

# SEDAR 79: Mutton Snapper SRFS-calibrated private mode

**Review Workshop, Sept 10, 2024**  
**Chloe Ramsay**

Florida Fish and Wildlife Conservation Commission  
Fish and Wildlife Research Institute  
[Chloe.Ramsay@myfwc.com](mailto:Chloe.Ramsay@myfwc.com)



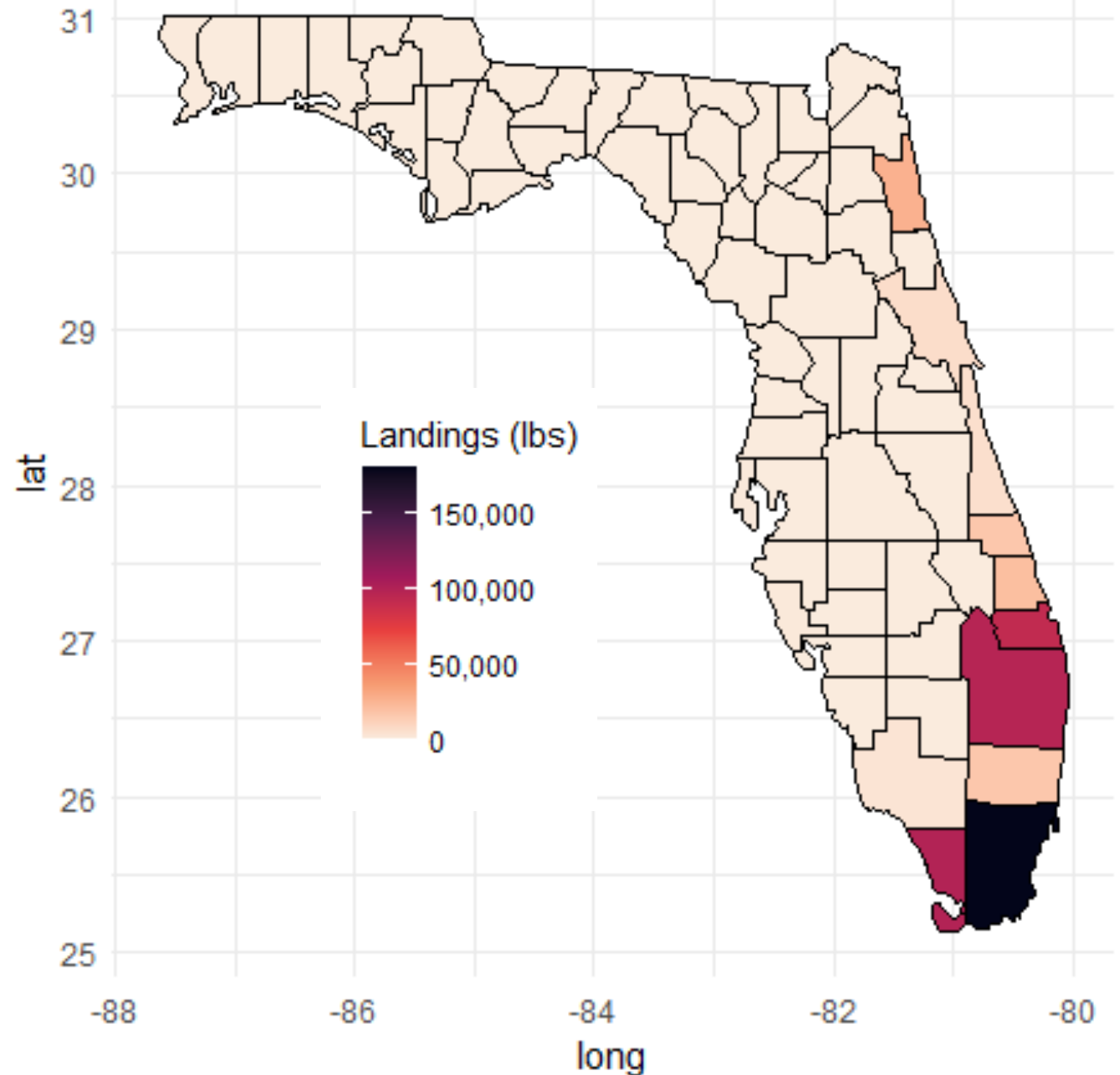
# Recreational Catch & Effort Surveys in Florida

- MRIP 1981-current
  - Shore, private boat, charter
- SRFS 2015-current
  - Only private boat
  - Added Mutton Snapper in mid-2020 statewide expansion



# Regions for Mutton

- Years available for SRFS:  
2021-2023
- Regions:
  - Atlantic (atl) = Atlantic coast counties
  - Gulf + Keys (gulfk) = Gulf coast counties and Monroe County

