longnose Skate

Dr. Vlada Gertseva presented slides describing plans for the 2019 stock assessment for longnose skate, which was last assessed in 2007 using a coastwide Stock Synthesis model. In the 2007 assessment, there was single trawl fleet and four survey indices of stock biomass: the AFSC Triennial shelf survey, the AFSC slope survey, the NWFSC slope survey, and the NWFSC shelf/slope combination survey. A major source of uncertainty in the assessment was the historical time series of catches, which was derived from a historical landings reconstruction of unspecified skates, the proportion of longnose skate in the unspecified skate landings (assumed to be 53% in years prior to 1981), an assumed 93% discard rate, and an assumed 50% discard mortality rate.

For the 2019 assessment, Dr. Gertseva developed and will use a new approach for estimating the catch history for longnose skate based on a linear regression model that predicts the catch of longnose skate from the catch of Dover sole, for which historical catch estimates are available. The dependent variable for the linear regression model was the West Coast Groundfish Observer Program (WCGOP) annual estimates of the coastwide total catch (landings plus discards) of longnose skate for the period 2009 to 2017 and the independent variable was the corresponding WCGOP annual estimates of coastwide total catch (landings plus discards) of Dover sole. The regression model has good predictive power ($R^2 = 95.7\%$) over the range of the Dover sole catches (6,500 to 12,500 mt). New landings series for skates were recently reconstructed by the three states and reviewed at a separate workshop held directly after the pre-assessment workshop.

The STAT plans to structure the fishery into three fleets: (1) a historical coastwide fleet for the period prior to 1995, which is when there was a significant increase in the landings of skates, (2) a recent (from 1995) coastwide non-tribal fleet, and (3) a WA tribal fleet. Length-composition data from observers aboard the recent non-tribal fleet indicate that retained longnose skate are larger than discarded fish, implying that the model may need to incorporate length-based retention. Because no length composition data are available from the historical fleet, selectivity for the historical fleet will be mirrored from the recent non-tribal fleet. The 2019 assessment will incorporate age and length data collected since the 2007 assessment, but limited age data are available. The assessment will use the same four abundance indices of biomass as the 2007 assessment, with recalculation of the indices using the vector-autoregressive spatio-temporal (VAST) software. The NWFSC shelf/slope combination survey includes 10 additional years of data, whereas there are no new data from the other surveys. Natural mortality will be based on the Hamel prior.

Big Skate

Dr. Ian Taylor presented slides describing plans for the 2019 stock assessment for big skate, a species for which the Council has not previously had an assessment. Information for this skate species is more limited than for longnose skate, in part because the requirement to sort landings of big skate in the shore-based Individual Fishing Quota fishery from landings of unidentified skate was not implemented until June 2015. The discard component of the catch reconstruction for big skate may be based either on the catch reconstruction for longnose skate and the assumption that the two species experience similar discard rates (discard / total catch) or on a similar analysis with links to species that co-occur with big skate. Data from the Pikitch discard study (1985-1987) and from WCGOP (2015-2017) support the idea that discard rates for the two species are very similar. Also, market demand for skates does not seem to distinguish between the two species. There are insufficient years of data from the WCGOP to develop a regression model for big skate as was done for longnose skate.

The 2019 assessment for big skate will be developed using the Stock Synthesis software but will need to be very simple given the paucity of available data. Biomass indices for big skate have been developed from the AFSC Triennial shelf survey and the NWFSC shelf/slope combination survey. It may also be possible to develop an index from the International Pacific Halibut Commission longline survey. Although there should be sufficient length-composition data available to inform selection curves for these surveys and a fishery, there are very limited length and age data (from 333 fish from the 2010 survey). These data may be sufficient to inform development of a growth curve and derive an estimate of natural mortality from the Hamel prior.

Appendix A. Workshop Attendees

Portland, OR Attendees

Dr. David Sampson, Oregon Department of Fish and Wildlife, Newport, OR (Chair)

Dr. John Budrick, California Department of Fish and Wildlife, Belmont, CA

Mr. John DeVore, Pacific Fishery Management Council, Portland, OR

Ms. Jessi Doerpinghaus, Washington Department of Fish and Wildlife, Olympia, WA

Dr. Vladlena Gertseva, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle, WA

Mr. Craig Good, Oregon Department of Fish and Wildlife, Brookings, OR

Dr. Owen Hamel, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle WA

Dr. Kelli Johnson, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle WA

Mr. Steve Joner, Makah Tribe, Port Angeles, WA

Ms. Mel Mandrup, California Department of Fish and Wildlife, Sacramento, CA

Ms. Stacey Miller, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle WA

Mr. Patrick Mirick, Oregon Department of Fish and Wildlife, Newport, OR

Mr. Todd Phillips, Pacific Fishery Management Council, Portland, OR

Mr. Gerry Richter, B&G Seafoods, Santa Barbara, CA

Dr. Andi Stephens, National Marine Fisheries Service Northwest Fisheries Science Center, Newport, OR

