National Standard 1 – Technical Guidance

Council Coordination Committee
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NS1 Technical Guidance Workgroup

Purpose: Develop technical guidance on specific topics of National Standard 1 (NS1) Guidelines

• Subgroup 1: Reference points (*draft 1 internal review*)
• Subgroup 2: Carry-over and Phase-in (*published July 2020*)
• Subgroup 3: Data Gaps and Alternative Approaches (*published Sept 2022*)
Subgroup 1
MSY Reference Points & Status Determinations
Overview of Document

• Approaches to calculating MSY-related quantities and SDCs
  • Tier 1: Age- or Length structured Assessment Models
    • Direct Estimation of FMSY, MSY, and BMSY
    • Proxies
  • Tier 2: Biomass Dynamics/Surplus Production Models
  • Tier 3: Data-limited Approaches
    • Biological Composition Method
    • Abundance-based Method
    • Catch-only Methods

• Multi-year approach to determine overfishing status
• Overfished and approaching an overfished condition
• Updating reference points and SDCs for prevailing conditions
• Additional Special Considerations

Status: reviewed by Science Centers; Responding to comments
SDC Concepts

- SDC Reference Points for overfishing and overfished conditions work together with Control Rules to provide science-based fishery management
  - Fishing mortality (F) \( \sim \) slope of line relating catch to biomass
  - Higher F causes lower average stock BIOMASS
  - Overfishing occurs when F > Maximum Fishing Mortality Threshold (MFMT) or when catch > Overfishing Limit (OFL)
  - Stock is overfished when B < Minimum Stock Size Threshold (MSST)
Approaches to calculating MSY-related quantities and SDCs: *Age-structured methods*

**Direct Estimation**
- Choosing the SRR functional form and parameterization
- Estimating parameters of the SRR curve
- Using priors for one or more of the SRR parameters

**Data-moderate MSY-based Proxies**
- Proxies for Fmsy: recommended %SPR in range of 30-60%, with default of 40-45% for most stocks
- Proxies for Bmsy: MeanR x SSB/R@Fx%SPR, %B0
Approaches to calculating MSY-related quantities and SDCs: **Biomass Dynamics**

Can be employed when there is:

1. time series of total catch
2. at least one time series of relative abundance data

**Pros**
- minimal data requirements
- simple to implement and to communicate
- straightforward connection to MSY quantities

**Cons**
- cannot account for age-specific fisheries
- Ignores lag effect of recruitment contributing to the spawning biomass
- Cannot project recruitment caused changes
Approaches to calculating MSY-related quantities and SDCs: Data-limited Methods

- Data-limited approaches include: catch-only, absolute abundance, abundance trend, and biological composition (e.g. %SPR) as data categories
- All rely on structural assumptions in order to infer some aspect of status determination; none can do it all
- Previously NMFS has disallowed MSST status determinations from only %SPR calcs
- Now: demonstrate how assumption of quasi-stable stock and fishery provides logical basis by which %SPR, which is a measure of the impact of historical F on current stock’s relative biomass, can be used to make MSST determinations
Updating Ref Pts for Prevailing Conditions

Key Questions:

(1) What is “prevailing conditions” and what factors should be considered in that determination.

(2) Attempt to clarify the conditions and approaches for re-estimation of reference points under changing prevailing conditions.

Recommendations

- Track changes with empirical trailing averages
  - already routinely done for fishery conditions and fish biology
  - recommend extending that logic recruitment also
- If environmental drivers are identified, explore ways to directly incorporate them in the assessment model and resultant SDC ref point updates
- Invoke regime shifts, when demonstrably necessary, as exceptions to that trailing average approach
- Conservation issue: Be cautious of situations that could increase F on a declining stock
- If using a %SPR for the proxy reference points, re-evaluate the choice of %SPR proxy used to ensure it is still consistent with the new perception of the stock's productivity
Additional Special Considerations

- multispecies considerations
- fleet dynamics
- spatial complexity
- density-dependence in other life-history factors beyond stock-recruitment
- size-selective fishing
- age-truncation
- units of reproductive potential
Questions?