

Specialized Survey Methods for Recreational Reef Fish Fisheries in Florida

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Reef Fish Surveys in Florida

- For-hire observer surveys (2009-2018)
 - Detailed trip data, discard size distribution, discard condition and survival
 - Used by SEDAR
- For-hire electronic logbook reporting (2010)
 - MRIP pilot study for federally permitted vessels
 - Demonstrated regional coordination
- EFL Red Snapper mini-seasons (2012-2017)
 - Precise catch and effort estimates for PR mode
 - Peer-reviewed (N. American J. Fish. Mgt., 2017)
 - Used by SEDAR and for ACL monitoring



Gulf Reef Fish Survey (GRFS)

- Two Workshops in 2014
 - Reviewed methods for other Gulf states
 - Census reporting (MS, AL), voluntary reporting (TX)
 - Require survey design to account for under-coverage
 - Survey (LA)
 - Met with MRIP statisticians
 - Identified issues for Florida
 - Large geographic area, large number of access points
 - Diverse species and distribution
 - Large number of participants across Florida and out of state
 - Discussed options for statistically valid survey design
 - Florida initiated new survey in May 2015



Why use integrated approach?

- MRIP survey is important for many species
 - State managed inshore stocks
 - Other federally managed stocks beyond reef fishes
- Not feasible to replace MRIP in Florida
 - New general survey would likely have same issues for reef fishes
 - Would break historic time series for all species
- Integrated approach allows us to use data already collected through MRIP, and collect additional information needed for reef fishes



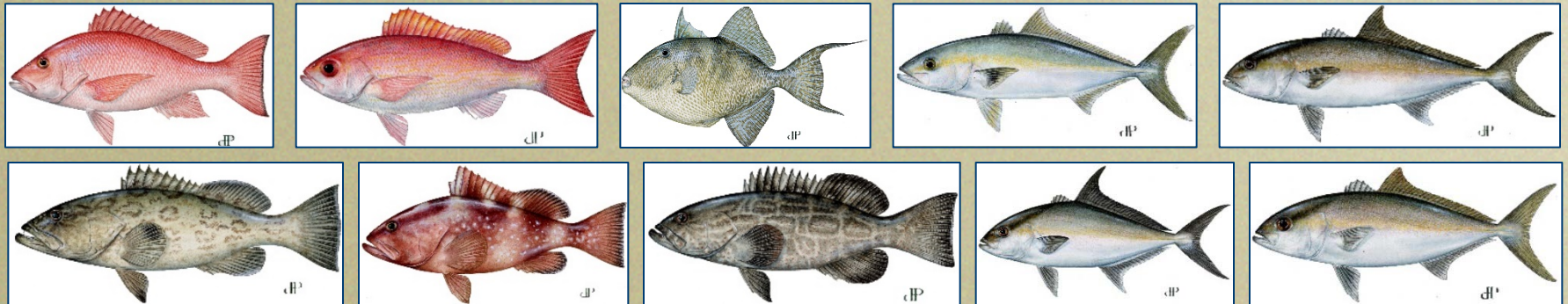
Integrated Approach

- Improve reef fish intercepts in MRIP's APAIS
 - New offshore site group
- Supplement APAIS with specialized private boat intercept survey
- New mail survey directly estimates private boat angler trips for reef fishes
 - Monthly estimates by state and federal waters



