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National Standard 1 – Technical Guidance

Council Coordination Committee

Kelly Denit, Richard Methot

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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

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Overview of Document

- Approaches to calculating MSY-related quantities and SDCs
  - Tier 1: Age- or Length structured Assessment Models
    - Direct Estimation of FMSY, MSY, andBMSY
    - 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

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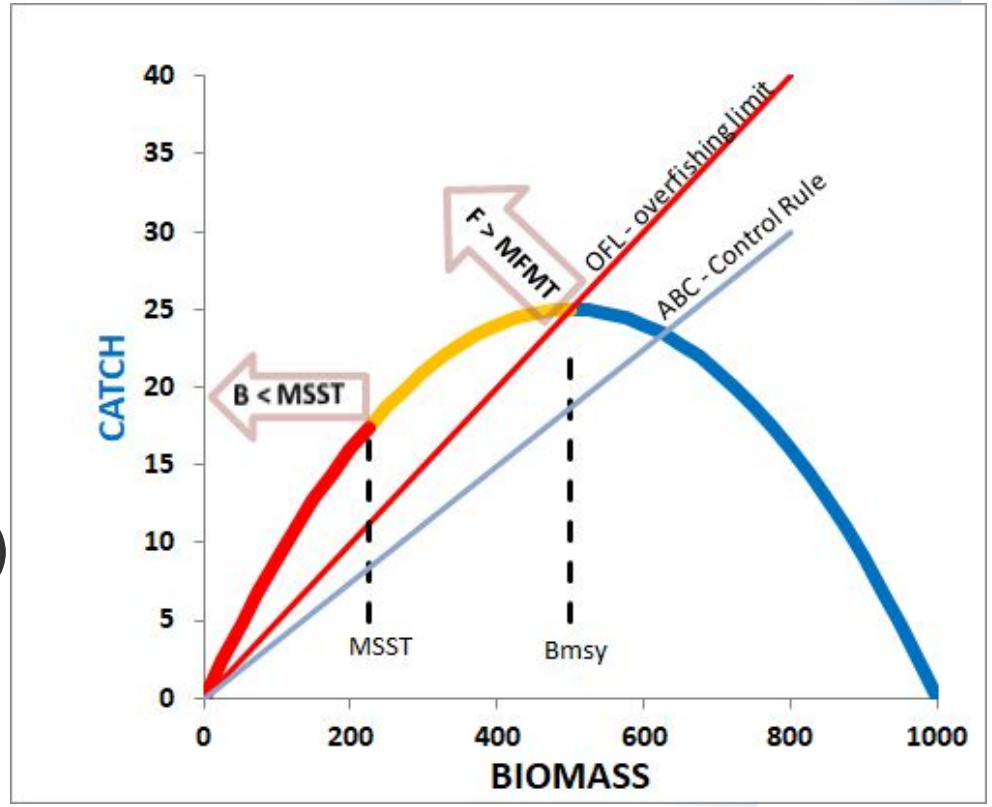
SDC Concepts

- SDC Reference Points for overfishing and overfished conditions work together with Control Rules to provide science-based fishery management
  - Fishing mortality (F) ~ 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

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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

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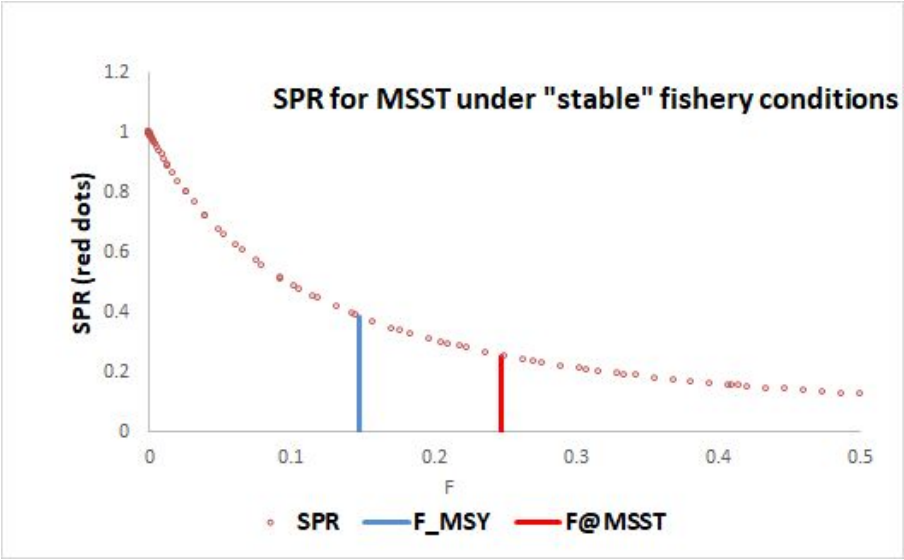
Approaches to calculating MSY-related quantities and SDCs: Data-limited Methods

- 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

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Updating Ref Pts for Prevailing Conditions

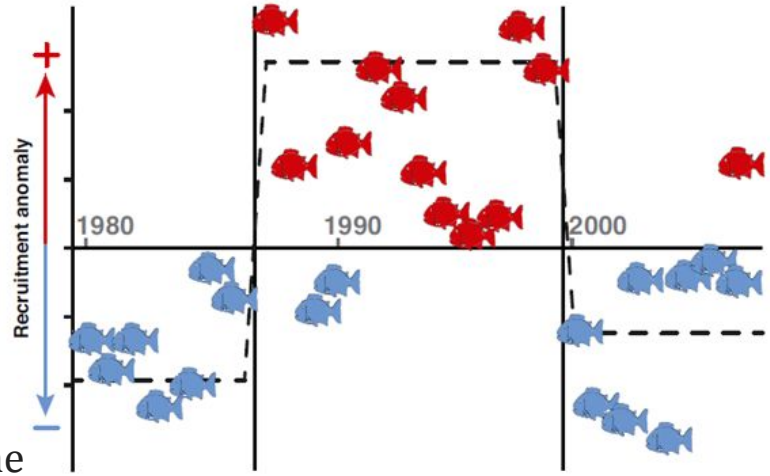
Key Questions:

(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



Recruitment success regimes of fish on the Northeast US Continental Shelf.

Graphic: C. Perretti and S. Schüller

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

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Questions?

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