SEDAR 49 – Data Poor Species
Assessment Webinar II
25 August 2016, 10:00 AM – 12:40 PM

Introduction

Outstanding issues and a data review were conducted at the previous webinar, along with assessment approaches for each species. Yellowmouth grouper were recommended to be excluded from this assessment effort, and would be more appropriately assessed with scamp (due to species ID issues).

Indices for snowy grouper and speckled hind will be reviewed today, along with additional assessment methods and preliminary results. Decision rules for setting catch limit recommendations will also be discussed, and sensitivity analyses will be identified for Webinar III in September 2016.

Snowy Grouper and Speckled Hind Indices

Indices don't appear to show shift in effort to offshore areas, and increase in mean length (selectivity and effort shifting). Time to dig into the details of this issue is at a premium.

Assessment Approaches

The Data-Limited Modeling (DLM) Tool is being used to assess the candidate species. Based on the available data, assessment methods which are most appropriate will be used to generate catch and management advice for each species. Catch curve analysis will also be used for red drum, and the Gedamke and Hoenig mean length estimator will also be explored.

One method which is being explored is the catch-based CC1 method, which uses landings from the previous years (number of years may vary) to determine a reasonable catch level for subsequent years (also may vary). This method, though more simple than some other options, may help provide management advice for stocks which are very "data poor".

An index-based method, known as IslopeOFL, takes the landings from the previous five years and scales the total allowable catch based on the slope of those landings. This method is incorporating landings trends to help determine a reasonable catch level, which may be more preferable than the CC1 method. An alternative index-based method, called the index-target method (Itarget1), contrasts the average CPUE from the last five years against the historical CPUE from the last ten years.

Length-based options include LstepCC1 and Ltarget1. These methods are similar to the index methods, in that they contrast recent landings data against historical data; however, they also include data on lengths as opposed to only landings.

Several age-based options are available, many of which incorporate several data inputs. Each uses a catch curve to estimate current abundance, using (Z – M) = F, or total mortality minus

natural mortality to find fishing mortality. Growth data, recruitment, max age, steepness, and other metrics may be necessary, depending on which model is selected. Obviously if a model requires data which are unavailable for a species, and a suitable proxy species is not identified, then that method may not be used for that species.

The mean length estimator method incorporates growth data; however, the mortality results coming out of this method were suspect. The analytical team recommends investigations into the limitations of this approach, and requests improved data collection efforts to fill gaps in knowledge and data resolution. The implications of the age-based mortality estimator included in this method also require additional investigation.

The management strategy evaluation tool is a simulation study which examines and identifies the best procedures for implementing management actions to achieve specified species management goals. After a catch limit is implemented, the subsequent population-level data are collected along with landings data, and these data are collectively analyzed to determine whether management actions are meeting specified goals. This tool allows resource managers to estimate the effects of certain management decisions based on the perceived stock status from the assessment. The role of MSE in the DLM tool is to determine which life histories perform in which ways, given the assessment method used. Expert consensus is used to determine whether a species' life history falls within the tolerance for a specific assessment method. No method using a point estimate for depletion will be used.

Performance Metrics

- Probability of not overfishing is constrained at 50% or less
- Probability of biomass remaining above 50% of B_{MSY}
- Keep average annual variability in yield at < 15%
- Given a fixed F_{MSY}, catch remains greater than 50% of the long-term yield

To determine if these metrics are being achieved, method convergence is analyzed for each method proposed. Whether metrics have stabilized for a particular method determine whether additional simulations are needed. Different scenarios can be run for each method, and so long as the outcomes are within a specified tolerance, the model can be declared to be less sensitive to potential sources of uncertainty.

Process Decisions

- Projected assessment intervals: 10 years
- Projections period: 40 years
- DLM Tool:
    - Exclude methods that do not meet minimum criteria?
    - Determine whether method assumptions are met or violated
    - Analyze information quality used to determine model results
        - Are life history inputs reflective of the assessed species?
        - Is the index representative of the trends in the resource?

Data reliability scores were used to guide decisions on model parsimony. Scores were on a scale of "good", "fair", and "poor". Lesser amberjack and Almaco jack were both exceptionally data poor. All species had "good" to "fair" catch histories. Indices for each species varied in terms of the most representative index; however, index trends were poor for snowy and yellowmouth grouper, and for speckled hind. Composition data (age and/or length) were "good" or "fair" for red drum, lane snapper, wenchman, and Almaco jack, depending on the data source.

