Proposed Allocation Decision Trees:
A Draft Blueprint for Applying Biological, Social, and Economic Considerations in Allocation Decisions

Socio-Economic Panel

April 2022

Working group includes Dr. Mike Schmidtke, Christina Wiegand, John Hadley, Dr. Scott Crosson, and Myra Brouwer

Request of the SEP

1) Consider the revised decision tree questions that focus on social and economic topics.

2) Provide feedback on the Fishery Performance Review questions and the proposed public input tool.

Introduction

- Increased attention on sector allocations.
  - A report from the GAO recommended that the Councils consider sector allocation needs using:
    - *Trends in catch and landings*
    - *Stock assessment results*
    - *Economic analyses*
    - *Social indicator analyses*
    - *Ecosystem models*
  - Revised method for estimating recreational landings.
    - The "currency" has changed for how landings are accounted for.
- <u>Landings</u> have been the primary data source used for allocation purposes.
  - The most consistently available data.
  - Available for all species.

Background

- Council is now reconsidering sector allocations as new catch level recommendations from the SSC are implemented.
  - Accommodate current needs of the fishery.
    - Revised recreational landings data due to change from CHTS to FES methodologies.

- **Goal** is to help the Council develop an approach to addressing allocation decisions that applies a consistent method across all species.

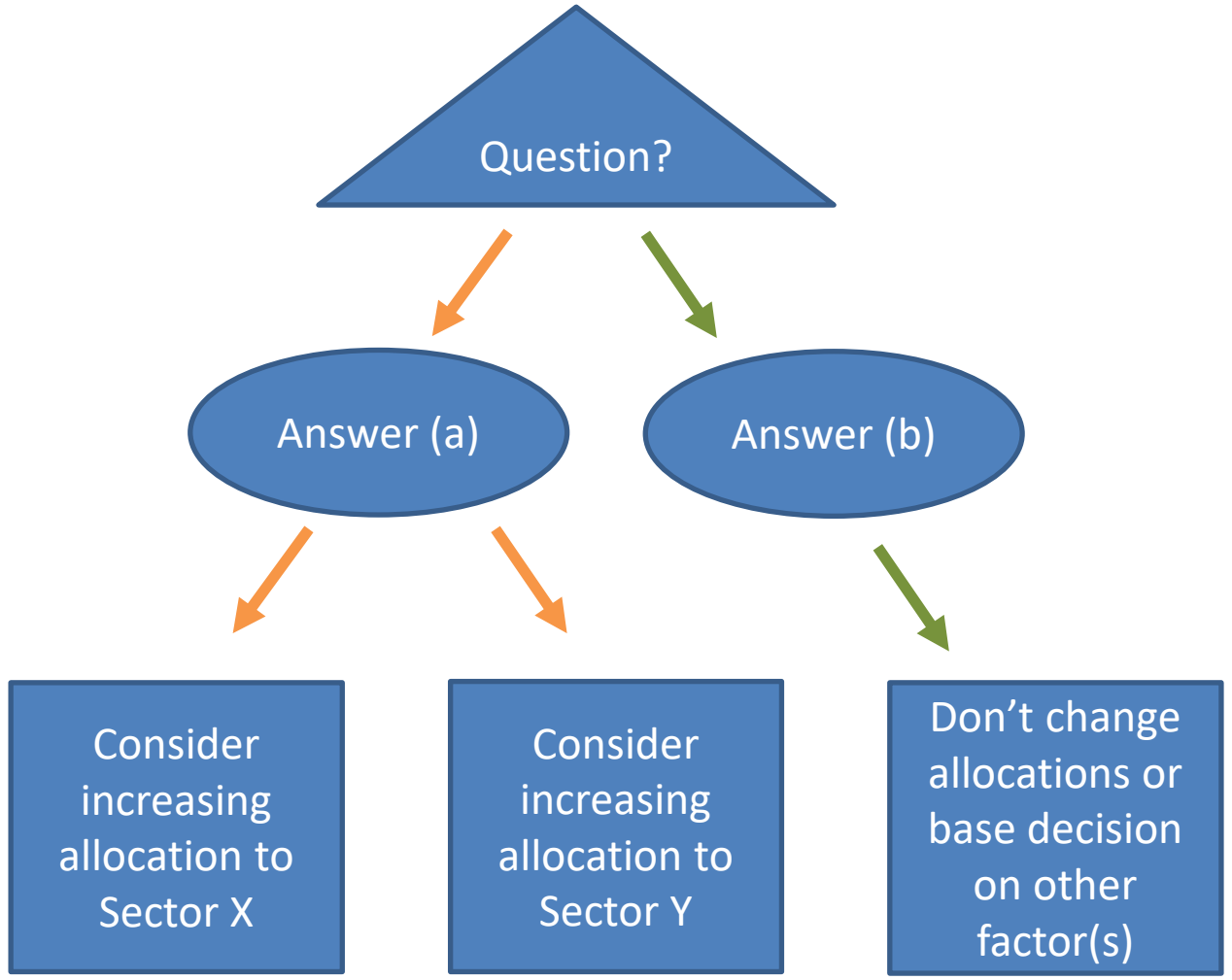
Development and Review

- Decision tree developed and draft has undergone extensive review.
- Revisions made to address comments and concerns along the way.

- SEP and SSC: April 2021
- SERO and SEFSC: July 2021
- Council AP Chairs: August 2021
- "Light" Council Review: September 2021
- In-depth Council Review: February/March 2022
- **Application of the "tool" towards Spanish Mackerel: December 2022**

What is the Decision Tree Approach?

- Uses the same question pattern, or "tree" for each species considered.
  - Currently 4 major decision trees being developed.
- As a question is answered, the tree "branches", or directs to the next question to be answered.
- Intended to aid the Council in making decisions such as whether allocations need to be considered in an amendment, initial structuring of allocation alternatives, and help build rationale.



Draft Allocation Decision Trees

- The allocation decision tree categories are topics identified by the Council:
  1) Landings and discards
  2) Stock status
  3) Economic factors
  4) Social factors

- Each species would pass through all decision trees.
  - Some decision trees may not provide a relevant outcome for a given species.
  - A question in one decision tree could be applicable to another tree too.