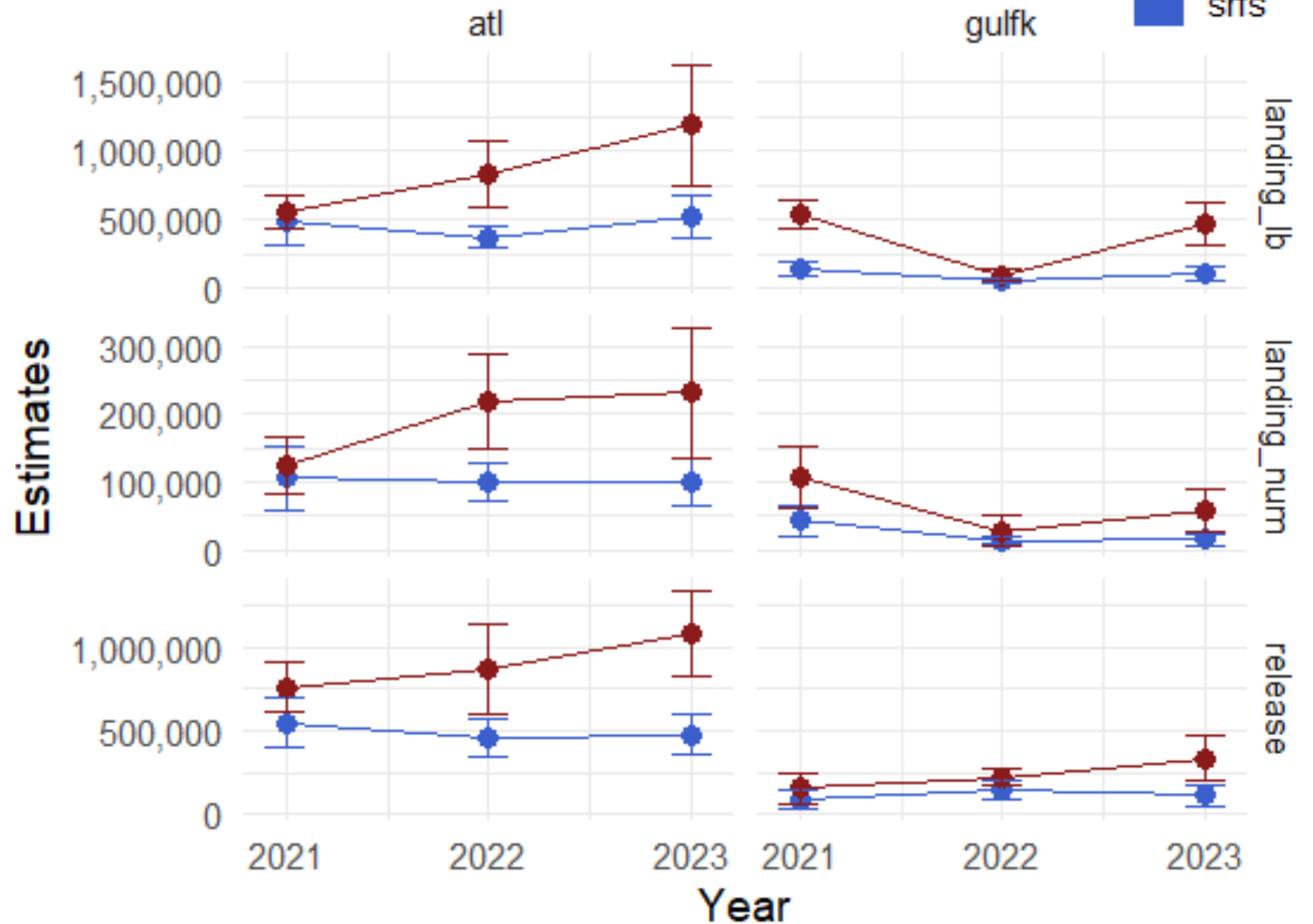


# Estimates Comparison

Survey



- Estimates of:
  - Landings (pounds)
  - Landings (# of fish)
  - Releases (# of fish)



# Calibration

- Objective: Produce a historic time series for private boat mode in FL in the same currency as the SRFS.
  - Generate a conversion factor and apply it to historic MRIP estimates
- Calibration approach passed peer review in the Gulf for the original GRFS species, and now again for the expansion into the Atlantic



# Step 1: Sum estimates and variance

- Estimates and variances from each estimation method ( $m = \text{SRFS or MRIP-FES}$ ) were calculated for each:
  - variable ( $v = \text{number landed, pounds landed, or number released}$ )
  - region ( $r = \text{Atlantic Ocean [atl] or Gulf of Mexico w/ Monroe County [gulfk]}$ )
- Summed across all years ( $y: 2021-2023$ ), all two-months waves ( $w$ ), and areas fished ( $a$ ; EEZ, state waters)

$$\hat{E}_{m,v,r} = \sum_{m,v,r} \hat{E}_{y,w,a,m,v,r}$$

$$\hat{V}(\hat{E}_{m,v,r}) = \sum_{m,v,r} \hat{V}(\hat{E}_{y,w,a,m,v,r})$$



Resulted in 6 pairs of SRFS and MRIP sums: 2 for each region & 3 for each variable

# Summed Values

Estimate Type	Region	SRFS sum	SRFS variance	MRIP sum	MRIP variance
Landings (lbs)	atl	1,386,026	15,870,313,093	2,575,371	67,311,812,109
	gulfk	310,353	1,550,917,747	1,103,133	9,778,057,302
Landings (no. fish)	atl	304,339	1,098,863,226	574,618	4,143,691,709
	gulfk	70,234	189,452,787	193,247	936,709,273
Releases (no. fish)	atl	1,484,579	12,804,844,036	2,714,331	41,480,750,381
	gulfk	340,991	2,739,220,156	708,663	7,460,804,102



