Risk & Uncertainty Policy: Tautog

Presented to the Tautog Management Board

Tautog Amendment 1

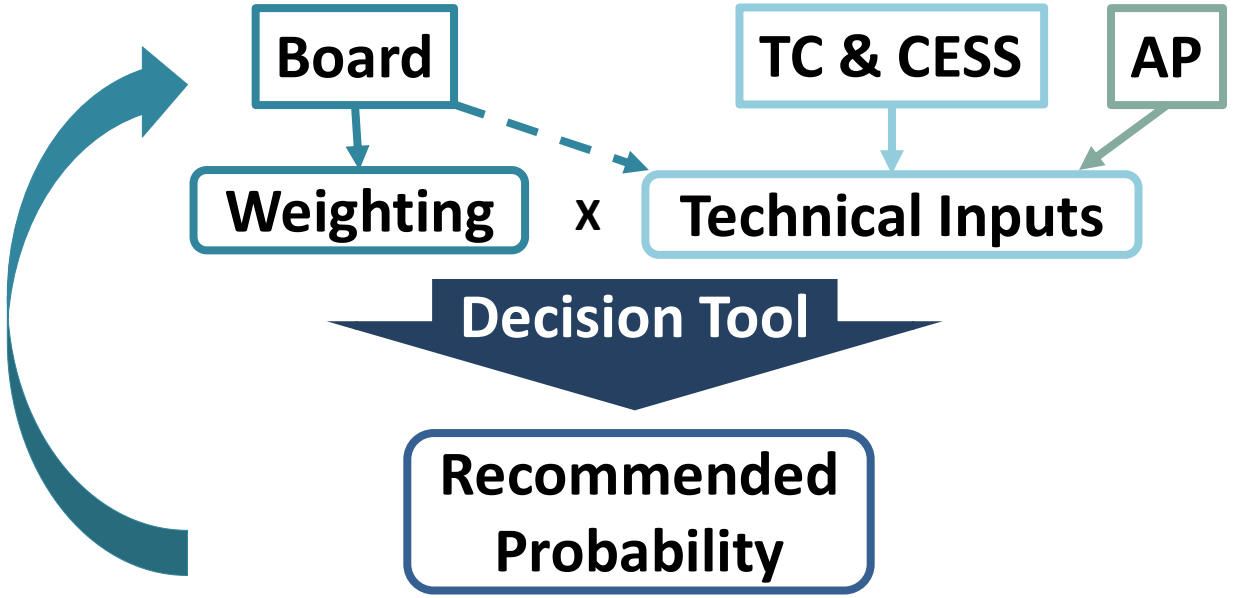
- If the current F exceeds the regional threshold level (overfishing), the Board must initiate corrective action to reduce F to the regional target level, via a management document, within one year of receiving the overfishing stock status

- Management measures will be developed based on at least a 50% probability of achieving F Target.

→ How do we determine the final probability?