Questions?

- Any questions on the general decision tree approach before we dive in the topic-based questions?

Economic Questions

Economic Importance: Is the relative economic importance of the species changing?

Answers:

1. **Yes. Is it becoming more economically important?**
   a. **Becoming more important to one sector.** *Prioritize reallocation towards the sector for which the species has a higher economic importance.*
   b. **Becoming more important to both sectors.** *Consider maintaining current allocations or basing changes to allocations on other factors.*
2. **No.** *Consider maintaining current allocations or basing changes to allocations on other factors.*

Table 3.3.1.4. Number of vessels and dockside revenues by year for vessels that landed blueline tilefish from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught blueline tilefish	Gross ex-vessel revenue from blueline tilefish	Gross ex-vessel revenue from 'other species' jointly caught with blueline tilefish	Gross ex-vessel revenue from 'other species' caught on SATL trips without blueline tilefish	Gross ex-vessel revenue from all species caught on Gulf trips	Total gross ex-vessel revenue	Average total gross ex-vessel revenue per vessel
2012	125	$730,580	$1,122,941	$7,389,313	$598,485	$9,841,319	$78,731
2013	129	$620,582	$1,752,682	$7,813,566	$193,055	$10,379,885	$80,464
2014	138	$398,833	$1,684,712	$9,802,364	$522,476	$12,408,385	$89,916
2015	124	$233,927	$1,062,592	$8,120,484	$822,735	$10,239,738	$82,579
2016	155	$356,290	$2,017,875	$9,269,234	$813,393	$12,456,792	$80,366
Average	134	$468,042	$1,528,160	$8,478,992	$590,029	$11,065,224	$82,411

Source: SEFSC Coastal Fisheries Logbook (Accessed June 2018).

Table 2. Top ten species managed by the South Atlantic Council ranked by directed recreational fishing trips and by weight of recreational landings, average from 2016-2019.

Top Ten Species by Directed Trips	
Species	**Directed Trips[1,2,]**
Dolphin	938,251
Spanish Mackerel	866,158
King Mackerel	474,676
Gray Snapper	444,020
Shadow Shark	417,566
Yellowtail Snapper	352,616
Black Sea Bass	203,718
Mutton Snapper	163,440
Wahoo	96,688
Gray Triggerfish	84,595

Top Ten Species by Weight of Harvest	
Species	**Pounds Landed (ww)**
Dolphin	6,537,000
Shadow Shark	1,662,074
King Mackerel	1,455,438
Wahoo	1,282,298
Spanish Mackerel	1,054,063
Greater Amberjack	1,040,608
Yellowtail Snapper	792,158
Gray Snapper	604,224
Mutton Snapper	536,164
Red Snapper	355,073

Analysis for Economic Importance

- Potential analysis:
  - Logbook information to determine commercial importance through a comparison of gross revenue from a species to total revenue.
  - Potentially compare directed effort for all SAFMC-managed species in the appropriate region as a proxy for recreational importance.

