Electronic Monitoring Documentation of Gray Snapper (Lutjanus griseus) Catches in the Eastern Gulf of Mexico Commercial Reef Fish Bottom Longline Fishery

Max Lee, Carole Neidig, and Katie Harrington

SEDAR75-WP-04

16 June 2022

Please cite this document as:

Lee, Max, Carole Neidig, and Katie Harrington. 2022. Electronic Monitoring Documentation of Gray Snapper (Lutjanus griseus) Catches in the Eastern Gulf of Mexico Commercial Reef Fish Bottom Longline Fishery. SEDAR75-WP-04. SEDAR, North Charleston, SC. 6 pp.

Electronic Monitoring Documentation of Gray Snapper (*Lutjanus griseus*) Catches in the Eastern Gulf of Mexico Commercial Reef Fish Bottom Longline Fishery

Max Lee, B.S., Carole Neidig, M.S., and Katie Harrington, B.A.

Mote Marine Laboratory
Center for Fisheries Electronic Monitoring (CFEMM)
1600 Ken Thompson Parkway
Sarasota, FL 34236
maxlee@mote.org
www.mote.org/CFEMM

Grant Support
National Fish and Wildlife Foundation, Electronic Monitoring and Recording Program
NOAA NMFS Cooperative Research Program
NOAA NMFS Bycatch Reduction Engineering Program
Net Gains Alliance

Industry Partners
Gulf of Mexico Reef Fish Shareholders' Alliance
Independent Gulf Commercial Reef Fish Industry Participants

SEDAR 75 - Gulf of Mexico Gray Snapper

Submitted
16 June 2022

MML Tech. Rpt. No. 2559

Overview of Electronic Monitoring Efforts

The Center for Fisheries Electronic Monitoring at Mote (CFEMM) has been pioneering electronic monitoring (EM) in the Gulf of Mexico (GoM) commercial reef fish fishery since 2016, utilizing Saltwater Inc. (SI) (Anchorage, AK) hardware and vessel and review software. Industry volunteer participation has included collaborations with 22 commercial bottom longline (BLL) and vertical line vessels. Data reported below, including for gray snapper (*Lutjanus griseus*), was generated by 14 Eastern Gulf of Mexico (EGoM) BLL vessels fishing out of ports along Florida's west coast from Cortez, FL to Redington Shores, FL from July 2016 to March 2022.

- Gray Snapper Recorded = 365
- Total Catch Events Recorded = 89,577
- Trips = 335
- Hauls Reviewed = 1,892 (Represents 25% of all potentially analyzable set-haul events)
- Sea Days = 3,037
- Unique species/species groupings annotated = 132

Video Review Protocol

Saltwater Inc. Electronic Monitoring Unit hard drives from participating vessels were collected during dockside visits or mailed by the respective captains or vessel owners. These hard drives were loaded to CFEMM workstations, where SI non-proprietary review software was used to annotate the collected video footage. Sets and hauls were marked along a timeline by reading associated sensor data (hydraulic pressure and rotation). A random subsample of 25% of the complete set/haul events from each trip were reviewed. Each recorded catch event was assigned characteristics based on a series of dropdown menus from which the reviewer would select the most accurate variable. These included:

- **Species**
- **Handling**
    - Brought onboard,
    - Not handled (dropped off),
    - Cutoff at rail (no entanglement),
    - Cutoff at rail (entanglement), or
    - Unknown handling.
- **Condition**
    - Live healthy,
    - Live stomach and/or eyes protruding,
    - Live damaged,
    - Dead on arrival damaged,
    - Dead on arrival undamaged, or
    - Unknown condition.
- **Fate**
    - Retained,
    - Retained as bait,
    - Discarded live healthy (vented),
    - Discarded live healthy (not vented),

    - Discarded live damaged (not vented),
    - Discarded live damaged (vented),
    - Discarded dead,
    - Discarded unknown, or
    - Unknown fate.
- **Shark Specific Attributes**
    - Sex - Male/Female
    - Maturity - Juvenile/Known Adult
    - Size Estimate - Small (>1m), Medium (1.1 to 2.9m), or Large (>3m)

Post-Review Processing

The resulting data navigated a CFEMM established QA/QC process where all annotated events and sensor data anomalies were reviewed by experienced staff to screen for identification errors or missing catch. Aggregated groupings of trips were further screened using "R", applying a series of over 50 error checks to flag any abnormalities. Once approved, final data was appended to the master CFEMM database in Access™. For reporting purposes, additional automatic calculations and environmental metadata were linked to the Access™ database through an export routine in "R", allowing for more than 200 key variables to be associated to catch events, such as depth, average temperature, and bottom type.

Overview of Gray Snapper Occurrence in the EGoM BLL Fishery

The EGoM BLL fishery primarily targets red grouper (*Epinephelus morio*), red snapper (*Lutjanus campechanus*), and yellowedge grouper (*Epinephelus flavolimbatus*) across the West Florida Shelf (WFS) from offshore Apalachicola, FL to the Dry Tortugas. The CFEMM documented 365 captures of gray snapper (a bycatch species) on EGoM BLL gear targeting reef fish from 1,892 reviewed hauls. Gray snapper in the region were the 21st most frequently caught species on this gear type and were recorded on 13.37% of all BLL hauls.

