

South Atlantic Dolphin Management Strategy Evaluation

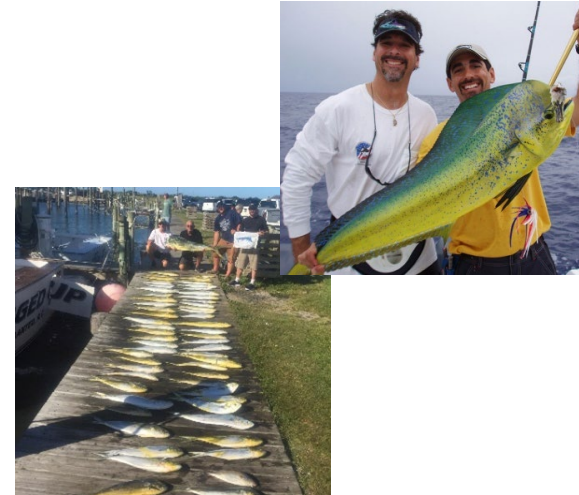
SEFSC

Dolphin MSE talk outline

1. Project goals & objectives
2. Status, timeline, funding, personnel
3. Plans to overcome the current impediments to an assessment, such as the lack of survey and biological data, international migrations, and international landings
4. Definition of “management procedures”
5. MSE within the MSA process of developing scientific advice, setting catch levels and developing management actions (e.g., will it provide support for an ABC? Stock status criteria and status determination?)
6. Project deliverable
7. Stakeholder participation and involvement
8. Support requested of the Council and Council staff and role of APs and the SSC
9. Future outlook

1. Project goals & objectives

- Dolphin challenges the best assessment+projection paradigm
 - Highly migratory, internationally exploited, large recreational fishery,
 - Highly productive w/ strong environmental influence
 - Short lifespan, especially with respect to data-management lag e.g. almost all are dead by the time management would be in action
 - Likely not a unit-stock within Council jurisdiction
- Builds upon stakeholder participatory workshops (McPherson, Karnauskas, et al., 2022; Tech Memo)
 - Differing perspectives on local abundance
 - Regional trends in fishery objectives
- Necessitates another look at current management practices



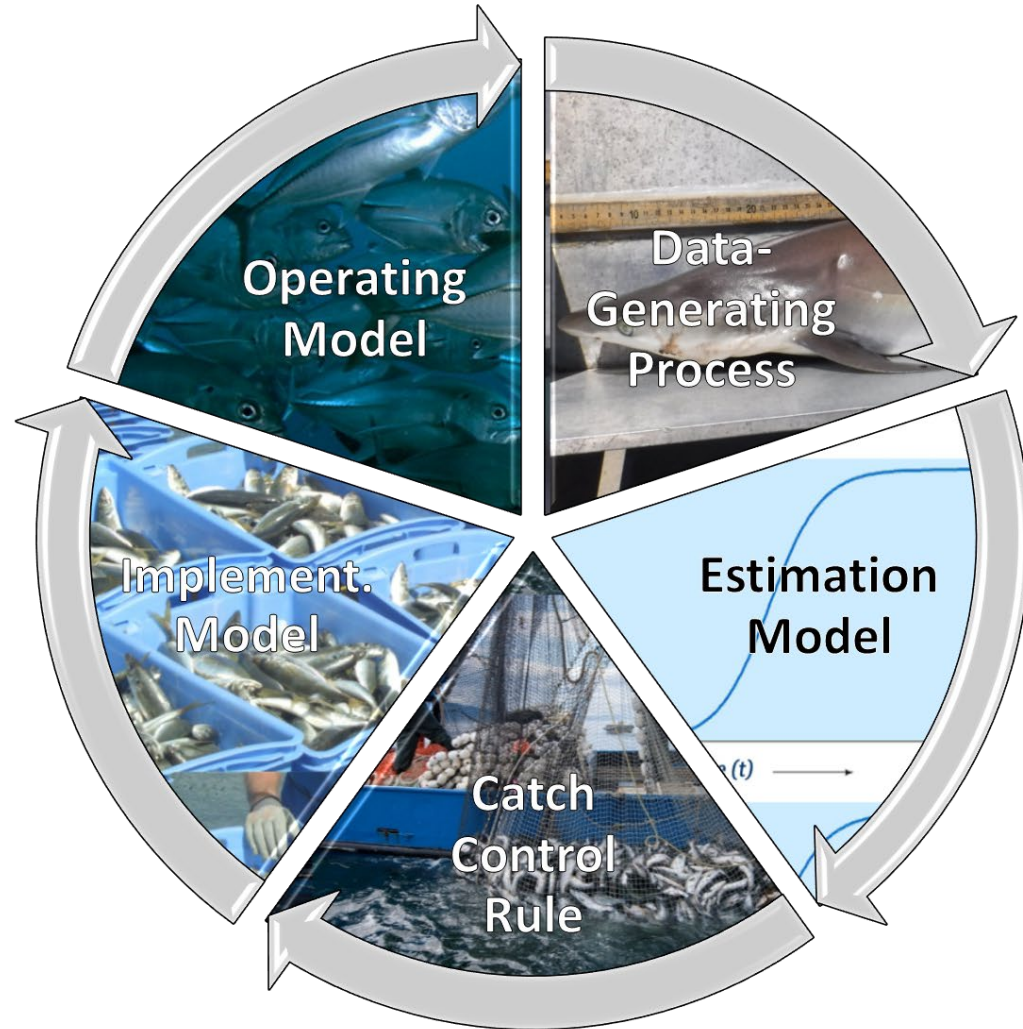
Project Goal: Develop an empirical (e.g. index-based) management procedure to provide ABC and OFL advice that best achieves the multiple operational management objectives of the fishery.