Dr. Ian Taylor, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle WA

Newport, OR Attendees

Mr. Justin Ainsworth, Oregon Department of Fish and Wildlife, Newport, OR

Mr. Christian Heath, Oregon Department of Fish and Wildlife, Newport, OR

Mr. Scott Malvitch, Oregon Department of Fish and Wildlife, Newport, OR

Ms. Lynn Mattes, Oregon Department of Fish and Wildlife, Newport, OR

Mr. Cameron Sharpe, Oregon Department of Fish and Wildlife, Newport, OR

Santa Cruz, CA Attendees

Dr. Joe Bizarro, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA

Dr. E.J. Dick, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA

Dr. John Field, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA

Dr. Xi He, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA

Dr. Melissa Monk, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA

Online Attendees

Dr. Aaron Berger, National Marine Fisheries Service Northwest Fisheries Science Center, Newport, OR

Mr. Aaron Berges

Dr. John Budrick, California Department of Fish and Wildlife, Belmont, CA

Mr. Troy Buell, Oregon Department of Fish and Wildlife, Newport, OR

Mr. Ted Calavan, Oregon Department of Fish and Wildlife, Newport, OR

Ms. Susan Chambers, West Coast Seafood Processors Association, Charleston, OR

Mr. Mike Drexler, Ocean Conservancy, St. Petersburg, FL

Ms. Sheryl Flores, Oregon Department of Fish and Wildlife, Astoria, OR

Mr. Mark Freeman, Oregon Department of Fish and Wildlife, Newport, OR

Dr. Melissa Haltuch, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle, WA

Mr. Corbin Hilling, Virginia Tech, Blacksburg, VA

Mr. Bill James, Salem, OR

Ms. Melanie Parker, California Department of Fish and Wildlife, Monterey, CA

Ms. Marissa Pauling, Oregon Department of Fish and Wildlife,

Mr. Dan Platt, Fort Bragg, CA

Ms. Corey Ridings, Ocean Conservancy, Santa Cruz, CA

Dr. Will Satterthwaite, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA

Mr. Sam Seaborne

Ms. Maggie Sommer, Oregon Department of Fish and Wildlife, Newport, OR

Dr. Cody Szulwalski, National Marine Fisheries Service Alaska Fisheries Science Center, Seattle, WA

Appendix B. Agenda

PROPOSED AGENDA
Pre-Assessment Workshop for 2019 Groundfish Stock Assessments

Pacific Fishery Management Council
Large Conference Room
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220
Telephone: 503-820-2280

March 25-26, 2019

This meeting will also be conducted via webinar. To attend the webinar:

- Use this link: https://www.gotomeeting.com/webinar and click "Join a Webinar" in the top right corner of the page;
- Enter the Webinar ID, which is 433-536-835, and your name and email address (required);
- After logging into the webinar, dial this TOLL number 1+ (213) 929-4232 (not a toll-free number);
- Enter the Attendee phone audio access code: 596-914-734;
- Enter your audio phone pin (shown after joining the webinar).

NOTE: We have disabled Mic/Speakers on GoToMeeting as an option and require all participants to use a telephone or cell phone to participate.
You may send an email to Mr. Kris Kleinschmidt at kris.kleinschmidt@noaa.gov or contact him at 503-820-2280, extension 411 for technical assistance.

MONDAY, MARCH 25, 2019 – 1 PM

A. Call to Order

1. Call to Order and Introductions — Dave Sampson
2. Webinar Instructions — John DeVore
3. Overview of Workshop Objectives — Dave Sampson, John DeVore, and Stacey Miller
4. Assign Rapporteurs — Dave Sampson
5. Approve Agenda

(1 p.m., 0.5 hours)

B. Cowcod — E. J. Dick
(1:30 p.m., 2 hours)

1. Assessment History
2. Progress on Previously Identified Research and Data Needs
3. Data Sources Considered for This Assessment (Including Source, Years, Spatial Extent)
4. Define Proposed Spatial Stock Structure
5. Fleet Structure
6. Additional Exploration of Data Series

7. Data Processing/Analysis
    a. Approaches to Developing Indices
    b. Forms of Compositional Data Included in Model
    c. How Discards, Weights-at-Age, etc. are Considered
8. Initial Data Trends
    a. Fishery-Independent Indices
    b. Fishery-Dependent Indices
    c. Landings and Discards
    d. Compositional Data
    e. Length Compositions of Aged Fish
9. Model Inputs / Modeling Approaches
    a. Natural Mortality Rate (M)
    b. Proposed/Explored Approach Used to Weight Age and Length Composition Data
    c. Selectivity
    d. Fecundity
10. Potential Challenges for this Assessment
11. Other Items as Appropriate

