

# Session 2 Recap

Developing information to support management of interacting species in consideration of ecosystem-based fishery management (EBFM)



# Trigger Question Categories

- Use of ecosystem models to inform management
- Non-target considerations in harvest control rules
- Management framework and system-level considerations

# Summary Points: **RED** Group [Auditorium]

- Use of ecosystem models to inform management
  - Many examples across country of using ecosystem information, model components
  - Need to recognize that application and utility of multi-species/ecosystem models does not need to be just for setting TAC – lots of other benefits and values:
    - Inform changing reference levels/points and total system productivity
    - Time- and age-dependent mortalities developed because of these approaches
    - Assess Climate risks
    - As a cross-check or validation of single species assessments and management advice
- Non-target considerations in harvest control rules
  - No specific examples
    - Spatial management for protected species more common than HCR development
  - Protections to limit forage fisheries
  - This might be a place for the use of MSEs to see which HCRs might be robust to this issues
- Management framework and system-level considerations
  - Limited use of system level caps - more of system of a weakest link under a stock complex that can constrain landing across a complex
  - Use of OFL buffering (e.g.,  $P^*$ , risk assessment) approach to account for multi-species/ecosystem considerations
  - Engaging stakeholders and management in the development of these approaches (MICE examples) can help get buy-in, “peer review”, and integration of information into decisions

# Summary Points: **BLUE** Group [Raven]

## Use of ecosystem models to inform management

- No examples of tactical management using ecosystem models / multispecies models
  - We can do EBFM well without directly using ecosystem models
- Modeling predator-prey interactions to determine prey harvest levels to meet predator needs (herring, menhaden) (MICE)
- Concern that we may not even be including the right species in ecosystem models due to shifting populations

## Non-target considerations in HCRs

- Protected species – WPFMC uses envtl covariates to identify / manage spatial interactions (reduce interactions through avoidance bulletins to fleet, spatial mgmt), NPFMC and PFMC reduce harvest levels to accommodate prey concerns for Steller Sea Lions and So. Resident killer whales
- Forage species – some regions have bans (move to Ecosystem Category, monitoring only, often data-limited)

## Management framework and system-level considerations

- Very few system caps; need to assess ecosystem productivity based on Prim. Prod. & transfer efficiency (large shelf systems / offshore systems) or estimates of total biomass (e.g. multispecies MSY for coral reef systems).
- Alternative management framework for tropical systems with high diversity to use multivariate reference points or 'regions' to define and manage for a desirable state (inability to assess every landed species).
- Adjusting ACLs for 'additional' ecosystem uncertainty (not captured in assessments) using CVs or buffers (risk framework). Currently based on expert judgement, could derive more formal links between risks & size of buffer
- In some cases, ability to implement ecosystem approach affected by multiple management jurisdictions

# Summary Points: GREY Group [Raven]

## Use of ecosystem models to inform management

- Using ecosystem models more as strategic planning tools than tactical management tools
- Some examples of using ecosystem model to derive natural mortality estimates and then plug into stock assessment--no regions really incorporating predation mortality in assessments-
  - Data limitations-very little diet data and when collected not always processed quickly,
  - How much diet data do you need to say anything? Ideally, have time-series, seasonal data but with limited resources is it a priority?
- Ecosystem status reports provide major environmental context for stock assessments in North Pacific
- Difficulty in matching models to management questions

## Non-target considerations in harvest control rules

- Protected species - Steller sea lion closures in Aleutians
- Accounting for whale depredation in sablefish assessment

## Management framework and system-level considerations

- OY cap in Bering Sea
- Utility of a regular forum for regional information exchange of SSC members or Council staff (not just in neighboring Councils) to foster exchange of ideas/methodologies and help bridge information gaps

# Summary Points: **GREEN** Group [Pink Salmon]

## Use of ecosystem models to inform management

- PFMC: Annual State of the California Current Ecosystem reports provide trends of forage species. Some groundfish assessments have used a Lorenzen M positing higher depredation of juveniles. Some salmon analyses factor depredation in salmon total mortality estimates and there is an intent to explicitly account for at least pinniped predation in the foreseeable future.
- WPFMC: EBFM model under development to better understand effects of avoiding protected species interactions and better inform fishery distribution. Ecosystem indicator trends, including trends in forage abundance, are captured in SAFE reports.
- NPFMC: Risk assessments indicating relative abundance of the forage base have been used in management decision-making.
- ASMFC: Single species predator assessments inform Atlantic menhaden assessments.

## Non-target considerations in harvest control rules

- WPFMC: Protected species bycatch drives the management of the longline fishery.
- PFMC: Bycatch caps are used to manage the DGN fishery.

## Management framework and system-level considerations

- NPFMC: 2M mt cap in the Bering Sea is specified for federally managed species.
- PFMC: 2 mt shortbelly rockfish cap is a threshold used to consider more stringent management measures for this EC species.

# Summary Points: **YELLOW** Group [Eagle]

- Use of ecosystem models to inform management
  - Large scale: Menhaden on the Atlantic coast; herring in New England via a harvest control rule
  - Small scale: red tide in the Gulf of Mexico
- Non-target considerations in harvest control rules
  - Few across regions. EcoCast model: can allow for consideration of spatiotemporal interactions between target species and protected species
- Management framework and system-level considerations
  - Cooperative fishers practicing self-management
  - Discussion of struggles with stocks that do not seem to respond to rebuilding plans; also discussion of when reference points should be changed

# Overall Session Findings: Use of ecosystem models to inform management

- EBFM currently works through enhancing / informing single-species assessment models
- Intermediate models to account for predator needs when managing prey species (herring, menhaden)
- Multi-species models & ecosystem models for:
  - estimating predation mortality to inform SS models
  - cross-checking / validating SS models
  - strategic advice (climate context)
- Challenges
  - multi-species / system level reference points
  - data requirements
  - building complex models in a changing climate (non-stationarity, shifting stocks)



# Overall Session Findings: **Non-target considerations in harvest control rules**

- Some considerations for specific protected species issues (e.g. SSL in Aleutians, WPFMC in longline fishery)
- Bycatch caps
- Some considerations across regions on protection for forage fish (ban on directed fishing, caps etc)
- Spatial temporal management for protected species may be more common than HCR development

# Overall Session Findings: Management framework and system-level considerations

- Limited use of system level caps across jurisdictions; BSAI 2 mmt OY cap one example; PFMC EC considerations for shortbelly rockfish species
- Multi species & ecosystem models may help inform system-wide considerations
- Importance of communication between SSCs across regions and stakeholder 'buy-in' particularly on system-level considerations and trade-offs