Gulf Reef Fish Angler Designation

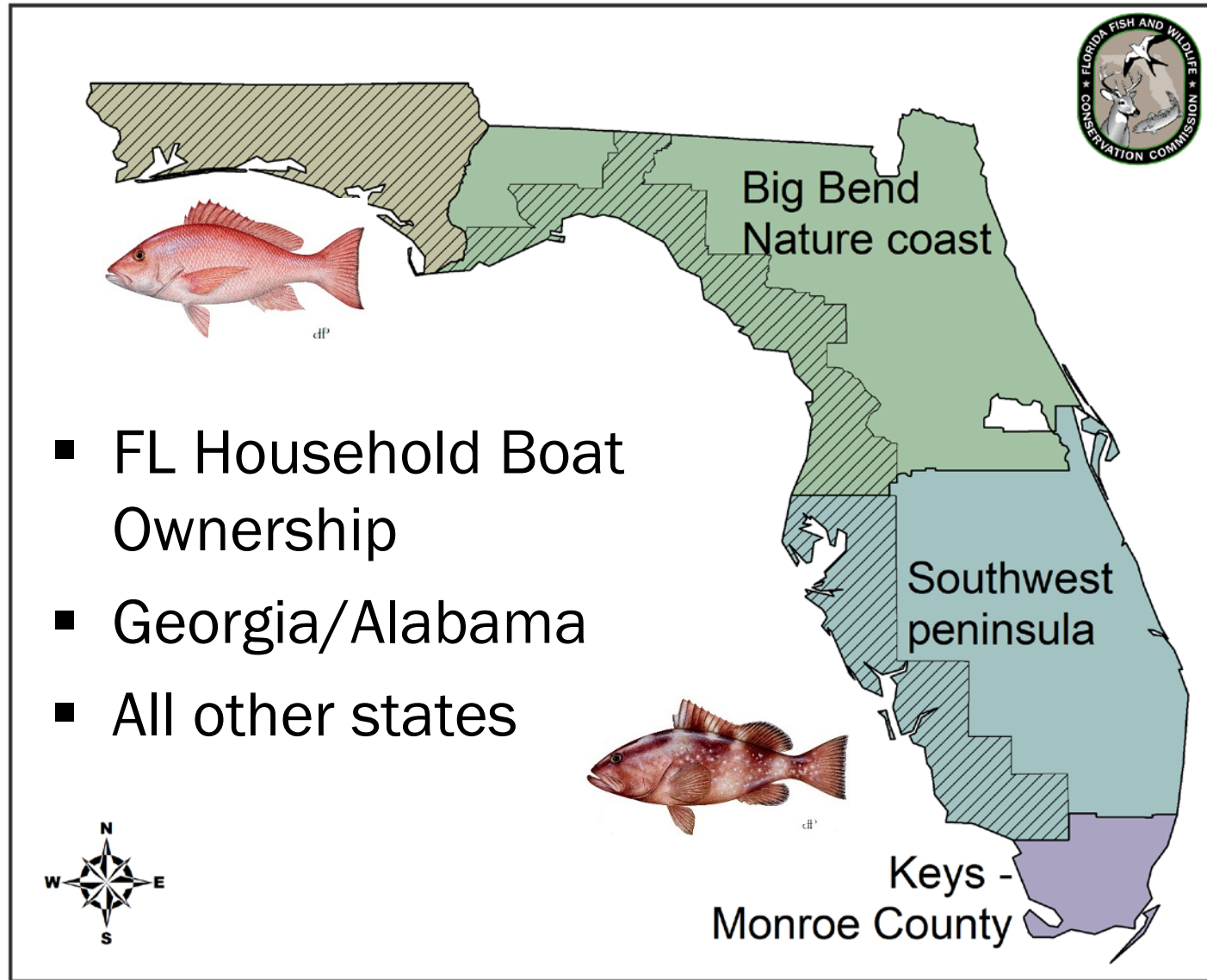
- Gulf Reef Fish Angler designation on Saltwater License
 - Implemented in 2015
- Required to harvest certain species from a private boat from the Gulf coast of Florida:



Provides a directory of private boat anglers that fish for reef fishes



Mail Survey Stratification



Mail Survey Methods

- >500,000 current subscribers
- Each month 10% or a maximum of 500 anglers in each stratum are randomly selected ($n = \sim 6,700$)
- Reminder postcard mailed
- Second survey packet mailed to non-respondents



Gulf Reef Fish Survey Questionnaire

This survey should be completed by FIRST NAME LASTNAME only.

Return this form even if you don't participate in recreational saltwater fishing.

▼START HERE

Please carefully follow these steps when completing this survey.

- Use only a blue or black ink pen that does not blot the paper
- Make solid marks inside the response boxes
- Do not make other marks on the survey

For the purpose of this questionnaire:

- A private boat is defined as any boat that did not have a paid professional captain and/or crew used for recreational fishing. *Do not* report any trips taken from a paid charter or large party boat.
- Please report only those trips where the boat launched from the west coast of Florida and recreational fishing occurred in saltwater regardless if fish were caught.

