Exploring Alternate Methods for Estimating Recreational Landings for Rarely Encountered Species

M. Allen, G. Bray, L. Hollensead, Z. Siders

- Traditional creel surveys are not designed to reliably estimate landings for relatively rare species
  - Low detections, private landing sites, etc.
  - High uncertainty in landings (often exceeds tolerance on PSE)

- This is not a criticism of the design overall, which provides estimates of common species with adequate precision for management (in general)

- Alternate methods for estimating recreational landings are needed for assessment

Table 1. Deepwater Grouper (Yellowedge, Snowy, Warsaw, and Speckled Hind) by state and year for the past decade. Data are **numbers of fish** sampled.

State	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
AL	5	2	2	1	7	4	4	4	7	1
Gulf FL	24	4	10	18	4	6	7	12	3	10
MS	0	1	3	1	0	0	0	0	0	0
LA (LA Creel)	45	5	57	54	39	23	23	20	37	89
TX (TX creel)	0	2	6	2	0	1	2	6	1	0

Objectives

1) Explore methods that could be used to provide improved estimates of recreational landings for relatively rare species

2) Provide a framework for estimating uncertainty around those landings

This Presentation

Two challenges:

1) **Describe methods that could be used to provide better estimates of recreational landings and associated uncertainty than current surveys**

2) Explore the management feasibility challenges to implementation

Here we are focusing on the first one, what are methods that would provide better estimates than status quo?

- Goal of this analysis was to explore options for voluntary or mandatory reporting strategies to improve estimates of recreational landings for rarely detected species with relatively low fishing effort.

- For use in assessments, currently little info on recreational landings

- Extensive work exists on voluntary reporting apps and estimation methods
  - Designs have been worked out by NOAA OS&T

- Challenge is to correct the reported landings (either mandatory or voluntary) for non-reporting rate

Potential Methods

- Identify the pool of anglers seeking these fish with a required stamp or registration
  - Boat captain registration or all anglers?
  - **Key step**, identify the anglers targeting these fish

- Initiate voluntary (or mandatory) reporting of landings from recreational trips, with incentives
  - Phone app, basic information of trip duration, number of anglers, and harvested catch by species in the deepwater grouper complex

- Estimate reporting rate with uncertainty
  - Quantify expected uncertainty in reporting rates
    - Assess reporting rate for high-reward versus low-reward tagging studies
    - Evaluate the use of follow up surveys of reporting rates from the DWG anglers (e.g., did you report catches this year?, How many trips, etc.)
    - Potential for questions in dockside surveys about reporting, to estimate fraction of trips reported

Hypothetical Example

- Reported Catch
- Reporting rate
- **Estimate of Total Catch**

$$\frac{\textit{Reported Catch}}{\textit{Reporting Rate}} = \textbf{Total Catch Estimate}$$

$$\frac{1000\ fish}{0.25} = 4{,}000\ \text{fish}$$

Estimate used in stock assessment and management

Reporting rate could be informed by multiple data sources and would include uncertainty.

Hypothetical Example

- Pool of anglers is 5,000 from DWG “stamp” or “permit”

- Voluntary reporting of trips through a phone app
  - In Year 1, data from 125 trips (total catch 12,000 lb)
  - Year 2, 180 trips (total catch 18,000 lb)
  - Year 3, 165 trips (total catch 17,000 lb)

- The challenge is to extrapolate this to the unreported trips.

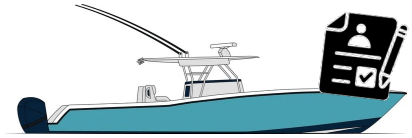
- Reviews indicate that reporting rates with no rewards vary from 3-15% of trips, averaging 8% reporting rate. This could be based on law enforcement interactions, dockside interviews, follow up surveys, and meta-analysis of high-reward tagging studies for other reef fish species (Gag, Red Grouper, etc.)

Example Results

Year	Reported Catch (lb.)	Estimated Landings (lb)	Lower Bound	Upper Bound
1	12,000	150,000	80,000	400,000
2	18,000	225,000	120,000	600,000
3	17,000	212,500	113,333	566,667

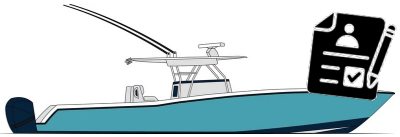
- Upper and lower bounds estimated with the uncertainty in the reporting rate
- Precision likely to be substantially better than current MRIP estimates for this complex
- First set up as an index, and work toward reporting rate estimation for total estimates