Management strategy evaluation (MSE)

Framework to develop and test management procedures using closed loop simulation

Considers trade-offs in fishery management by measuring MP performance based on multiple objectives

“Stress test” the robustness of a management procedure to many uncertainties



2. Status & Timeline

Beginning stages of MSE conceptualization and model development

Planning stakeholder workshops (to be held starting in 2022)

Peer-review TBD

| Time | Action |
|--------------------|--|
| 2020-2021 | Dolphin Wahoo Participatory Workshops to define conceptual management objectives |
| Summer/Fall 2022 | Public meetings to get management objectives <ul style="list-style-type: none">- also consider uncertainties and MPs- Identify 'hard' operational management objectives for any dimension if possible/necessary |
| Fall 2022 | Build/condition OMs |
| Fall 2022 | Build MP-feedback loop |
| Winter/Spring 2023 | Finalize MSE design (sign off on OM grid and structure, data sources, assumptions, suite of candidate MPs, etc.) |
| Winter/Spring 2023 | Initial MSE runs |
| Spring 2023 | Revisit stakeholders <ul style="list-style-type: none">- Present management tradeoff space- Refine operational objectives |
| Spring/Summer 2023 | Tune MP to meet/maximize operational objectives |
| Summer 2023 | Summarize & write up results |
| Fall 2023 | Follow up with / present results to stakeholders |

Dolphin Wahoo Participatory Workshops

NC/VA Workshops - 2020

Beaufort, NC – March 9

7 participants (for-hire, private)

Wanchese, NC – March 10

14 participants (commercial, for-hire)

Virginia Beach, VA – March 11

4 participants (for-hire, private)

Florida Workshops - 2021

Scheduled for summer 2020; postponed due to COVID; decision to go virtual

One-on-one phone calls - March 2021

12 participants (for-hire, private)

Group webinar – April 12

9 participants (for hire, private)

2. Personnel (so far) & Funding

- MSE led by Matt Damiano (NCSU; NMFS-SeaGrant Pop Dy Funded)
- With contribution from Jie Cao (NCSU; MARFIN-funded), Cassidy Peterson, Kyle Shertzer, Mandy Karnauskas, Matt McPherson (SEFSC-funded), Wess Merten (Beyond Our Shores; volunteer)
- SEFSC has funding for stakeholder workshops