Catch and Effort Distribution

Gray snapper catches were recorded on BLL gear from 29° north latitude to 24.5° north latitude, and as far offshore as -85° west longitude, with the majority being recorded between north of 26° latitude (Figure 1). These individuals were encountered in depths from 36.7m to 82.1m, with an average capture depth of 49.7m. Catch per unit effort (CPUE) was calculated (*See Note*) based on hook-hours, using the regulated EGoM limit of 750 hooks. Gray snapper CPUE indices for set-haul events from the WFS from July 2016 to March 2022 are presented in Figure 2.

*Note***:** CPUE calculation - hook hours were based on 750 hooks per set. Species specific CPUE was multiplied by the number of the species caught during a haul and multiplied by 1,000 to generate a whole number (Equation: [Indiv_CPU_Hook_Hours_BLL] x 1000). The average CPUE of catch within a 10 x 10 minute grid cell was applied in the presented maps (Figures 1 and 2).

Condition on Arrival, Discards, and Depredation

The overall at-vessel mortality for this species was 4.93%, with 1.09% showing obvious physical indications of damage from depredation (Table 1). Discard rates were low (1.37%) with discarding generally attributed to undersized individuals or damaged catch (Table 2).

Table 1. Condition of gray snapper on arrival on BLL gear in the EGoM.

Condition On Arrival	% of Gray (Mangrove) Snapper
Dead on Arrival - Damaged	0.82
Dead on Arrival - Undamaged	4.11
Live - Damaged	0.27
Live - Healthy	56.71
Live - Stomach and/or Eyes Protruding	37.81
Unknown Condition	0.27

Table 2. Fate of gray snapper on BLL gear in the EGoM.

Catch Fate	% of Gray (Mangrove) Snapper
Discarded - Dead	0.82
Discarded - Live and Healthy (Not Vented)	0.27
Discarded - Live and Healthy (Vented)	0.27
Retained	98.63