## Step 2: Calculate ratios and variance

- For each of the 6 paired sums, the ratio was calculated as the total SRFS estimate divided by total MRIP-FES estimate

$$\hat{R}_{s,v} = \frac{\hat{E}_{SRFS,v,r}}{\hat{E}_{MRIP,v,r}}$$

- Delta method used to approximate the variance of the ratios
  - Incorporates error associated with both the SRFS and MRIP-FES estimates





# Calibration Ratios

Estimate Type	Region	SRFS sum	SRFS variance	MRIP sum	MRIP variance	Ratio
Landings (lbs)	atl	1,386,026	15,870,313,093	2,575,371	67,311,812,109	0.54
	gulfk	310,353	1,550,917,747	1,103,133	9,778,057,302	0.28
Landings (no. fish)	atl	304,339	1,098,863,226	574,618	4,143,691,709	0.53
	gulfk	70,234	189,452,787	193,247	936,709,273	0.36
Releases (no. fish)	atl	1,484,579	12,804,844,036	2,714,331	41,480,750,381	0.55
	gulfk	340,991	2,739,220,156	708,663	7,460,804,102	0.48



## Step 3: Convert to SRFS currency

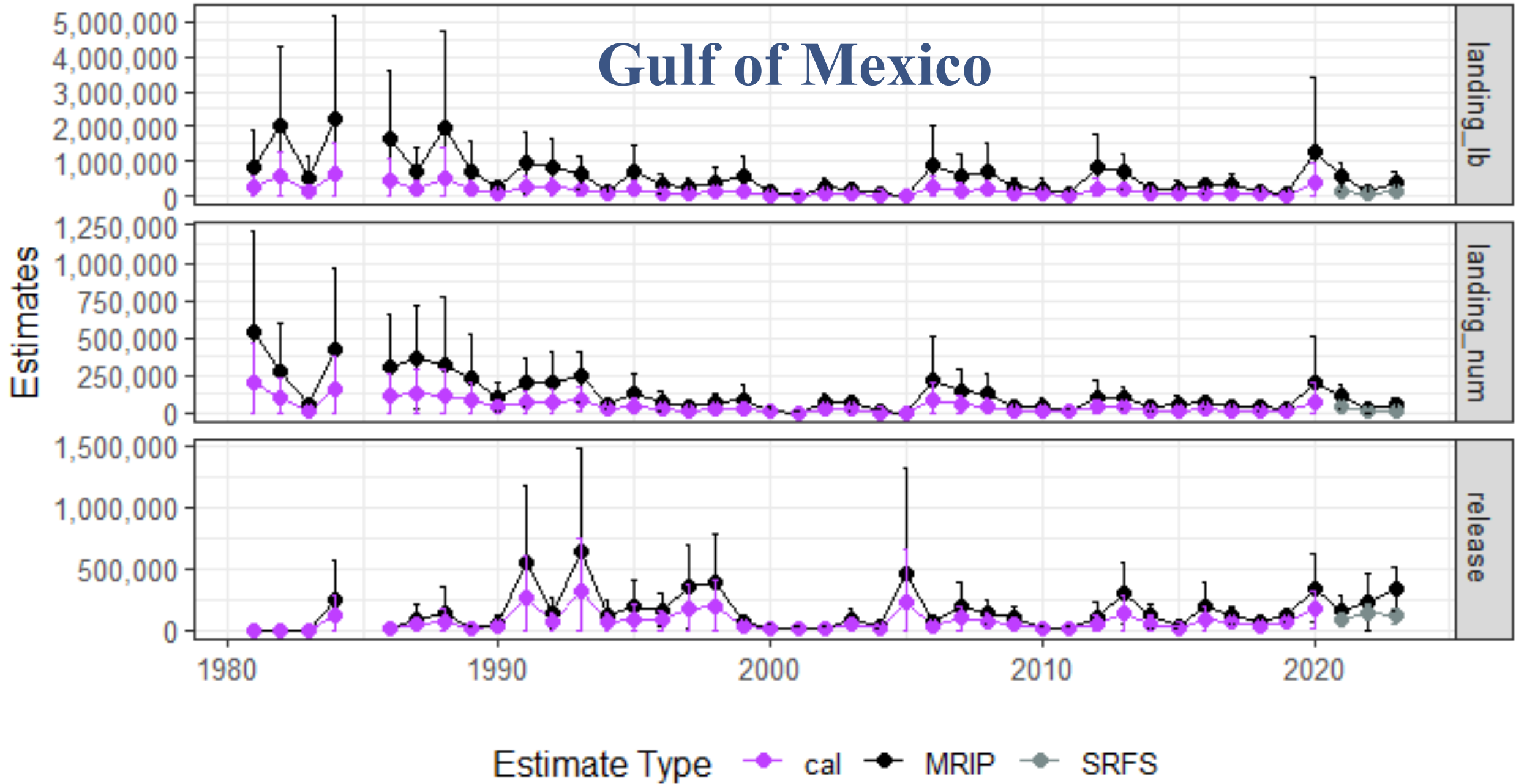
- Multiply the annual MRIP-FES estimate for each year, variable (number landed, pounds landed, number released), and region (Atl & Gulfk) with the corresponding ratio

