

Slides relevant to partitioning reference points

(for insertion into P Rago's pptx)

Partitioning reference points (Celestino/Truesdell, 1 of 2)

- Motivation = Council & Policy Board motion:
 - "Move to further develop [Percent change approach, et al.]...Further development should consider, at minimum, F-based approaches..."
- In this context, F-based approaches have been hampered by assessment fishing mortality reference point granularity (total fishing mortality vs sector fishing mortality)
 - Need a benchmark to measure recreational fishing mortality
- Partitioning F_{msy} may provide path forward

Methods, Status, Implications (C&T, 2 of 2)

- Basis for method → rooted in NEFSC (2019) (SARC 66, striped bass)
- Current status = base technical methods developed; SSC review = May 20th +. Additional explorations. Potential implementation methods under development, not yet presented to RMS FMAT/PDT
- Implications/outcomes:
 - Addresses Council/Board motion
 - Potentially obscure to stakeholders (e.g., performance of sector-specific fishing mortality relative to sector allocation of F_{msy})
 - Managers & stakeholders can get closer to having management respond to stock assessments
 - Less reliant on stand-alone MRIP ests, but assessments & their outputs still depend on MRIP

Linking Assessment Models (ASAP, WHAM) to the Recreational Demand Model (RDM) *(Rago, 1 of 2)*

- Not all quotas are created equal.
- F is a vector, not a scalar. Selectivity matters.
- Recent assessment models estimate fishing mortality vectors for Commercial and Recreational fisheries. $\{F_{rec}, F_{com}\}$ $\{Sel_{rec}, Sel_{com}\}$
- Overfishing Limits (OFL) are based on the composite selectivity vector. Commercial and recreational quotas are monitored on the basis of their totals, not their age composition.
- However, a quota consisting of all young fish does not have the same force of mortality on the population as a quota consisting of all old fish.
- The RDM uses ASAP estimates of population numbers at age and length to estimate the expected size and age composition of recreational harvest.

Linking ASAP to RDM (Rago 2 of 2)

- RDM integrates economics, human behavior, and MRIP data to estimate the effects of regulations over multiple jurisdictions to obtain expected age composition of catch, subject to catch $<RHL$.
- The age composition of recreational catch from RDM induces alternative selectivity vectors \mathbf{Sel}'_{rec} AND \mathbf{Sel}'_{com} .
- IF $\mathbf{Sel}'_{rec} \mathbf{b} \neq \mathbf{Sel}_{rec}$ then the basis for setting the quota in the first place is violated. Moreover, these changes will eventually be mirrored in future assessment models.
- Hence a desirable property of RDM estimates is that $\mathbf{Sel}'_{rec} \sim \mathbf{Sel}_{rec}$
- Under these conditions, RDM measures are likely to be consistent with the fishing mortality rates derived from the assessment model. If so, the measures should be consistent over time. Catches will fluctuate with stock size and be less likely to require changes over time.