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Recent projections settings for Gulf species

SEFSC

Gulf Council SSC

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Background

- SEFSC and Council striving for consistent justification for projection specifications
 - Began with SEDAR 70: Greater Amberjack
- Purpose:
 - Review specs used previously
 - Establish a set of best practices



Previous Discussions about Projections Settings

- What is the MSY or its proxy?
 - Use current proxy absent a reason for change
 - Typically $F_{30\%SPR}$ for reef fish stocks
 - SSC has been using $F_{40\%SPR}$ for hermaphroditic groupers
- What level of recruitment should be used into the future?
 - Long term (for OFL):
 - Use stock recruit curve or long-term average
 - Short term:
 - Are recent trends expected to continue?
 - If used for OFL, can be interpreted as support for:
 - A regime shift has occurred
 - Stock productivity has changed



Previous Discussions about Projections Settings

- What selectivity settings are we using?
 - Have regulations recently changed?
 - YES: use years where new management bias applies
 - NO: use average of most recent three years
 - E.g., if 2023 is terminal year, use average of 2021 – 2023
- Which allocations to use going into the future?
 - Model uses allocation from landings fractions up to terminal year
 - Projections (beyond terminal year) can assume a future allocation scenario. Options:
 - Use current sector allocation
 - Generate projections for separate proposed allocation scenarios



Decision:

- Equilibrium projections settings
- Short term catch advice

Parameter	Value	Comment
Relative F	Average from 2016 – 2018	Average relative fishing mortality over terminal three years (2016-2018) of model
Selectivity	Average from 2016 – 2018	Average fleet specific selectivity estimated over terminal three years (2016-2018) of model
Retention	Average from 2016 – 2018	Average fleet specific retention estimated over terminal three years (2016-2018) of model
Recruitment	Average from 2009 – 2018	Average recruitment over last 10 years
2019 Landings	156.907 mt (Commercial Vertical Line), 14.51 mt (Commercial Longline), 22.979 thousands of fish (Charter/Private), 0.99 thousands of fish (Headboat)	2019 landings
2020 and 2021 Landings	184.01 mt (Commercial Vertical Line), 11.891 mt (Commercial Longline), 66.1150 thousands of fish (Charter/Private), 1.377 thousands of fish (Headboat)	Average landings between 2016-2018
Allocation Ratio	27:73	commercial:recreational

Relative Fishing Mortality

- **Best practice:**
 - Use average of the most recent three years
 - E.g., if 2023 is terminal year, use average of 2021 – 2023
- **Consistency:**
 - Used consistently across SEDARs
 - Represents most recent trend in F for forecasting



Selectivity

- Selectivity: the ages and/or lengths of fish actually caught by each directed fleet
 - E.g., private vessel fleet usually catches younger fish than commercial longline fleet
- Consequences:
 - Fixing selectivity assumes static vulnerability across current age and length compositions
 - **Will be violated if future management change causes change in selectivity**
 - Time period matters – if time period is not representative of reality, how stock performs under future Fs will differ from projections
 - E.g., may result in unforeseen changes to SSB if older fish are actually more vulnerable



Selectivity

- Options:
 - Evaluate management bias for recent changes:
 - No change: use average of the most recent three years
 - E.g., if 2023 is terminal year, use average of 2021 – 2023
 - Change: use average of the period representing the change
 - E.g., if new hook requirement implemented in 2022, and 2023 is terminal year, use average of 2022 – 2023
 - Else, if management change happened 3+ years from terminal year, use average of the most recent three years
- Consistency:
 - Used consistently across recent SEDARs
 - Best represents current management bias in fleet-specific selectivity



Retention

- Retention: the ages and/or lengths of fish actually harvested (kept) by each directed fleet
 - E.g., private vessel fleet usually harvests younger fish than commercial longline fleet
- Consequences:
 - Fixing retention assumes static vulnerability to harvest across current age and length compositions
 - **Will be violated if future management change causes change in retention**
 - Time period matters here also

Retention

- Options:
 - Evaluate management bias for recent changes:
 - No change: use average of the most recent three years
 - E.g., if 2023 is terminal year, use average of 2021 – 2023
 - Change: use average of the period representing the change
 - E.g., if minimum size limit increased in 2022, and 2023 is terminal year, use average of 2022 – 2023
 - Else, if management change happened 3+ years from terminal year, use average of the most recent three years
- Consistency:
 - Used consistently across recent SEDARs
 - Best represents current management bias in fleet-specific retention