$$\hat{E}_{SRFS-hind,y,v,r} = \hat{R}_{v,r} \hat{E}_{FCAL,y,v,r}$$

- Variance was again approximated using the delta method

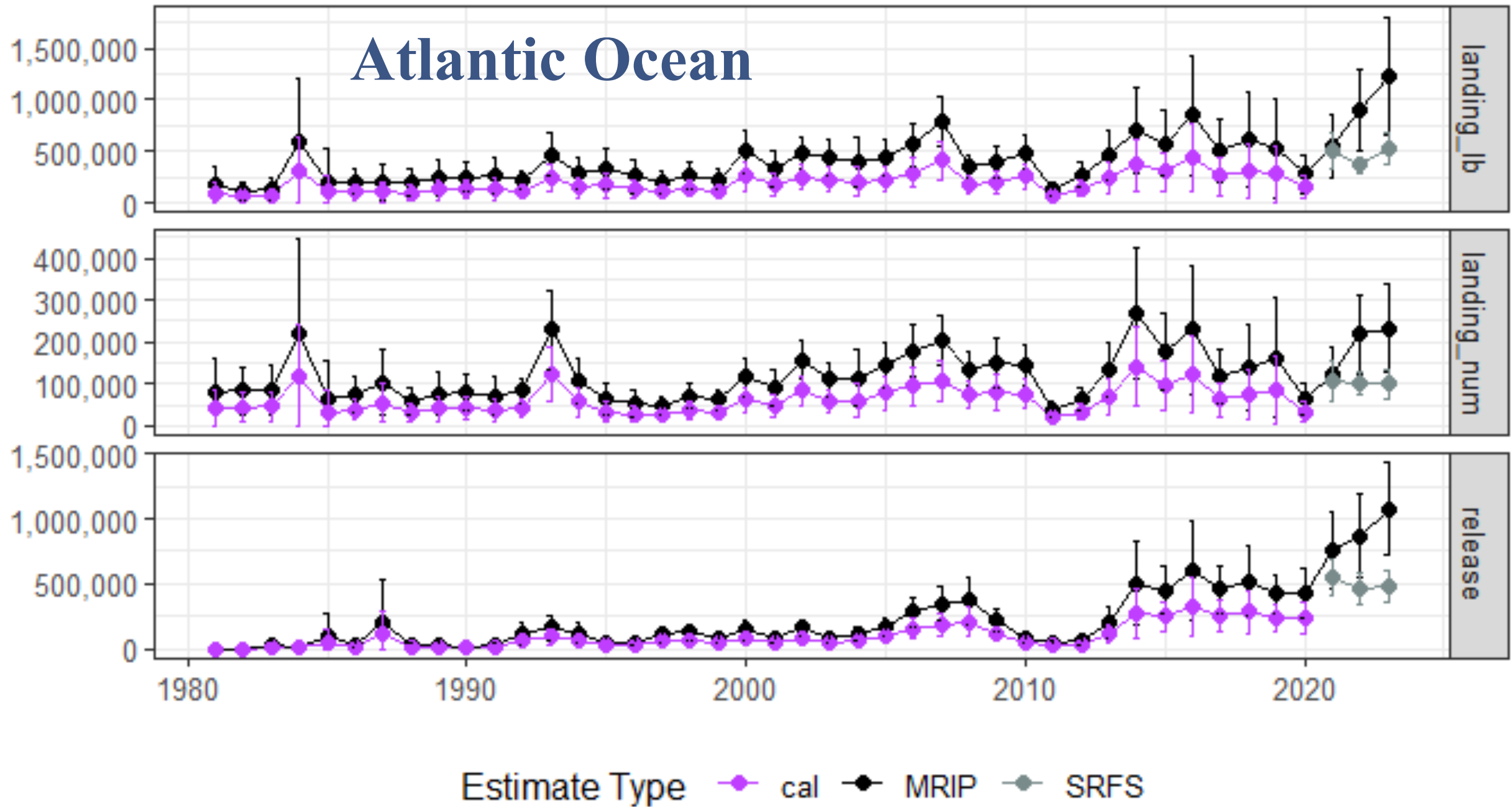


# Gulf of Mexico



# Atlantic Ocean

Estimates



# Future Use

- Any other species included in the SRFS survey
- Can update ratios as the years progress



## Mutton Snapper

*Lutjanus analis*

Bright  
blue line  
below eye

small black spot



Offshore adults can be reddish in  
color (not as red as true Red Snapper)

# Thanks!



# Bonus Materials





# SRFS Development

- Three Gulf regional workshops 2013-2014
  - State surveys developed for more timely and precise data
    - Particularly to support Red Snapper management, and more in FL
- Florida's Gulf Reef Fish Survey
  - Implemented in May 2015
  - Peer review and NOAA certification in 2018
- Expanded statewide in July, 2020
  - Renamed State Reef Fish Survey
  - Runs concurrent with MRIP





# Survey Design

- Complementary survey methods
  - Mail survey of fishing effort
    - Separate from MRIP-FES
  - Angler intercept survey for CPUE
    - MRIP-APAIS and SRFS combined
- Used together to produce year-round, monthly estimates
  - Effort, landings, and discards
- Peer-review findings
  - Approach is sound
  - Studied extensively by two National Academy panels



*The FWC's*

# State Reef Fish Survey

There are two components to the State Reef Fish Survey:



## MAIL

If selected, we will ask:

- How often you fish
- Where you fish
- Types of fish you target



## DOCKSIDE

If interviewed, we will ask:

- Types of fish you caught
- How many reef fish you released and harvested
- If we can sample your fish

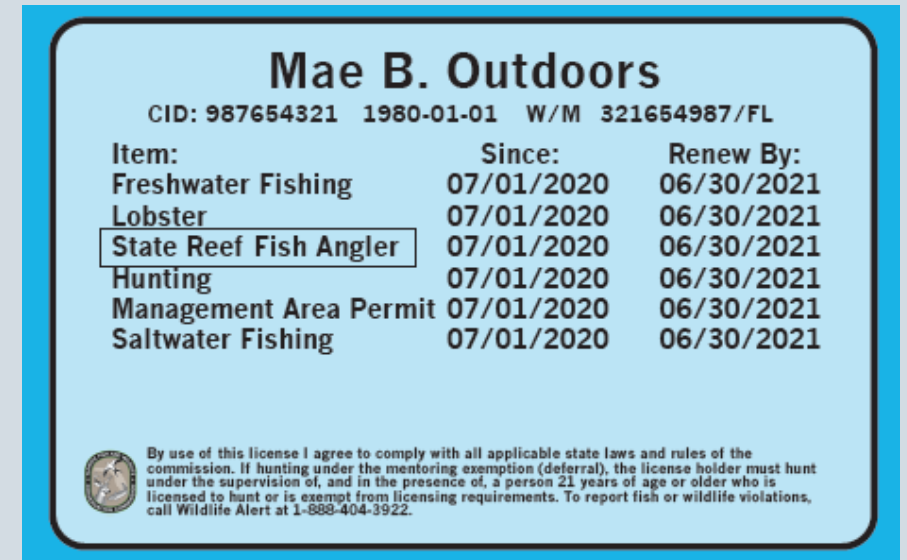


**Together, these surveys tell us:**

How many recreational reef fish trips are taken each month, and the total number of fish that are harvested and released.

# State Reef Fish Angler Designation

- Florida saltwater fishing license
  - No way to distinguish offshore anglers
- State Reef Fish Angler designation
  - Required when fishing for reef fishes from a private boat
  - Sample universe for specialized survey
- Defining universe of offshore anglers for use in surveys endorsed by MAFAC\*
  - Under consideration by regional Councils in Gulf and S. Atlantic



***Provides a directory of participants in the reef fish recreational fishery***



\*Better Defining the Universe of Offshore Recreational Anglers

<https://www.fisheries.noaa.gov/national/partners/marine-fisheries-advisory-committee-reports-and-recommendations>

# Species that **DO** Require State Reef Fish Angler Designation

## Do you fish for any of these species?

As a reef fish angler or spear fisher, you may be asked periodically to participate in voluntary mail and dockside surveys. These surveys provide important information needed to monitor the fishery and provide optimum recreational fishing opportunities in Florida.

Beginning July 1, 2020, anglers 16 years of age and older are required to sign up as a State Reef Fish Angler if they fish from a private recreational boat for any of the 13 species described in this brochure. Signing up helps FWC reach out directly to people who fish for reef fish species and collect better data.

With your help, we can improve scientific data and management of these important recreational fisheries. To learn more about how to sign up as a State Reef Fish Angler, visit [MyFWC.com/SRFS](http://MyFWC.com/SRFS).

**Black Grouper**  
*Mycteroperca bonaci*

Box-like patches on body



Copper spots on face and body

**Red Snapper**  
*Lutjanus campechanus*

Does NOT have a yellow eye



Sharply pointed anal fin

**Yellowtail Snapper**  
*Ocyurus chrysurus*

Prominent yellow stripe runs from eye to tail



Deeply forked tail

**Almaco Jack**  
*Seriola rivoliana*

Front dorsal and anal fins elongated



A deep and flat-bodied amberjack

**Red Grouper**  
*Epinephelus morio*

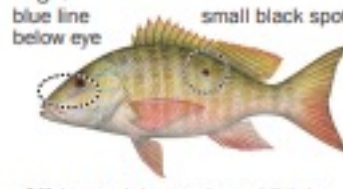
Webbing is even with the tip of the spine, creating a straight line



Irregular light blotches on body

**Mutton Snapper**  
*Lutjanus analis*

Bright blue line below eye



Offshore adults can be reddish in color (not as red as true Red Snapper)

**Gray Triggerfish**  
*Balistes capricus*

Upper rim of eye blue



Caudal fin lobes elongated in adults

**Amberjacks (Greater, Lesser)**

Lesser Amberjack not pictured here. Lesser Amberjacks grow up to 12 inches in length.