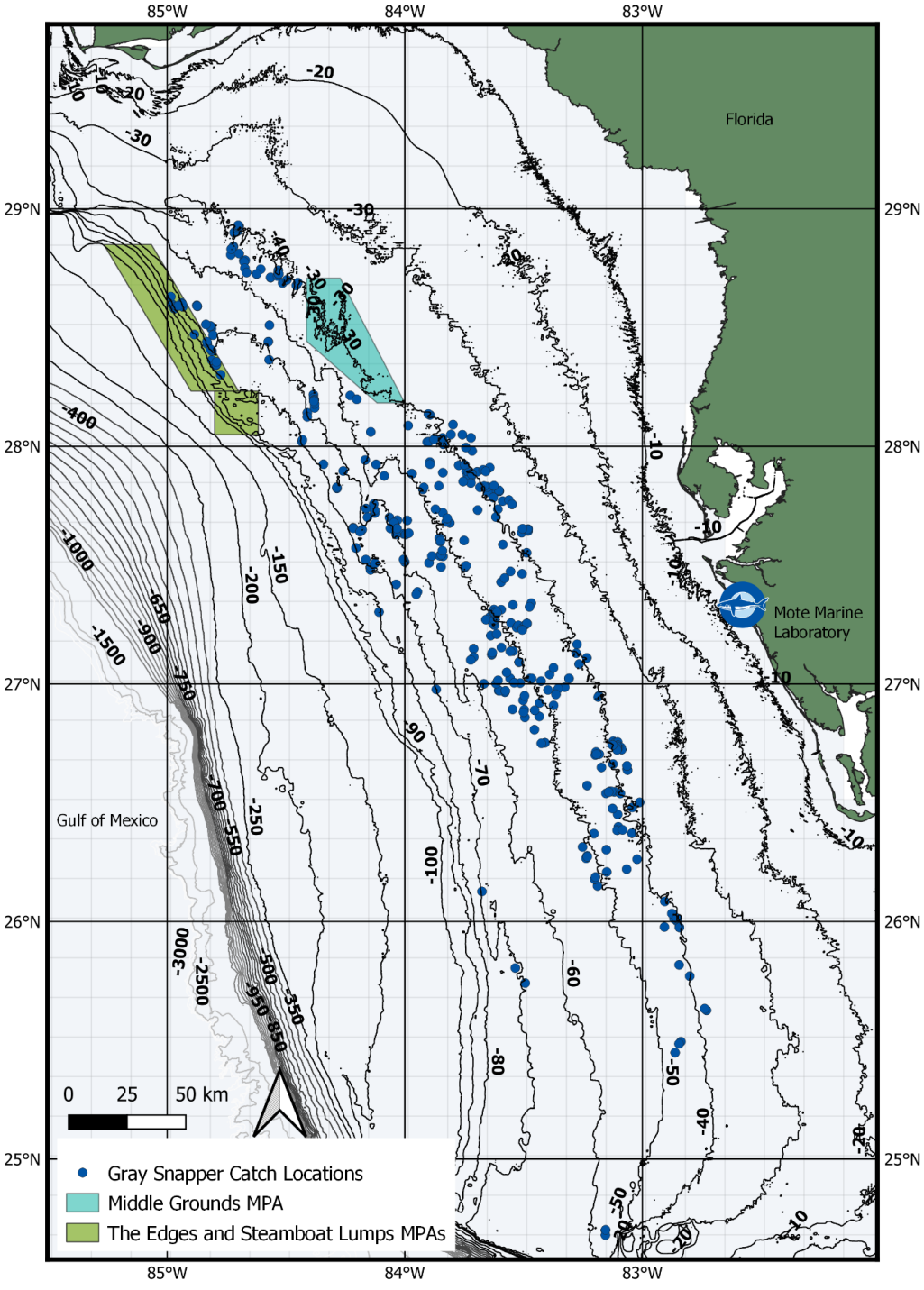

Figure 1. Catch locations for gray snapper in the EGoM BLL fishery.

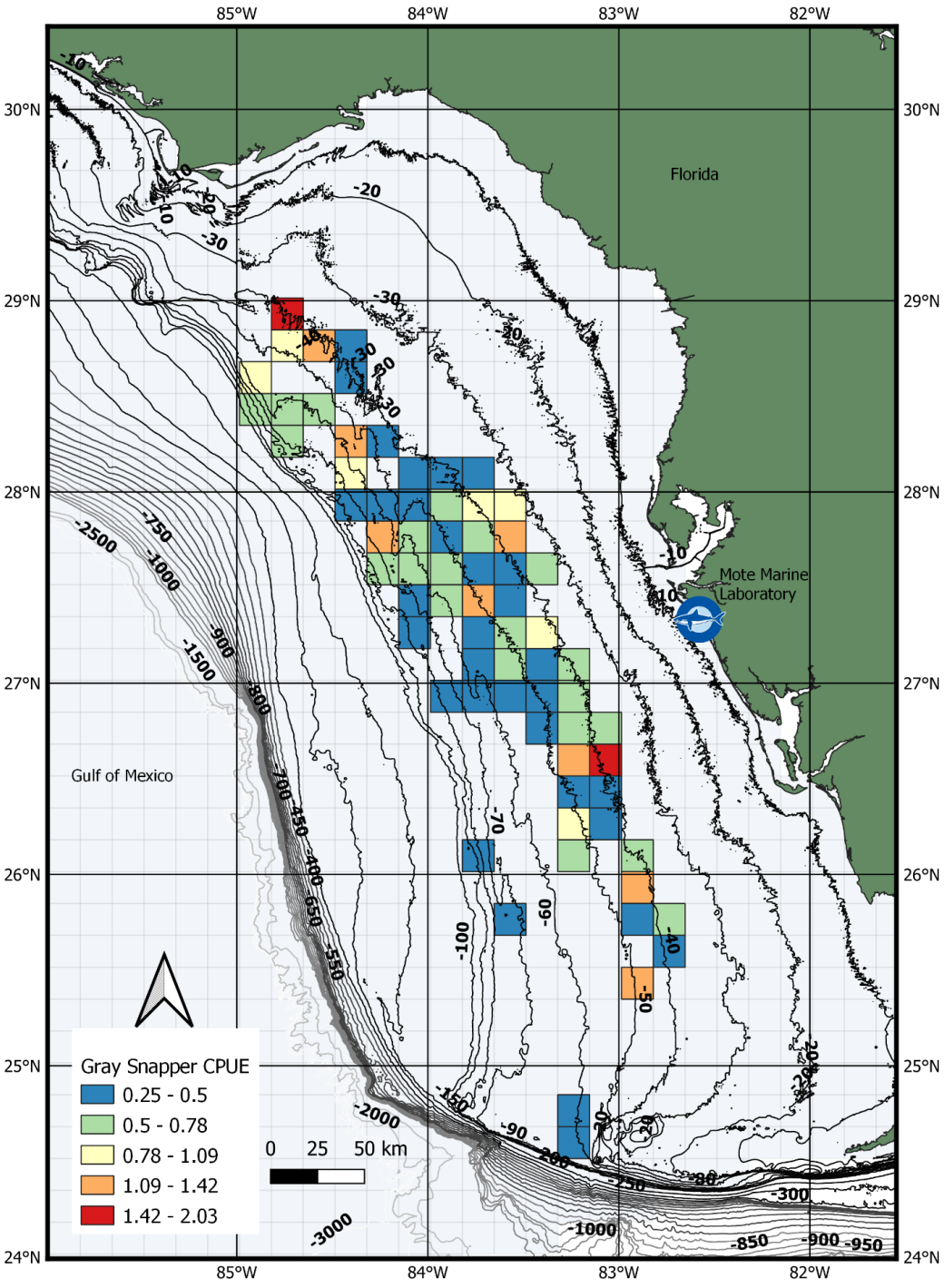

Figure 2. Catch per unit effort of gray snapper in the EGoM BLL fishery with a grid cell size of 10 x 10min.