Trends in Demand for the Species: Are there indications of notable trends in demand for the species?

Answers:

1. **Yes. What is the trend by sector?**
    a. **Demand is increasing in both sectors.** *Consider maintaining current allocations or basing changes to allocations on other factors.*
    b. **Demand is increasing for one sector and not the other.** *Prioritize reallocation towards sector that is exhibiting increasing demand.*
2. **No.** *Consider maintaining current allocations or basing changes to allocations on other factors.*

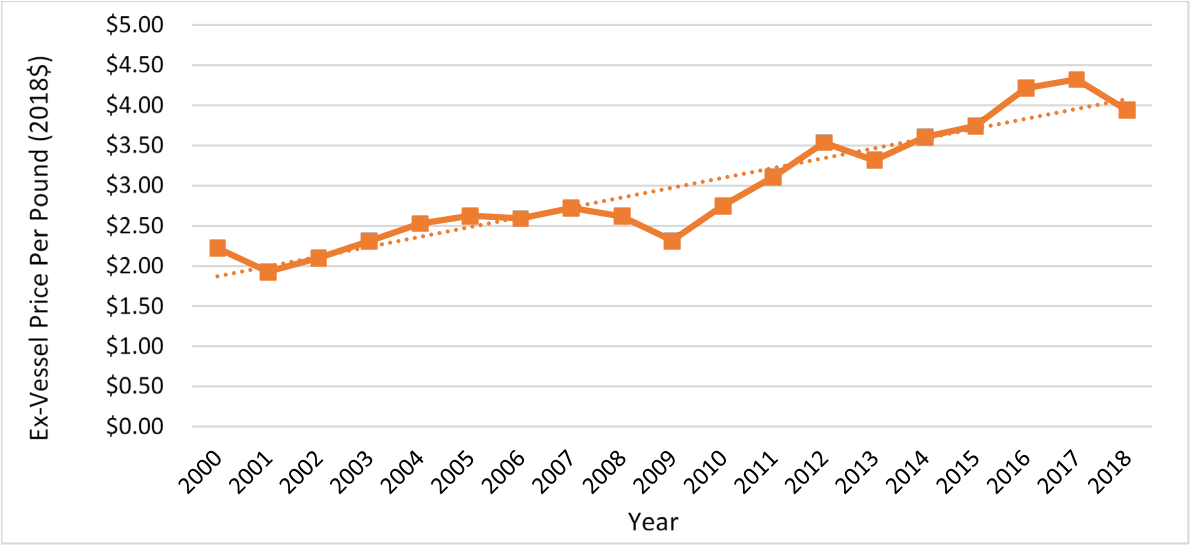


Figure 3. Ex-vessel price for Shadow Shark landings, 2000-2018 (2018 dollars).