Dark band extends from nose to dorsal fin



Soft dorsal base and anal fin are closer in length than in banded rudderfish

**Gag Grouper**  
*Mycteroperca microlepis*

Webbing between spines is notched



Brownish gray in color with dark, worm-like markings

**Vermilion Snapper**  
*Rhomboplites aurorubens*

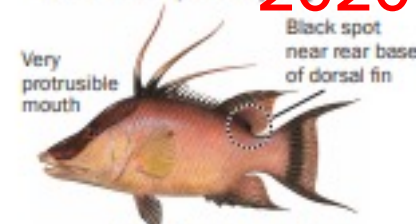
Bullet shaped body



Forked caudal fin

**Hogfish**  
*Lachnolaimus maximus*

First 3 dorsal spines very long



Color varies by sex and age

**Banded Rudderfish**  
*Seriola zonata*

Tail-lobe often white tipped



**July 2020**

**July 2020**

**July 2020**



# Integrated Approach

- Catch estimates from SRFS include data from:
  - MRIP Access Point Angler Intercept Survey (APAIS)
  - Supplemental assignments at offshore access sites
    - Screen through parties fishing for non-reef fish species
- Intercept data also used to measure under-coverage for effort survey

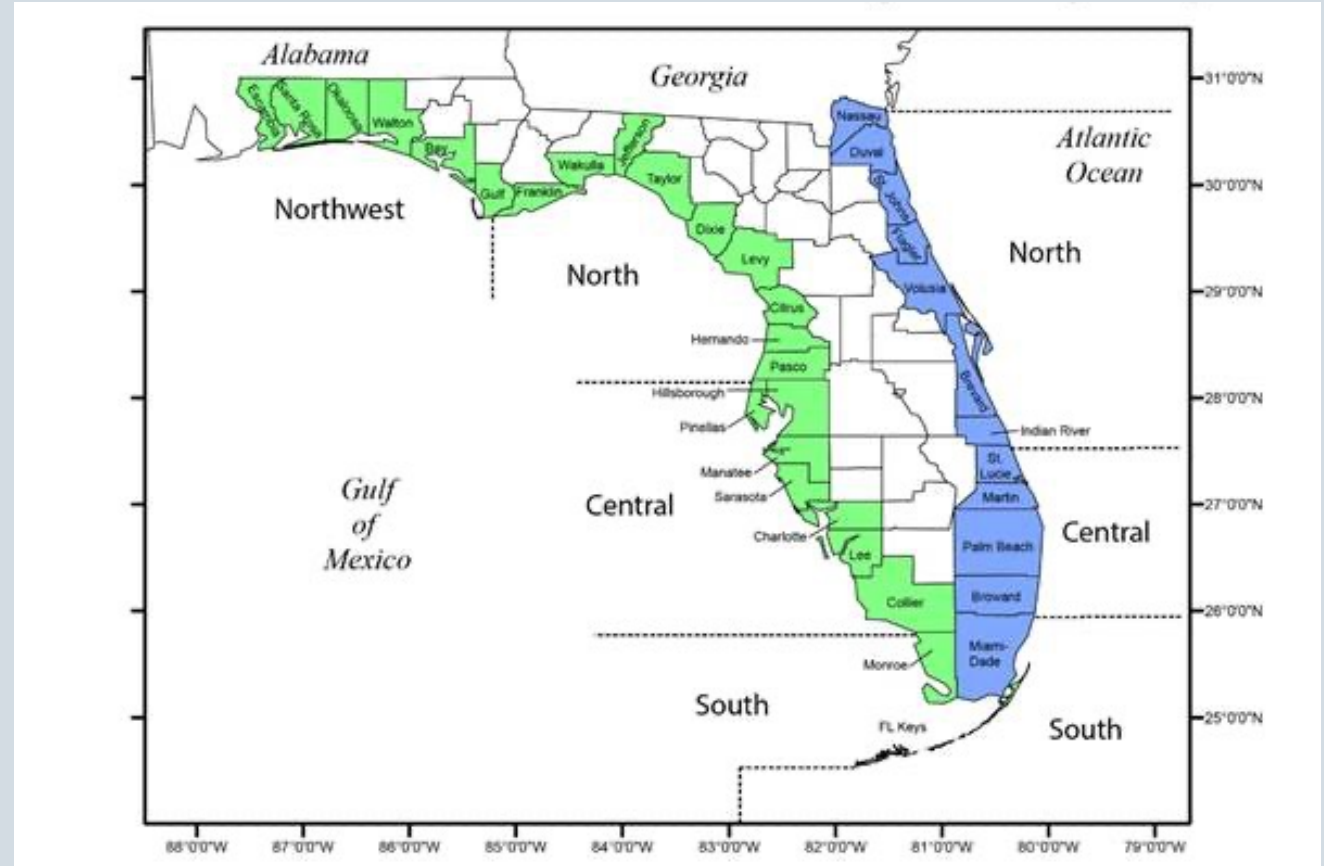


*Increased intercepts  
from reef fish trips*



# Effort Survey

- Mail survey stratification
  - Non-residents
    - Georgia/Alabama
    - All other states
  - Florida residents
    - Northwest, North, Central, South Florida
    - Gulf, Atlantic, inland counties
    - Whether address matches a state boat registration



*Accounts for varied response rates and avidities among different types of anglers*



# Effort Questionnaire

## *Reduced recall period and potential recall error*

Respondents asked to recall whether they fished from a private boat in FL over past month.

Use calendar for most recent month to mark each day they recall taking a trip.



**Florida Saltwater Recreational Fishing Survey**

**SRFS**  
STATE REEF FISH SURVEY

This survey should be completed by **FIRST NAME LASTNAME** only.  
Return this form even if you did not participate in saltwater recreational fishing.