Leveraged research

- Stakeholder participatory workshops (SEFSC & SAFMC)
 - conceptual management objectives
 - Local ecological knowledge & Social media analyses: fishing seasonality, temporal abundance trends, fishery drivers
- Spatiotemporal distribution using VAST modeling analyses (Matt Damiano et al.)
- Long-term tagging program (Wess Merten Beyond Our Shores)

3. Plans to overcome impediments to an assessment, such as the lack of survey and biological data, international migrations, and international landings

- Key aspect of this MSE is to develop CPUE indices from commercial longline or recreational datasets, which could inform an eventual assessment
- Karnauskas et al. explored international landings, substantial removals come from U.S. fisheries
- Infrastructure for international management does not currently exist- so the goal of this MSE is to best manage what nature (or international fisheries outside of our control) give us
- Possible developments at WECAFC may address dolphin in the greater Caribbean; e.g. formation of a dolphin-flyingfish WG

4. Definition of “management procedures”

- Fishery management “thermostat”
 - A pre-defined process used to adaptively manage living marine resources
 - Designed to achieve specific management objectives (e.g., maximize catch, minimize risk to resource, maintain catch stability, maximize catch rate, etc)
 - MP defines the entire ‘recipe’ for setting the ABC as well as for the management action such as spatial/fleet allocations, size/bag limits, etc
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- **Empirical MPs** – management procedures that are ‘model-free’ or do not use a population model to estimate stock status, but rather use an indicator from resource monitoring data (e.g., catch-per-unit-effort, mean size, etc.) to adjust allowable catch from year-to-year.



5. Management procedures within the MSA framework

Q1: Would MPs provide stock status determination criteria?

- With regard to biomass, not necessarily. Often science does not support MSY-based status: *“When data are not available to specify SDCs based on MSY or MSY proxies, alternative types of SDCs that promote sustainability of the stock or stock complex can be used....If alternative types of SDCs are used, the Council should explain how the approach will promote sustainability of the stock or stock complex on a long term basis.”* Open question as to whether a simulation-tested management procedure is sufficient to demonstrate that it will achieve desired status.
- With regard to F; if catch > OFL, then overfishing determination can be made

Q2: How does an MP explicitly account for multiple (often competing objectives) within MSA

- MSA specifies *“Optimum yield as the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems; that is prescribed on the basis of the MSY from the fishery, as reduced by any relevant economic, social, or ecological factor;”*
- Within OY there is substantial room for considering multiple objectives.

5.cont. Management procedures within the MSA framework

Q3: How would an MP work in practice?

- At predetermined intervals the MP 'recipe' would be followed, e.g. the CPUE indicator would be used to update ABC/OFL and the management actions (spatio-temporal-sectoral allocations or others) applied.
- Once MP adopted it would be nearly automatic and the ABC and OFL would be adjusted based on the index.
- Fishery management plan may need to fully specify the MP to allow this to be most efficient with minimal delays and additional rulemaking.

5.cont. Management procedures within the MSA framework

Q4: How does MSE and the resulting MP advice get peer reviewed to ensure compliance with NS2 and BSIA?

- Not fully sorted out, but either Center for Independent Expert review or SSC could review
- Once MP adopted the actual resulting ABC/OFL advice might only need cursory SSC review to ensure that extraordinary circumstances* did not apply

*extraordinary circumstances: provisions specified in the Fishery management plan that define when the Management procedure can be overridden, such as inability to update an index, environmental conditions outside of those tested in the MSE, etc.

5.cont. Management procedures within the MSA framework

Q5: Would stock assessments still be conducted?

- Not necessarily, management procedures could provide sufficient management advice for many species such as dolphin
- For stocks with existing assessments, routine, but less frequent assessments could still be conducted as health or status checks or to inform MSE reconditioning (e.g. fitting in new data, groundbreaking science, etc.)