1 In general, when you go recreational fishing, how often does the boat (or boats) that you fish on launch from the following locations: (Check the box that corresponds to your answer)

| | NEVER | SOMETIMES | VERY OFTEN |
|--|--------------------------|--------------------------|--------------------------|
| 1 a residential boat slip, such as a dock at a waterfront home, vacation rental, condominium or apartment complex? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 a facility for launching boats from trailers (boat ramp)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 a wet slip at a commercially operated or municipal marina? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 a dry storage facility (boat is hoisted in/out of the water)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2 The following questions pertain to recreational fishing on artificial reefs off the Gulf coast of Florida:

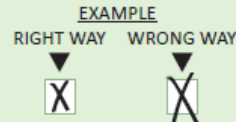
| | YES | NO | NOT SURE |
|---|--------------------------|--------------------------|--------------------------|
| 1 Do you ever fish recreationally on artificial reefs? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 During the month of APRIL, did you fish recreationally on an artificial reef? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3 During the month of APRIL, did you personally participate in a recreational fishing trip on a private boat that launched from the west coast of Florida? (Check the box that corresponds to your answer)

- 1 ☐ NO, I DID NOT FISH → THANK YOU - THAT IS ALL THE INFORMATION WE NEED. PLEASE RETURN THE QUESTIONNAIRE IN THE ENCLOSED ENVELOPE.
- 2 ☐ YES, I FISHED
- 3 ☐ NOT SURE, DO NOT RECALL

4 On the APRIL calendar below, please "X" the box that corresponds to each day when you personally participated in a recreational fishing trip on a private boat that launched from the west coast of Florida.

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| | | | | | | 1 <input type="checkbox"/> |
| 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> | 6 <input type="checkbox"/> | 7 <input type="checkbox"/> | 8 <input type="checkbox"/> |
| 9 <input type="checkbox"/> | 10 <input type="checkbox"/> | 11 <input type="checkbox"/> | 12 <input type="checkbox"/> | 13 <input type="checkbox"/> | 14 <input type="checkbox"/> | 15 <input type="checkbox"/> |
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| 23 <input type="checkbox"/> | 24 <input type="checkbox"/> | 25 <input type="checkbox"/> | 26 <input type="checkbox"/> | 27 <input type="checkbox"/> | 28 <input type="checkbox"/> | 29 <input type="checkbox"/> |
| 30 <input type="checkbox"/> | | | | | | |



5

For each trip marked on the API

- Each trip should be a recrea
- If you took more than 12 tri

TRIP 1
Please "X" ONE date the boat departed:

| S | M | T | W | T | F | S |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1 <input type="checkbox"/> |
| 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> | 6 <input type="checkbox"/> | 7 <input type="checkbox"/> | 8 <input type="checkbox"/> |
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| 30 <input type="checkbox"/> | | | | | | |

Refer to the enclosed map. Select the region the boat departed from:

- ☐ Northwest panhandle (excluding Alabama)
- ☐ Big Bend, Nature coast
- ☐ Southwest peninsula
- ☐ Keys, Monroe County

In which of the following areas did you fish? (select all that apply)

- ☐ 0-10 miles from the shoreline
- ☐ More than 10 miles from shore

If you selected more than one area above, what percentage of time did you spend fishing in each of the areas?

| | Less than 50% | About 50% | More than 50% |
|-------------------------------|--------------------------|--------------------------|--------------------------|
| 0-10 miles from shore | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| More than 10 miles from shore | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Did you fish on an artificial reef during this trip?

- Yes ☐ No ☐ Not Sure ☐

Did anyone on the boat keep, release, or try to catch any of the following species?

- ☐ Red snapper ☐ Banded rudderfish
- ☐ Vermilion snapper ☐ Almaco jack
- ☐ Other snappers ☐ Amberjack
- ☐ Gag, black, or red grouper ☐ Other jacks
- ☐ Other groupers ☐ None of these
- ☐ Gray triggerfish

For each trip, respondents report:

Trip date

Region fished

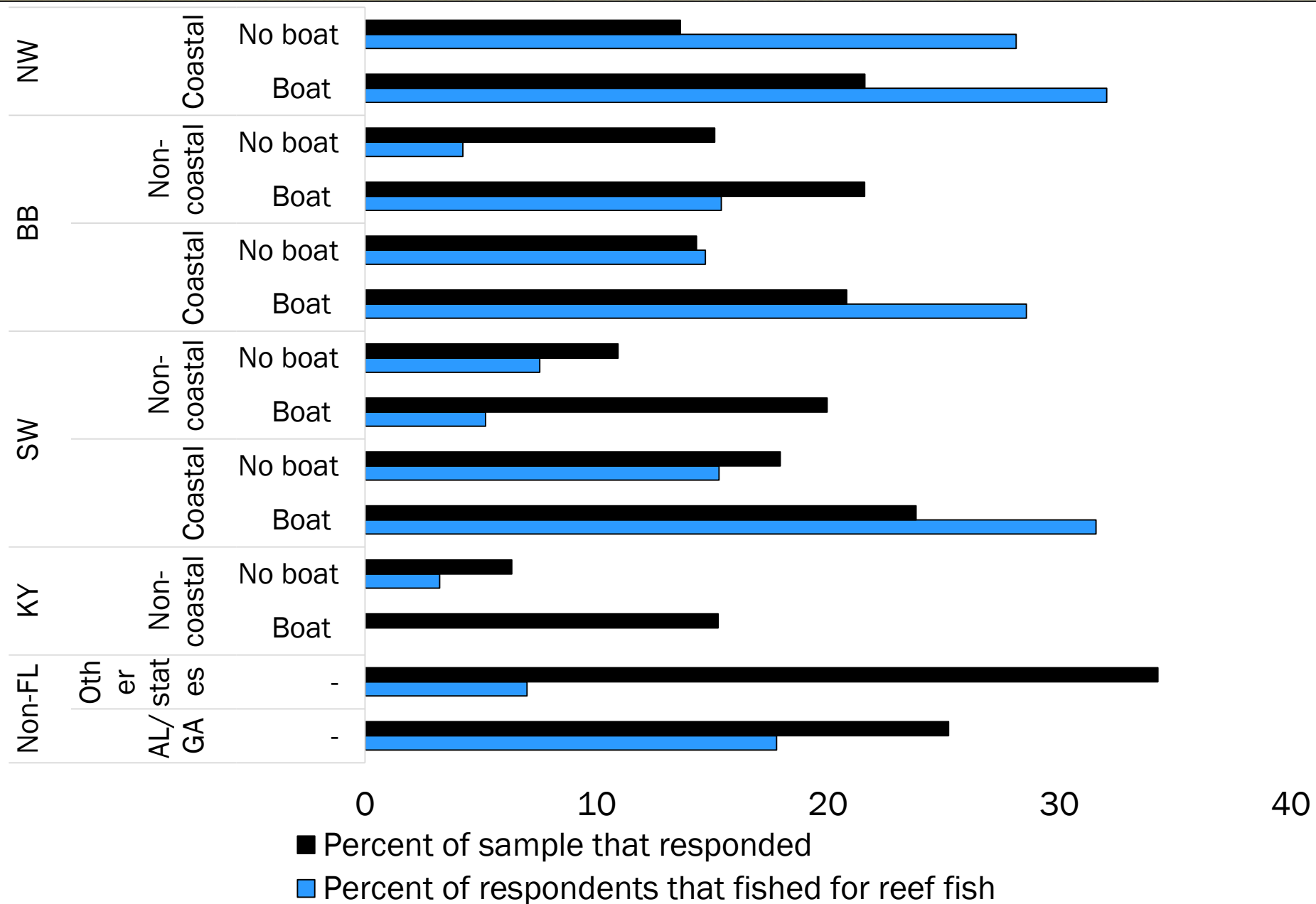
Area(s) fished

Time spent in each area

Fished an artificial reef

Species caught or targeted

Overall Response Rate $\sim 20\%$



Accounting for Response Bias

- Avidity Survey
 - >50% of GRFS subscribers not likely to participate in Gulf Reef Fish recreational trip
 - Modeled factors that predict likelihood of participation
 - Month*
 - boat ownership*
 - coastal household*
 - Internet license purchase
- * accounted for in mail survey stratification



Benefits of GRFS Mail Survey

- Directly estimates trips targeting reef fishes
- More timely monthly estimates
- Improved precision
 - No need to partition effort among state and EEZ
 - MRIP transitioning to mail survey (FES) to improve response rates
- Improved accuracy
 - FES and GRFS produce higher effort estimates
- Improved spatial resolution
 - Direct estimates of regional effort (no post-stratification)



Intercept Surveys

- APAIS

- Reef fish interviews collected from offshore site group and all other MRIP sites