Recruitment

- Often model derived and not informed by empirical evidence
- Model will adjust recruitment to respond to changes elsewhere
 - E.g., discard mortality, natural mortality, episodic mortality
 - If fish died in the past, they must have been born prior to that, and recruitment will scale to make the math work
- Consequences:
 - Influential for F relative to MFMT, can affect SDC with time
 - Can result in additional uncertainty that may not be completely characterized
 - If recruitment overestimated, stock may decline unexpectedly
 - If recruitment underestimated, projections may result in foregone yield



Recruitment: OFL

- Options: OFL
 - Use stock-recruit curve (most common, historically)
 - Confidence in steepness profile?
 - **Use long-term average (considered more frequently, recently)**
 - **E.g., 1986 – 2023**
 - Use alternative time period:
 - E.g., Gulf Yellowedge Grouper:
 - Used recent 15 years' recruitment for OFL projection due to distrust of earlier recruitment estimates
- Consistency:
 - Varies recently, requires justification



Recruitment: ABC

- Options: ABC
 - Use stock-recruit curve (less common, recently)
 - Confidence in steepness profile?
 - Use long-term average (less common, recently)
 - E.g., 1986 - 2023
 - **Use alternative time period (more common, recently):**
 - **E.g., average of most recent X years (5 years, 10 years, etc)**
 - **SSC typically justifies decision based on other data**
 - E.g., age/length compositions, age frequency, updated reproductive data
- Consistency:
 - Varies recently, requires justification



Interim Landings

- Generally, interim landings are the most recent available
 - Example:
 - Terminal year is 2023, management likely effective 2026
 - Interim years are 2024 and 2025
- Options:
 - **Use finalized landings where available (most common)**
 - **Finalized landings not available: use average of the most recent three finalized years (most common)**
 - Use preliminary landings where available (*not endorsed by Council*)



Interim Landings

- A word on preliminary landings:
 - Per NOAA Office of Science and Technology, should be available within 45 days of the end of an MRIP wave
 - Prior to release, data are available for initial scrutiny by regional review team for about one week
 - Data can remain “preliminary” for several months or longer
 - Preliminary landings data can change substantially before being finalized
 - Changes in these data alter how projections will affect SDC, management
- So... Council decided not to use preliminary landings data in projections.



Sector Allocation Scenarios

- **Best Practices:**
 - No change in allocation expected:
 - Use existing sector allocation scenario
 - Change in allocation is expected:
 - Present existing sector allocation scenario
 - Council provides feedback about expected alternatives
 - SEFSC presents projections using Council alternatives
 - SSC approves OFL and ABC using Council alternatives
 - Council selects preferred allocation alternative, and by default, accompanying OFL and ABC projection
- **Consistency:**
 - Used consistently across recent SEDARs



Sector Allocation Scenarios

- Consequences:
 - Little effect (change) assumed if selectivity and retention are similar across fleets
 - If selectivity and/or retention differ:
 - Difference in OFL/ABC may vary greatly depending on allocation scenario
 - Can affect discard fraction and ultimate estimate of dead discards
 - Not accounting for sector allocation in projections masks potential uncertainty about how fleet-specific selectivity and retention may affect the stock



How far out to project?

- **South Atlantic Council SSC:**
 - Projects up to 5 years out from terminal year
 - Assumes selectivity, retention, recruitment, sector allocations, etc remain unchanged through end of projections
 - E.g., if terminal year is 2023, will accept projections out to 2028

- **Gulf Council SSC:**
 - Projects up to 5 years from beginning of projections period
 - Can result in projections several years beyond terminal year
 - Assumes selectivity, retention, recruitment, sector allocations, etc remain unchanged through end of projections
 - Sometimes issues OFL and ABC advice for 3 year period
 - Revisit? Formalize approach?



Summary of Projections Decisions:

- Relative Fishing Mortality
- Selectivity
- Retention
- Recruitment
- Interim Landings – post-TY, finalized available
- Interim Landings – post-TY, finalized not available
- Sector Allocations
- Duration of Projections



Questions?



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