Registration



Gives pool of ***N* captains**

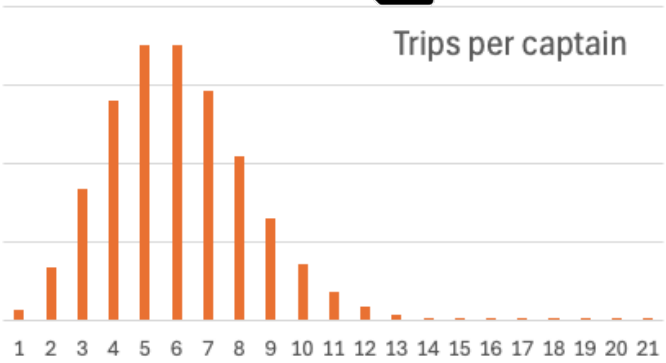
Registration

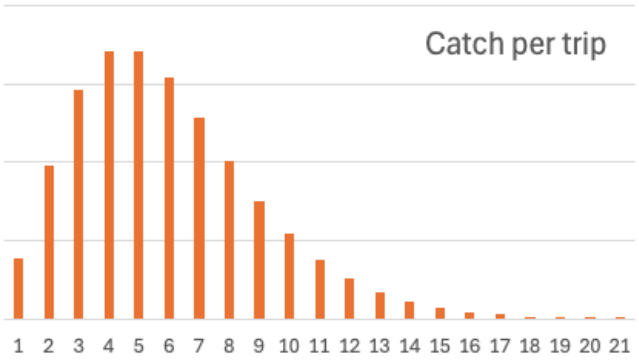


Gives pool of ***N* captains**

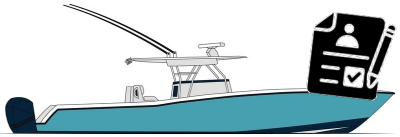
Some **%**
report

Reporting over time





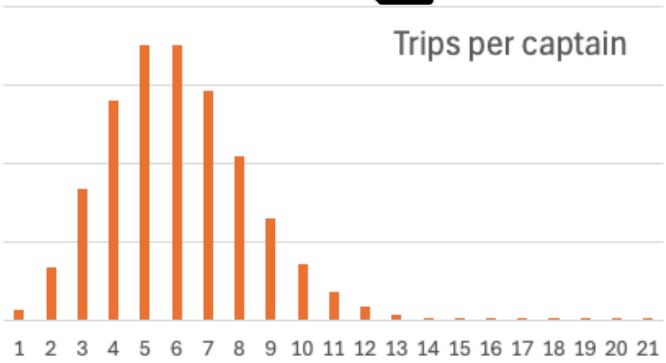
Registration

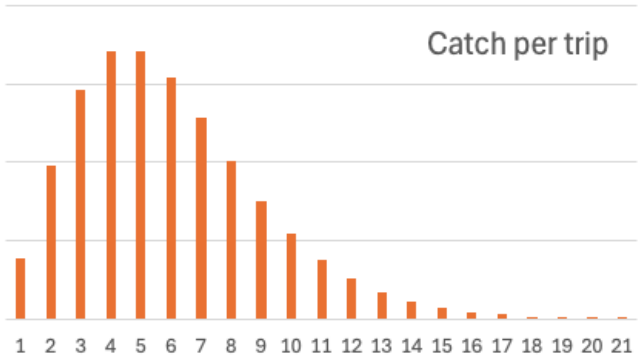


Gives pool of ***N* captains**

Some **%** report

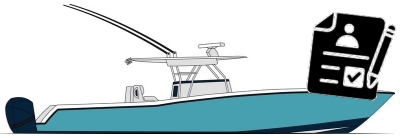
Reporting over time





Total Reported Catch

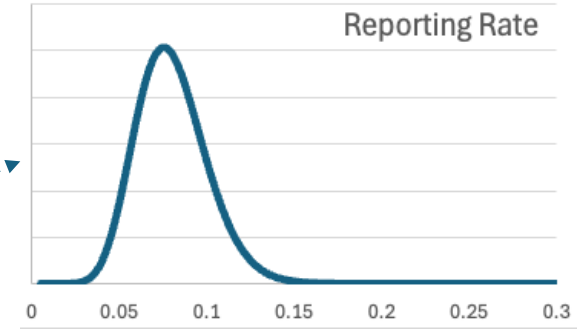
Registration



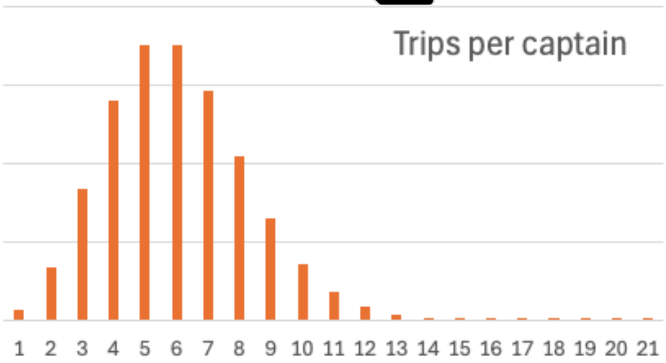
Gives pool of ***N* captains**

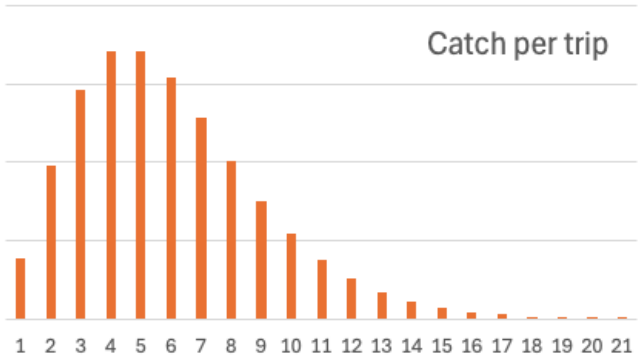
Some **%** report