C. Sablefish Melissa Haltuch

(3:30 p.m., 2 hours)

1. Assessment History
2. Progress on Previously Identified Research and Data Needs
3. Data Sources Considered for This Assessment (Including Source, Years, Spatial Extent)
4. Define Proposed Spatial Stock Structure
5. Fleet Structure
6. Additional Exploration of Data Series
7. Data Processing/Analysis
    a. Approaches to Developing Indices
    b. Forms of Compositional Data Included in Model
    c. How Discards, Weights-at-Age, etc. are Considered
8. Initial Data Trends
    a. Fishery-Independent Indices
    b. Fishery-Dependent Indices
    c. Landings and Discards
    d. Compositional Data
    e. Length Compositions of Aged Fish
9. Model Inputs / Modeling Approaches
    a. Natural Mortality Rate (M)
    b. Proposed/Explored Approach Used to Weight Age and Length Composition Data
    c. Selectivity
    d. Fecundity
10. Potential Challenges for this Assessment
11. Other Items as Appropriate

TUESDAY, MARCH 26, 2019 – 8:30 AM

A. Call to Order, Continued

1. Call to Order — Dave Sampson
2. Repeat Webinar Instructions — John DeVore
3. Comments on Yesterday's Discussions

(8:30 a.m., 0.5 hours)

D. Accepted Practices Guidelines for Groundfish Stock Assessments
(9 a.m., 1 hour)

1. Overview of Revisions — Dave Sampson
2. Science Center Comments and Recommendations
3. Recommended Revisions

E. Gopher/Black-and-Yellow Rockfish — Melissa Monk
(10 a.m., 2 hours)

1. Assessment History
2. Progress on Previously Identified Research and Data Needs
3. Data Sources Considered for This Assessment (Including Source, Years, Spatial Extent)
4. Define Proposed Genetic Stock Structure
5. Define Proposed Spatial Stock Structure
6. Fleet Structure
7. Additional Exploration of Data Series
8. Data Processing/Analysis
    a. Approaches to Developing Indices
    b. Forms of Compositional Data Included in Model
    c. How Discards, Weights-at-Age, etc. are Considered
9. Initial Data Trends
    a. Fishery-Independent Indices
    b. Fishery-Dependent Indices
    c. Landings and Discards
    d. Compositional Data
    e. Length Compositions of Aged Fish
10. Model Inputs / Modeling Approaches
    a. Natural Mortality Rate (M)
    b. Proposed/Explored Approach Used to Weight Age and Length Composition Data
    c. Selectivity
    d. Fecundity
11. Potential Challenges for this Assessment
12. Other Items as Appropriate

LUNCH (12 – 1 p.m.)

F. Longnose Skate Vlada Gertseva
(1 p.m., 2 hours)

1. Assessment History
2. Progress on Previously Identified Research and Data Needs
3. Data Sources Considered for This Assessment (Including Source, Years, Spatial Extent)
4. Define Proposed Spatial Stock Structure
5. Fleet Structure
6. Additional Exploration of Data Series
7. Data Processing/Analysis
    a. Approaches to Developing Indices
    b. Forms of Compositional Data Included in Model
    c. How Discards, Weights-at-Age, etc. are Considered
8. Initial Data Trends
    a. Fishery-Independent Indices
    b. Fishery-Dependent Indices
    ~~c. Landings and Discards~~ (Subject of Tomorrow's Skates Catch Reconstruction Workshop)
    d. Compositional Data
    e. Length Compositions of Aged Fish
9. Model Inputs / Modeling Approaches
    a. Natural Mortality Rate (M)
    b. Proposed/Explored Approach Used to Weight Age and Length Composition Data
    c. Selectivity
    d. Fecundity
10. Potential Challenges for this Assessment
11. Other Items as Appropriate

G. Big Skate Ian Taylor
(3 p.m., 2 hours)

1. Data Sources Considered for This Assessment (Including Source, Years, Spatial Extent)
2. Define Proposed Spatial Stock Structure
3. Fleet Structure
4. Additional Exploration of Data Series
5. Data Processing/Analysis
    a. Approaches to Developing Indices
    b. Forms of Compositional Data Included in Model
    c. How Discards, Weights-at-Age, etc. are Considered
6. Initial Data Trends
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    d. Compositional Data
    e. Length Compositions of Aged Fish

7. Model Inputs / Modeling Approaches
    a. Natural Mortality Rate (M)
    b. Proposed/Explored Approach Used to Weight Age and Length Composition Data
    c. Selectivity
    d. Fecundity
8. Potential Challenges for this Assessment
9. Other Items as Appropriate

H. Overview of Workshop Findings
(5 p.m.)

ADJOURN