- GRFS

- Supplemental assignments at offshore sites

- Complementary sample weights allow data from APAIS and GRFS to be combined

- Streamlined interview

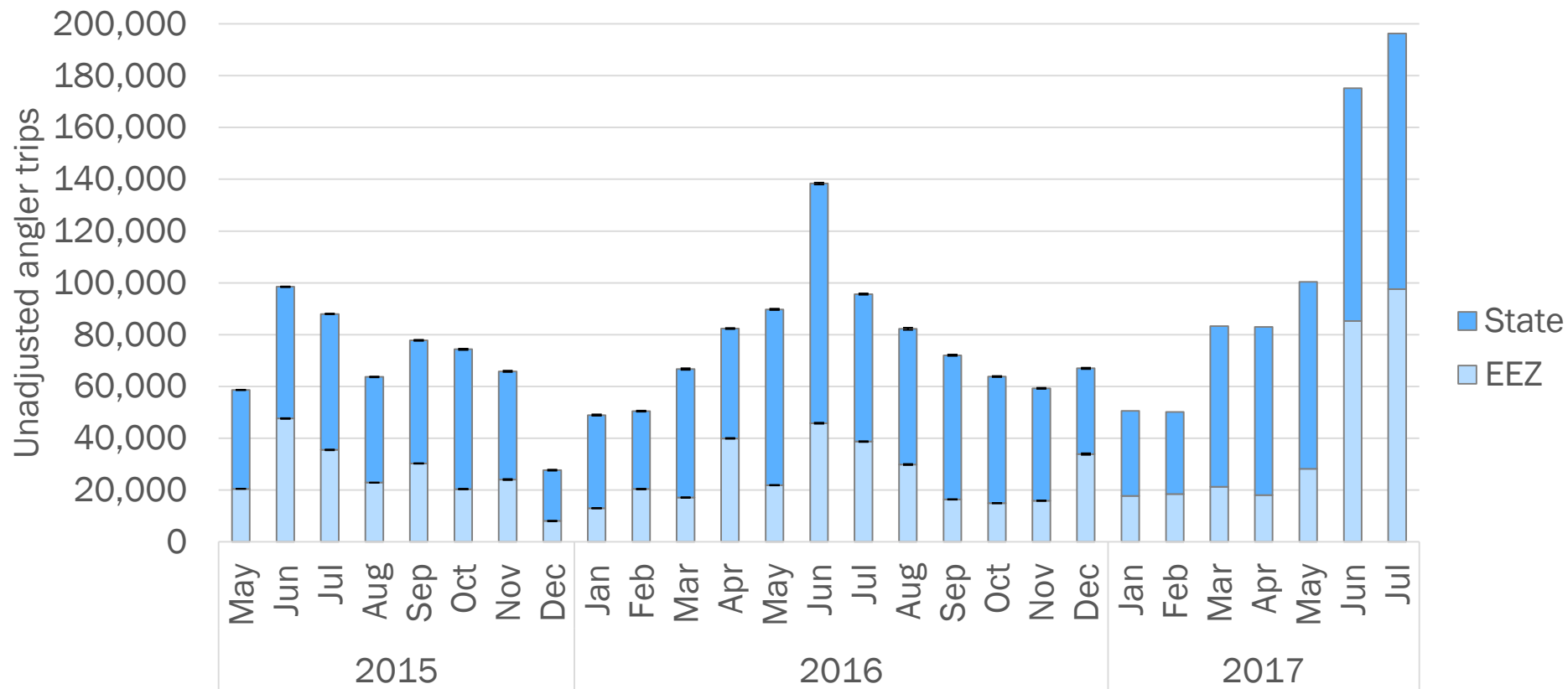
- Ensures more reef fish anglers are interviewed
 - More detailed trip data from reef trips
 - Improved biological sampling of harvested reef fish