6. Project deliverable

Empirical management procedure to adaptively manage dolphin through regular OFL/ABC adjustment that achieves stakeholder-defined management objectives. The MP would modify the previous ABC/OFL based on the indicator and then apply the simulation-tested management action that could involve allocations, bag or size limits and other, to be determined, actions. It would be designed to have a high probability of meeting management objectives.

Four typical objectives:

Status - a certain probability of $B > B_{msy}$ and $F < F_{msy}$

Safety- high probability of being above a biomass limit threshold

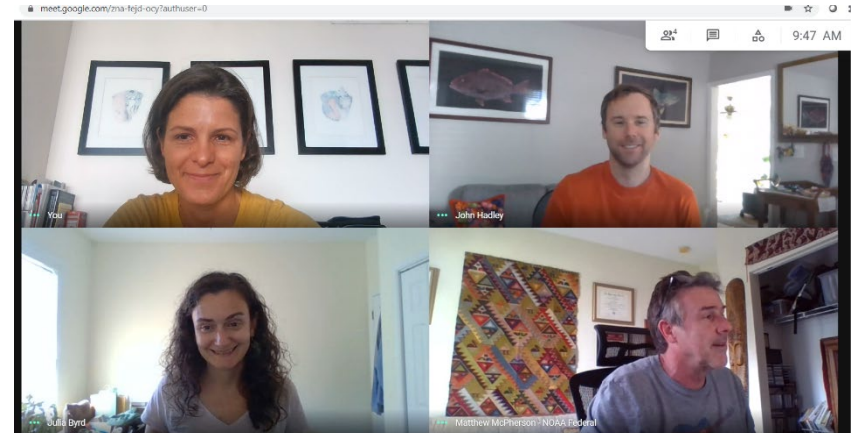
Yield- maximize catch, catch rate or 'quality catch'; objectives likely differ between commercial or recreational and by state (some may desire high CPUE; others desires yield)

Stability- fishery stability is usually valued by commercial fishery, stability of opportunity may be valued by other fisheries. Usually a low probability of fishery closure (e.g. the antithesis of stability and yield) is desirable.

7. Stakeholder involvement

Stakeholder involvement in MSEs is required to:

- Specify conceptual (what do people want- a good trip) and operational (e.g. 60 dolphin with X% probability on each trip) management objectives
- Identify system uncertainties to which management procedure should be tested
- Provide guidance on management procedure specifications



Proposed process for soliciting “funneled” stakeholder input

Workshop 1: Broad workshop

- Open to all interested parties
- Break-out groups for sector-specific discussions
- Objectives:
 - Define conceptual management objectives
 - Receive feedback on proposed candidate MPs
 - Clarify any fishery/stock uncertainties that should be addressed within MSE
- Multiple regional workshops

Equitably select few representative stakeholders for continued involvement

Workshop 2+: Focused workshops

- Small group selected from workshop 1
- Meeting objectives
 - Refine management objectives from conceptual to operational objectives
 - Requisite input to refine candidate MPs, as necessary
 - Allowable TAC restrictions, daily bag limit restrictions, closed area limits, fishing season maximum/minimum length, etc.
 - Prioritize management objectives for weighting resulting MPs
 - Overall stakeholder perspectives on MSE

Follow-up Presentation

- Present results of MSE to participants and deliver materials

8. Support requested of the Council and Council staff

We seek a collaboration in management procedure development

- No immediate funding requested
- Co-host stakeholder meetings
- Convene dolphin **MSE panel**** with stakeholders, APs, SSC, Council staff, SEFSC staff, outside experts?

- *How would the Council like to be involved?*

****MSE panel**, a group of dedicated individuals from diverse groups who will follow the entire process and act as ambassadors for it. The Council and Science Center would work together to ensure all interested stakeholder groups are represented.

9. Future Outlook

Council adopts an MP that reflects interannual variability in dolphin, avoids closures and localized depletions and equitably allocates fish

Who updates it? Likely SEFSC will maintain the index and will update the MP (likely annually)



Discussion Topics

How would the Council like to be involved in dolphin MSE?

Would the Council like to formally appoint an **MSE panel** supporting this effort? How will group members be equitably and representatively appointed?