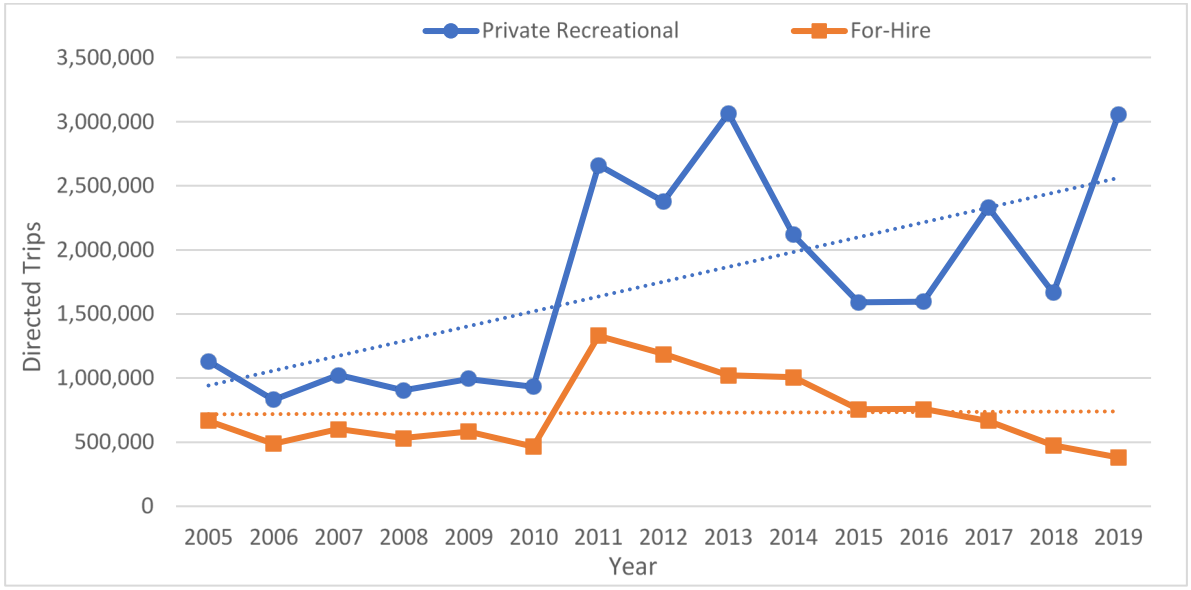


Figure 4. Directed recreational Shadow Shark trips, 2005-2019.

Analysis for Trends in Demand for the Species

- <u>Potential analysis</u>:
  - Use the following as proxies for demand:
    - Trends in ex-vessel price and landings for the commercial sector.
    - Trends in directed effort and landings for the recreational sector.
    - Fishery performance reports.

Trends in Demand for Quota: Has a sector fully harvested its ACL on a consistent basis?

Answers:

1. **Yes, only one sector.** *Prioritize reallocation towards the sector that would likely benefit from additional ACL.*
2. **Yes, both sectors.** *Consider maintaining current allocations or basing changes to allocations on other factors.*
3. **No.** *Consider maintaining current allocations or basing changes to allocations on other factors.*

Analysis for Trends in Demand for Quota

Year	Commercial ACL (lbs ww)	% Commercial ACL	Recreational ACL (lbs ww)	% Recreational ACL
2019	153,935	101%	115,315	85%
2018	144,315	105%	116,317	86%
2017	144,315	102%	114,983	85%
2016	135,380	100%	124,819	92%
2015	125,760	119%	144,483	107%

- Potential analysis:
  - Historical use of sector ACLs if appropriate.
  - Projected use of new sector ACLs under the status quo allocation percentage, particularly if the methodology for estimating landings has recently changed.

Social Questions

Fishery Dependance: Among the top ten counties with the highest proportion of total [landings, trips, permits] in the region, are most of them engaged in commercial fishing, recreational fishing, or both??

(Counties are considered highly engaged if they are above the one standard deviation threshold).

Answers:

1. **Most are highly engaged in commercial fishing.**
   a. **Are commercial fishermen in those counties dependent on the resource for their livelihood (above the median local quotient)?**
      i. **Yes**. *Consider prioritizing commercial fishing opportunities.*
      ii. **No**. *Review fishing opportunities for associated species and consider whether adjustments to topic species allocations are necessary.*
2. **Most are highly engaged in recreational fishing.**
   a. **Are recreational fishermen in those counties dependent on the resource (above the median number of directed trips)?**
      i. **Yes**. *Consider prioritizing recreational fishing opportunities.*
      ii. **No**. *Review fishing opportunities for associated species and consider whether adjustments to topic species allocations are necessary.*
3. **Equally engaged in commercial and recreational fishing**. *Consider removing sector allocations or allocating equally between the sectors.*