- Under-coverage adjustment



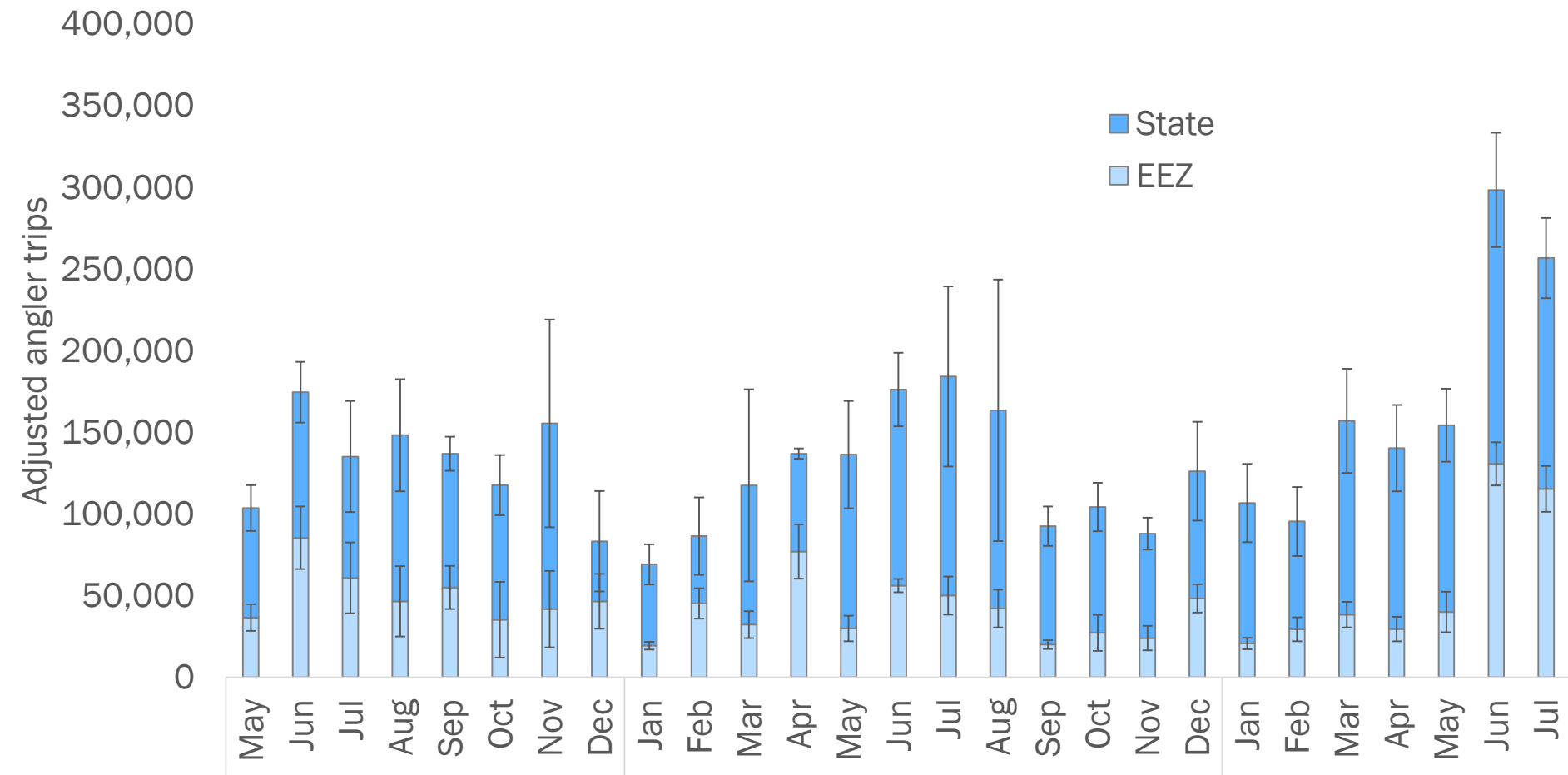
Estimation

The GRFS mail survey provides precise monthly estimates of reef fish trips by registered anglers in state and federal waters



Estimation

- Effort adjusted for anglers not subscribed to GRFS mail survey



Estimation

- Catch estimates

- Estimation methods will be finalized by end of this year
- Preliminary red snapper landings are comparable to MRIP, point estimates are slightly higher
- Due primarily to higher effort estimate from GRFS mail survey
- Still evaluating other species, differences seem to be driven by effort



MRIP Certification

- Peer review initiated this year, 3 conference calls
- Statistical Consultants:
 - Ginny Lesser – Oregon State University
 - Lynn Stokes – Southern Methodist University
 - Jean Opsomer – Colorado State University
 - Jay Breidt – Colorado State University
 - Mike Brick – Westat
- Review meeting, St. Petersburg, FL
 - Delayed by Hurricane Irma
 - Rescheduled for February 2018
- Following Review
 - FWC responds to consultants recommendations
 - Goal: submit survey design to MRIP for Certification during 2018



Future

- One survey method for Florida?
 - Licensed anglers in Florida may fish from both the Gulf and Atlantic coasts
 - Multiple survey and reporting requirements for state anglers is not desirable
 - Once the GRFS methodology is certified, the state may consider implementing statewide to estimate catch and effort on the Atlantic coast and the Keys



Acknowledgments

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 - Jean Opsomer – Colorado State University
 - Jay Breidt – Colorado State University
 - Mike Brick – Westat
- NOAA Office of Science and Technology
- Gulf States Marine Fisheries Commission
- FWC Division of Marine Fisheries Management
- FWC Licensing and Permitting Office
- Florida Division of Highway Safety and Motor Vehicles
- National Fish and Wildlife Foundation