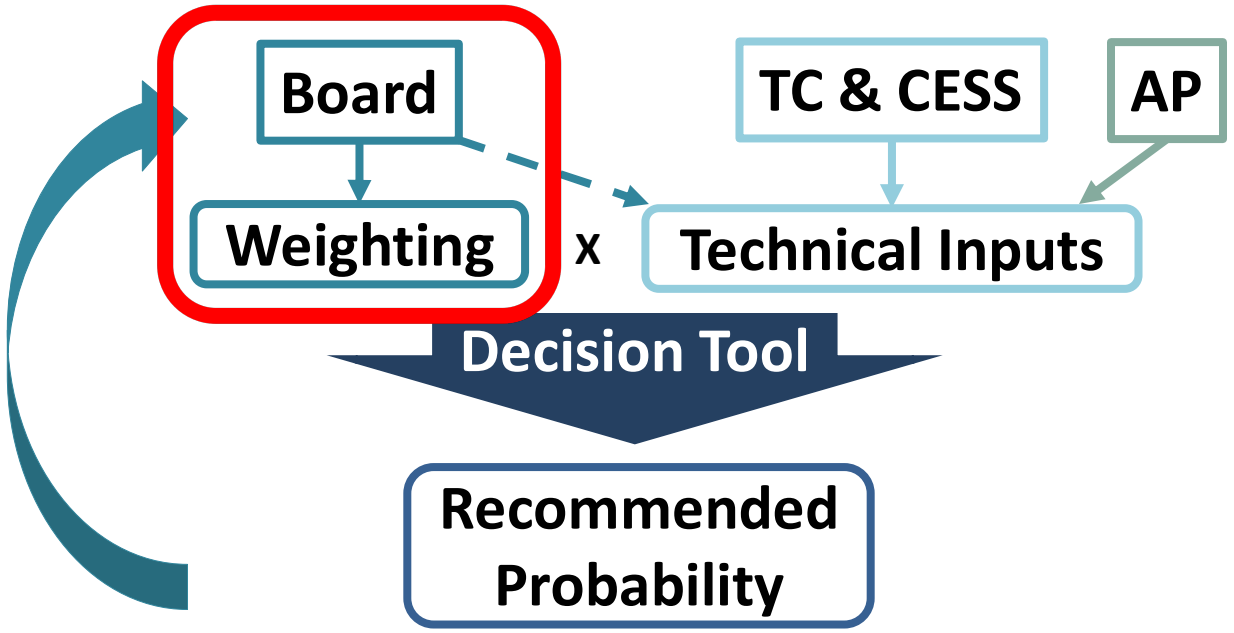
R&U Decision Tool

- The R&U Decision Tool incorporates a variety of information related to risk and uncertainty (technical inputs) and weights the information based on relative importance
- The weighted inputs are combined to produce a recommended probability of achieving F target
- The recommended probability can then be used with projections to develop management options



R&U Decision Tool

- The weightings for the decision tool are the focus of today's discussion
- Board responses to the poll conducted today will be averaged to produce preliminary weightings for the tautog decision tools



Technical Inputs vs. Weightings

- **Technical inputs:** the current status of a component of the biology, ecology, or fishery
  - Scored by the TC/CESS, with additional Board and AP input as needed
  - E.g., a stock status technical input would be the probability that overfishing is occurring
  - E.g., a management uncertainty technical input could be a score of 5 (very high) due to significant illegal fishing activities
- **Weightings:** how important each of the technical inputs are to Board risk considerations
  - Based on Board preferences
  - E.g., if the Board considered stock status to be twice as important as management uncertainty, stock status could be weighted twice as much as management uncertainty

R&U Decision Tool

More Precautionary

Less Precautionary

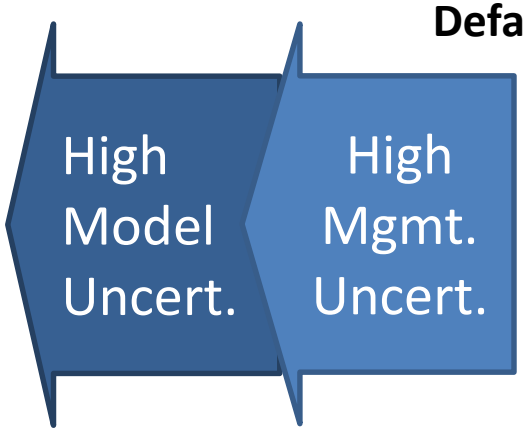
Higher probability of achieving F target, lower TAC

Default: 50%

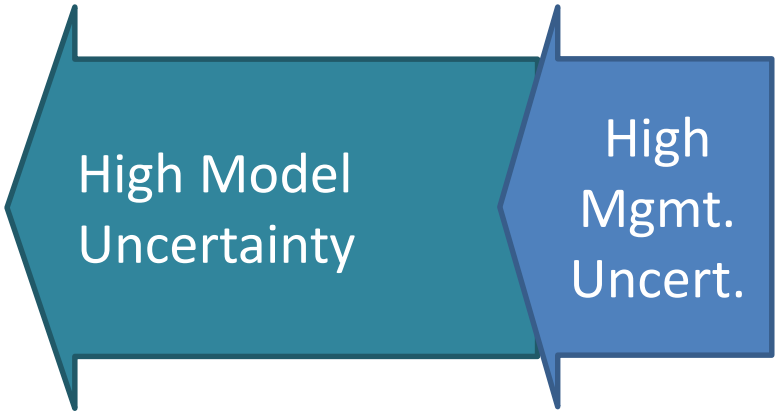
Lower probability of achieving F target, higher TAC