Review, survey, or intercepts



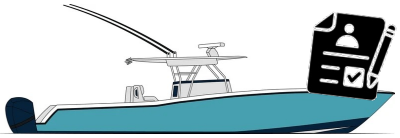
Reporting over time





Total Reported Catch

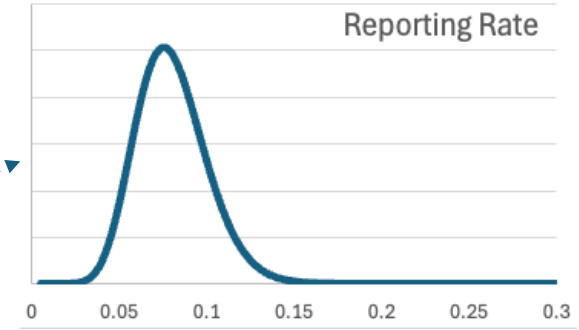
Registration

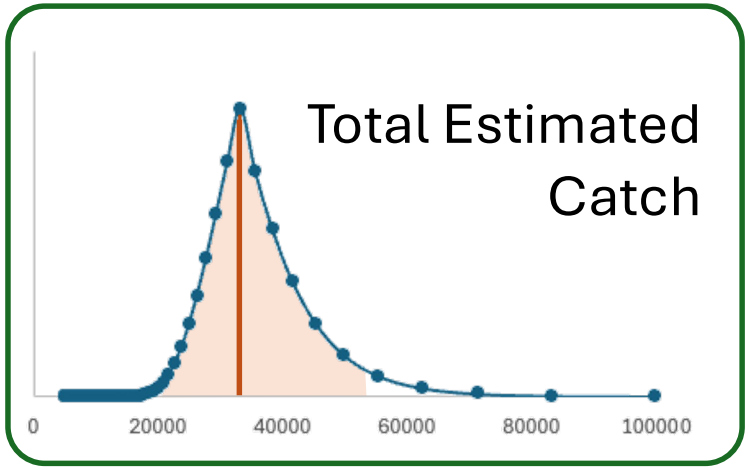


Gives pool of ***N* captains**

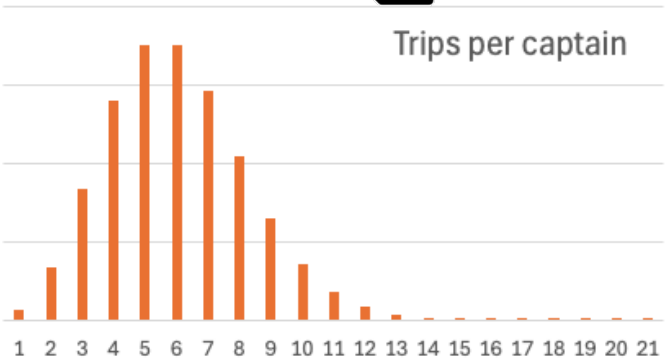
Some **%** report

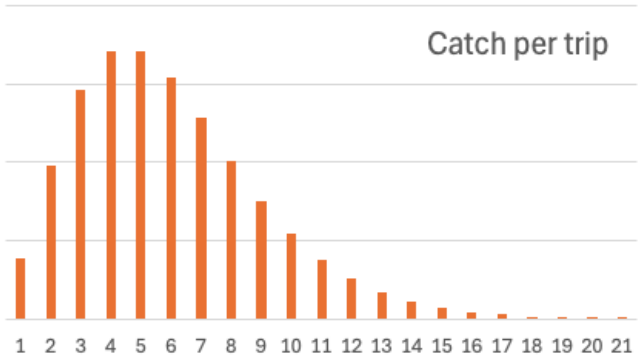
Review, survey, or intercepts





Reporting over time





Total Reported Catch

- Such a strategy would likely provide better estimates than traditional angler-catch survey approaches for rarely encountered species
- Working with the DWG anglers will be essential
- There are challenges, but this framework has potential for success
- Discussion

Thank you!