Results by Species

Lane Snapper

Several models could be used with lane snapper. Of the six methods attempted, two did not meet performance criteria (CC1 and status quo). Based on how each method affects the projected yield, the four methods which met performance criteria are all projected to keep B_{MSY} above 20% (this theoretically would prevent a population crash). Overall, Itarget1 has a higher probability of preventing overfishing, higher biomass, and better long-term yield, with the trade-off of short-term yield. This index-based model is the one recommended by the analytical team. The remaining three models (Ltarget1, IslopeOFL, and LstepCC1) are also viable, but did not have cumulative performance scores as high as Itarget1. Model averaging could be applied to better balance short-term and long-term management goals. Panelists thought, given that the long-term yield likely harbored the greatest degree of uncertainty, a model averaging approach would likely be necessary for many species to reach a "compromise" between short- and long-term yield.

Wenchman

Three models were attempted for wenchman (CC1, status quo, and IslopeOFL). Catch data revealed that wenchman are primarily caught as bycatch, as opposed to being targeted directly. Catch data were scored as "fair", with the index used for IslopeOFL (small pelagics survey) scored as "good". The status quo method did not meet performance criteria. IslopeOFL was ultimately recommended due to a higher probability of preventing overfishing, higher biomass, less catch variability, and lower probability of biomass dropping below 20% of B_{MSY}. Tradeoffs with this selection are in short- and long-term yields. This method uses the index of abundance to scale catch level recommendations.

Snowy Grouper

No index of abundance is available for snowy grouper, and only the CC1 method and the status quo were analyzed. The status quo method did not meet performance criteria. Initial model estimates predict that snowy grouper may be overexploited. The CC1 method does meet performance criteria; however, it exhibits a 19% chance of the biomass dropping below 20% of B_{MSY}. The CC1 method is considered to be a substantial improvement upon the current management method for snowy grouper.

Speckled Hind

No index of abundance is available for speckled hind, and only the CC1 method and the status quo were analyzed. The status quo method did not meet performance criteria. Initial model estimates predict that speckled hind may be overexploited. The CC1 method does meet performance criteria. The CC1 method is considered to be a substantial improvement upon the current management method for speckled hind.

Lesser Amberjack

An index of abundance was available (SEAMAP Video); however, misidentification issues with greater amberjack are prevalent. The status quo, CC1, and IslopeOFL were attempted, with the status quo and CC1 method failing performance metrics. The IslopeOFL method is recommended over status quo, even though it exhibits a 20% chance of the biomass dropping below 20% of B_{MSY}.

Almaco Jack

The recreational combined index was recommended, with caveats on the length data coming from the recreational fishery. Catch data and the selected index were all scored as "good". Of the several models attempted, the status quo and CC1 failed performance metrics. Of the remaining four attempted models (Itarget1, IslopeOFL, Ltarget1, and LstepCC1), Itarget1 gave a higher probability of long-term yield, higher probability of preventing overfishing, higher biomass, and lower probability of biomass dropping below 20% of B_{MSY}. The tradeoff would be with lower short-term yield; however, a model averaging approach with IslopeOFL may help balance short- and long-term yield tradeoffs between the models.

Red Drum

Catch-, length-, age-, and index-based models were able to be attempted for red drum. Data were scored "good" for catch data, length, and age relationships, with some mean-length estimation attempts rated as "fair". Of the eight assessment methods attempted for red drum, only LstepCC1 met all performance criteria, with the IslopeOFL method just outside of meeting performance criteria (failed yield variability < 15% by one point). This method does result in very low long-term yield estimates, and with no status quo to compare to (the offshore fishery is closed), not many other options remain. The analytical team thinks that the methods need further exploration for red drum, given the available data. In addition, a catch curve analysis was performed on the purse-seine data collected through institutional research studies. The catch curve analysis shows potential low overall mortality for fish spawned since the moratorium, and much higher mortality prior to the moratorium, serving as an indicator for confidence in the data.

Next Steps

Sensitivity runs at variable depletion levels, assessment intervals, and variations in maximum age will be explored. Catch recommendations will be developed based on decisions made by the panel, with information from model runs and model averaging. The sensitivity of these

recommendations to uncertainty will also be characterized.

The next webinar will be held on September 14th.

Participants

Julie Neer	Ryan Rindone	Skyler Sagarese	Bill Harford
Bob Gill	Clay Porch	Damon Morris	Adam Pollack
Jim Tolan	Jeff Mathews	Jeff Isely	Jenny Herbig
Katie Siegfried	Matt Smith	Rich Malinowski	Robert Leaf
Shannon Calay	Adyan Rios	Linda Lombardi	Vivian Matter
David Hanisko	Sue Barbieri	Harry Blanchet	