- Stock Status
- Model Uncertainty
- Mgmt. Uncertainty
- Envir. Uncertainty
- Ecosystem Importance
- (LT) Socioeconomic / (ST) Socioeconomic

R&U Decision Tool Example



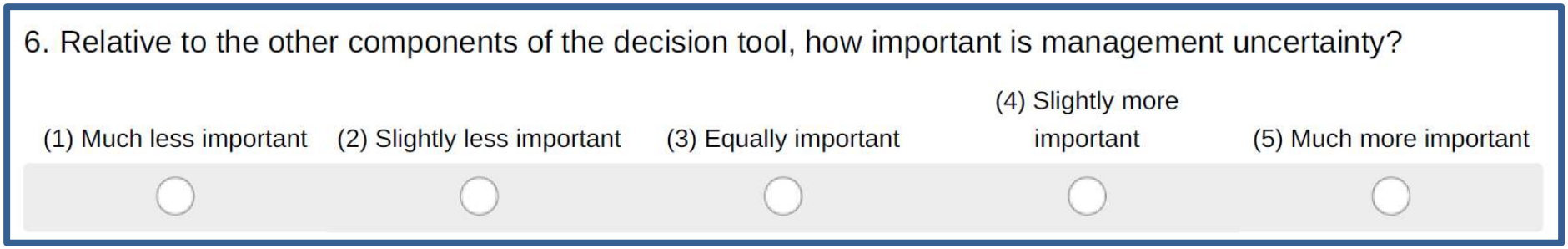
Default
(equal weight)



Model Uncertainty 2x weight of management uncertainty

Weighting Input Process

- We will work through the components of the decision tool one-by-one, following the process below:
  1. Review the type of information used for the technical input
  2. Answer Board questions about that component
  3. Fill out poll for that component
- Each poll question will ask Board members to rate the importance of that component (e.g., management uncertainty) relative to the other components of the decision tool
  - If you would like all components of the decision tool to be weighted equally, answer all survey questions with **"Equally important" (3)**
- Scores will be averaged to produce preliminary weightings



R&U Decision Tool

Category	Decision Tool Component	Default Weight
Stock Status	SSB above or below the threshold	0.1
	SSB above or below target	0.1
	F above or below the threshold	0.1
	F above or below target	0.1
Additional Uncertainty	Model uncertainty	0.1
	Management uncertainty	0.1
	Environmental uncertainty	0.1
Additional Risk	Ecosystem/trophic importance	0.1
Socioecon.	Short-term commercial socioeconomic effects	0.1
	Long-term commercial socioeconomic effects	0.1
	Short-term recreational socioeconomic effects	0.1
	Long-term recreational socioeconomic effects	0.1

Stock Status

- Technical Component: Is the stock below the biomass threshold?
  - Technical Input: the probability (from the stock assessment) that the stock is below the biomass threshold

- Weighting Question: Relative to the other components of the decision tool, **how important is whether or not the stock is below the biomass threshold?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Stock Status

- Technical Component: Is the stock below the biomass target?
  - Technical Input: the probability (from the stock assessment) that the stock is below the biomass target

- Weighting Question: Relative to the other components of the decision tool, **how important is whether or not the stock is below the biomass target?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Stock Status

- Technical Component: Is fishing mortality above the threshold?
  - Technical Input: the probability (from the stock assessment) that fishing mortality is above the threshold

- Weighting Question: Relative to the other components of the decision tool, **how important is whether or not fishing mortality is above the threshold?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Stock Status