For the purpose of this questionnaire:

- A **private boat** is defined as any boat that did not have a state or federal license to conduct professional for-hire recreational fishing trips. Do not report any trips taken from a licensed charter or large party boat.
- Please report only those trips where the boat launched from Florida and recreational fishing occurred in saltwater, even if no fish were caught.
- Use only a black ink pen to "X" the response boxes. Please **do not** use blue ink.
- Please report trips **only** for the month specified.

**Q1. During the month of NOVEMBER, did you personally participate in a recreational fishing trip on a private boat that launched from Florida? (Check the box that corresponds to your answer)**

NO, I DID NOT FISH → THANK YOU - That is all the information we need. Please return the questionnaire in the enclosed postage-paid envelope.

YES, I FISHED (Continue to Q2.)

NOT SURE, DO NOT RECALL

**Q2. On the NOVEMBER calendar below, please "X" the box for each date that you personally participated in a recreational fishing trip on a private boat that launched from Florida.**

NOVEMBER						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
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"/>	16 <input type="checkbox"/>	17 <input type="checkbox"/>	18 <input type="checkbox"/>	19 <input type="checkbox"/>	20 <input type="checkbox"/>	21 <input type="checkbox"/>
22 <input type="checkbox"/>	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"/>					

**Q3. When you went recreational fishing in NOVEMBER, which of the following locations did the boat (or boats) that you fished on launch from:**

SELECT ALL THAT APPLY:

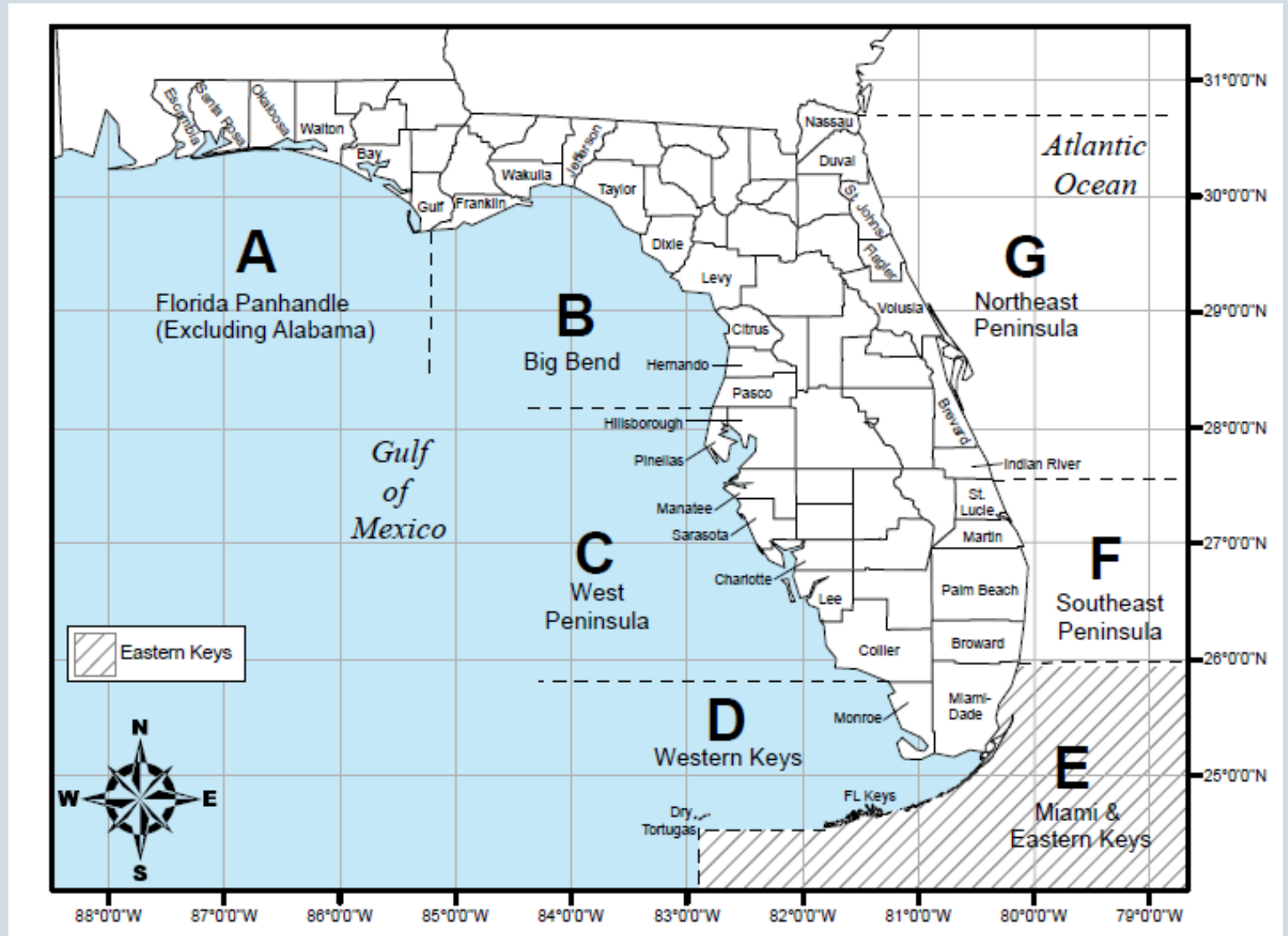
1 a residential boat slip (waterfront home, vacation rental, condominium or apartment complex)?