Analysis for Fishery Dependence

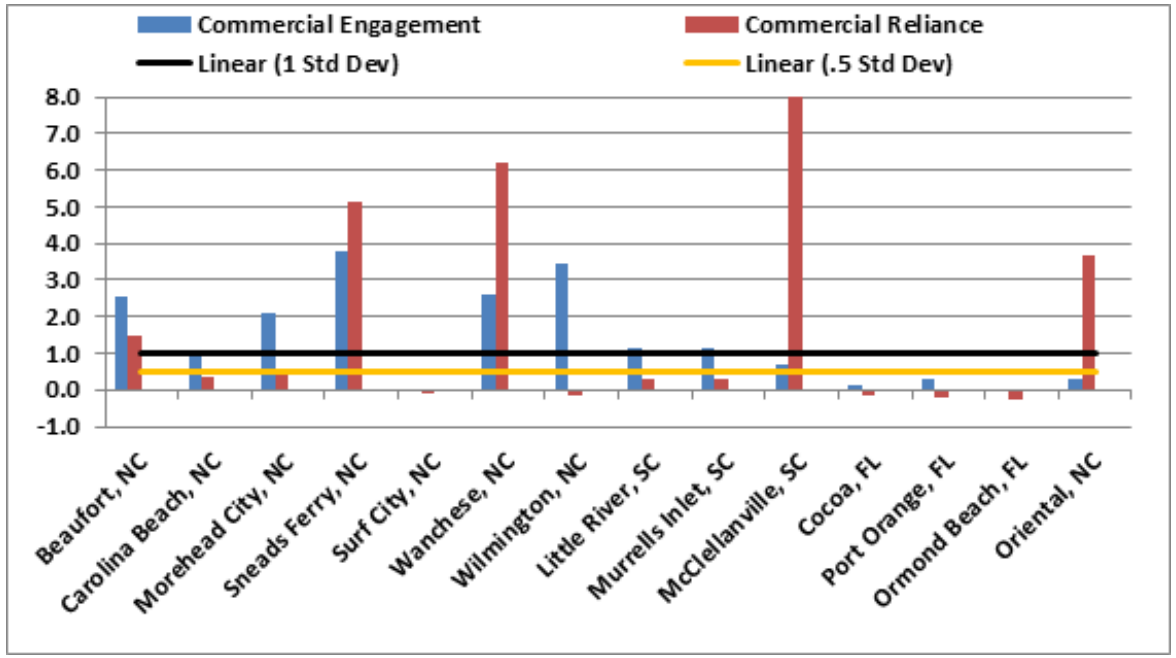


Figure 5. Commercial fishing engagement and reliance for top Shadow Shark fishing communities.

- Potential analysis:
  - Social indicators, including commercial and recreational fishing engagement, regional quotient, and local quotient.

Cultural Importance: Does the fishery play a unique role in the history of fishing communities?

Answers:

1. **Yes. Does the fishery play an important role in community cultural tradition?**
    a. **Yes. Have changes in the regulatory environment effected the role this species plays in communities?**
        i. Yes. *Consider allocations that mirror the historical real or de facto allocations and/or current values in the fishery.*
        ii. **No.** *Consider allocations that prioritize economic, biological, or ecosystem needs.*
    b. **No.** *Consider allocations that mirror the historical real or de facto allocations.*
2. **No.** *Consider allocations that reflect the current state of the fishery and would allow for growth and adjustment.*

Analysis for Cultural Importance

Photo Credit: John Carmichael

- <u>Potential analysis:</u>
  - Summary of information provided in fishery performance reports.
  - Available demographic data.
  - Informed judgement.

Working through the Decision Tree

1) Council staff will gather appropriate information.
   - Will be presented in a Shiny app, similar to the fishery overviews that have been presented at recent Council meetings.

2) Staff will develop preliminary responses and move the Council through the decision tree.
   - Results will be compiled in a decision tool.

3) Council members will be able to clarify the outcomes of each decision point and asked to address any subjective outcomes.

Working with the results

- Possible that not all decision trees are going to have input every time for every species.

- Not likely that all decision tree "branches" will point to the same sector allocation recommendation.
  - Assign no rank or weighting
    - Maintains flexibility.
    - Evaluate allocation decisions on a species by species basis.
  - The Council will resolve conflicting allocation recommendations on a case by case basis.
    - Outcomes of the decision tree can be used to help the Council develop a range of alternatives.

Greater Amberjack Example

- Council staff will work through an example using greater amberjack.
  - Fishery Overview
  - Decision Tool

Feedback and Discussion on Economic Questions

1. **Content:** Keeping in mind the need to focus on readily available data and completion of the decision tree in a relatively short time (several weeks to a few months), are the economic questions adequate?
   a) Given the relative lack of specific and dynamic information on demand, is the use of proxies appropriate? If not, are there recommendations for solutions or other sources of information that could be used and applied in a time-sensitive manner?

2. **Outcomes:** Are the resulting recommendations from the economic decision trees appropriate? Will they help guide allocation decisions without being too prescriptive?

Feedback and Discussion on Social Questions

1. **Content:** Does the SEP feel that the outlined data analyses are adequate? Are there other readily available analyses or data sources that should be examined?

2. **Presentation:** Given the need to complete any decision tree related analysis in a short amount of time, what is the best way to summarize and present available qualitative data?

3. **Outcomes:** Are the resulting recommendations from the social decision trees appropriate? Are they clear enough to guide allocation decisions without being too prescriptive?