- Technical Component: Is fishing mortality above the target?
  - Technical Input: the probability (from the stock assessment) that fishing mortality is above the target

- Weighting Question: Relative to the other components of the decision tool, **how important is whether or not fishing mortality is above the target?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Model Uncertainty

- Technical component: how much model uncertainty is there?
  - Technical input: qualitative score based on information such as retrospective patterns, sensitivity runs, model fits, model parameter precision, and sensitivity to starting values

- Weighting question: relative to the other components of the decision tool, **how important is model uncertainty?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Management Uncertainty

- Technical component: how much management uncertainty is there?
  - Technical input: qualitative score based on information such as past management performance, illegal fishing activities, ability to regulate removals, ability to monitor the fishery, compliance

- Weighting question: relative to the other components of the decision tool, **how important is management uncertainty?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Environmental Uncertainty

- Technical component: how much environmental uncertainty is there?
  - Technical input: qualitative score based on information such as environmental drivers of recruitment, habitat loss, climate change vulnerability, predator/prey dependence, and natural mortality not accounted for in the assessment model

- Weighting question: relative to the other components of the decision tool, **how important is environmental uncertainty?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Ecosystem/Trophic Importance

- Technical component: how important is tautog to the ecosystem or other key species?
  - Technical input: qualitative score based on tautog's role in maintaining other key species (e.g., other important fished species or threatened or endangered species), ecosystem services, and ecosystem function

- Weighting question: relative to the other components of the decision tool, **how important is ecosystem/trophic importance?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Short-term Commercial Socioecon.

- Technical component: what is the short-term socioeconomic effect of the proposed management change on the commercial fishery?
  - Technical input: score based on total ex-vessel value, community dependence indicator, the scale of the potential management change (% change to harvest produced by other components of the decision tool), and the anticipated effect on the community
  - typically, harvest reduction = a ST negative effect
  - Typically "pushes back" on the recommended probability

- Weighting question: relative to the other components of the decision tool, **how important are short-term socioeconomic effects on the commercial fishery?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Long-term Commercial Socioecon.

- Technical component: what is the long-term socioeconomic effect of the proposed management change on the commercial fishery?
  - Technical input: score based on total ex-vessel value, community dependence indicator, the scale of the potential management change (% change to harvest produced by other components of the decision tool), and the anticipated effect on the community
  - typically, harvest reduction = a LT positive effect
  - Typically adds to the recommended probability

- Weighting question: relative to the other components of the decision tool, **how important are long-term socioeconomic effects on the commercial fishery?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Short-term Recreational Socioecon

- Technical component: what is the short-term socioeconomic effect of the proposed management change on the recreational fishery?
  - Technical input: score based on total directed trips, community dependence indicator, the scale of the potential management change (% change to harvest produced by other components of the decision tool), and the anticipated effect on the community
  - typically, harvest reduction = a ST negative effect
  - Typically "pushes back" on the recommended probability

- Weighting question: relative to the other components of the decision tool, **how important are short-term socioeconomic effects on the recreational fishery?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Long-term Recreational Socioecon.

- Technical component: what is the long-term socioeconomic effect of the proposed management change on the recreational fishery?
  - Technical input: score based on total directed trips, community dependence indicator, the scale of the potential management change (% change to harvest produced by other components of the decision tool), and the anticipated effect on the community
  - typically, harvest reduction = a LT positive effect
  - Typically adds to the recommended probability

- Weighting question: relative to the other components of the decision tool, **how important are long-term socioeconomic effects on the recreational fishery?**

(1) Much less important	(2) Slightly less important	(3) Equally important	(4) Slightly more important	(5) Much more important

  - Note: to indicate that you would like all components to be weighted equally, score all components as a 3

Next Steps

- Average scores from Board members to produce preliminary weightings
  - To be reviewed by the Board for discussion and potential approval at the Annual Meeting
- Compile preliminary R&U report with technical inputs from the TC/CESS
  - To be reviewed by the Board at the Annual Meeting