2 other facilities for launching boats (public boat ramp, municipal marina, dry storage)?

Please turn the page and tell us about your trips.



*Fishing area map  
provided with  
questionnaire*



# Trip Level Reporting

Trip date

Region fished in  
Gulf or Atlantic

% time, if any,  
fished in EEZ

Species caught  
or targeted

<p><b>TRIP 1</b></p> <p>Please write in the day the boat departed:</p> <p><input type="text" value="0"/> <input type="text" value="5"/> / <input type="text" value="D"/> <input type="text" value="D"/> / <input type="text" value="2"/> <input type="text" value="0"/> <input type="text" value="2"/> <input type="text" value="1"/></p> <p>Did you fish on an artificial reef during this trip?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/> Not Sure <input type="checkbox"/></p>	<p>Select ONE region the boat spent the majority of time fishing: See enclosed map</p> <p>Gulf of Mex. <input type="checkbox"/> A Florida panhandle  <input type="checkbox"/> B Big Bend  <input type="checkbox"/> C West Peninsula  <input type="checkbox"/> D Western Keys</p> <p>Atlantic O. <input type="checkbox"/> E Miami &amp; Eastern Keys  <input type="checkbox"/> F Southeast Peninsula  <input type="checkbox"/> G Northeast Peninsula</p>	<p>What percent of your time, if any, was spent fishing offshore in federal waters (select one):</p> <p>Gulf of Mex. more than 10 miles from shore?  <input type="checkbox"/> 0% <input type="checkbox"/> 10% <input type="checkbox"/> 20% <input type="checkbox"/> 30% <input type="checkbox"/> 40% <input type="checkbox"/> 50%  <input type="checkbox"/> 60% <input type="checkbox"/> 70% <input type="checkbox"/> 80% <input type="checkbox"/> 90% <input type="checkbox"/> 100%</p> <p>Atlantic O. more than 3 miles from shore?  <input type="checkbox"/> 0% <input type="checkbox"/> 10% <input type="checkbox"/> 20% <input type="checkbox"/> 30% <input type="checkbox"/> 40% <input type="checkbox"/> 50%  <input type="checkbox"/> 60% <input type="checkbox"/> 70% <input type="checkbox"/> 80% <input type="checkbox"/> 90% <input type="checkbox"/> 100%</p>	<p>Did anyone on the boat keep, release, or try to catch any of the following species? See Species Guide</p> <p><u>Snappers &amp; Groupers:</u>  <input type="checkbox"/> Red snapper  <input type="checkbox"/> Vermilion snapper  <input type="checkbox"/> Mutton snapper  <input type="checkbox"/> Yellowtail snapper  <input type="checkbox"/> Gag, black or red grouper  <input type="checkbox"/> Other snappers, groupers</p> <p><u>Other reef fish:</u>  <input type="checkbox"/> Gray triggerfish  <input type="checkbox"/> Hogfish  <input type="checkbox"/> Amberjack  <input type="checkbox"/> Almaco jack  <input type="checkbox"/> Banded rudderfish  <input type="checkbox"/> Other jacks</p> <p><u>Inshore species:</u>  <input type="checkbox"/> Snook  <input type="checkbox"/> Red drum  <input type="checkbox"/> Seatrout  <input type="checkbox"/> Bay Scallops</p> <p><u>Other species:</u>  <input type="checkbox"/> Some other species</p>
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Artificial reef use

***Allows for direct estimation of reef fish effort by region and area fished***





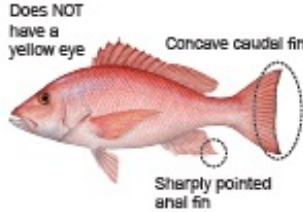
# Reef fish ID guide included with questionnaire

During each trip, did you either catch or try to catch any of the following species?

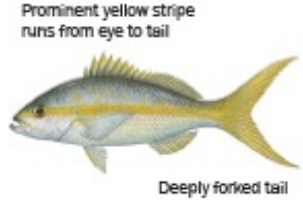
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**Red Snapper**  
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**Almaco Jack**  
*Seriola rivoliana*



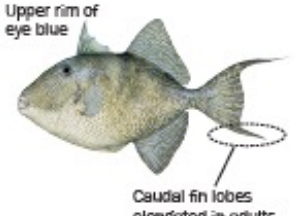
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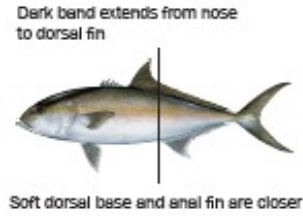
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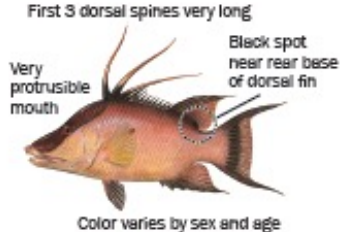
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*Mycteroperca microlepis*



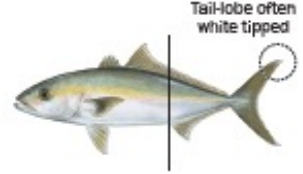
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*Rhomboplites aurorubens*



**Hogfish**  
*Lachnolaimus maximus*



**Banded Rudderfish**  
*Seriola zonata*



# Data Inputs for Estimation

