

Preliminary Report

Resolving Barriers to Sustainable Fishery Certification for the Gulf of Mexico Federal Otter Trawl Shrimp Fishery

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The federally-permitted penaeid shrimp fishery of the Gulf of Mexico is one of the nation's most valuable fisheries. However, bycatch associated with shrimp trawls presents a serious challenge for meeting requirements for certification as a sustainable fishery. Without such certification, the shrimp industry is likely to lose market share to international competitors and may have difficulty selling their product to major seafood buyers (Walmart, Kroger, etc.). After decades of research and modifications to fishing gear and activity aimed at reducing bycatch, one of the main barriers to achieving sustainability certification is the "modified characterization protocol" of bycatch that is conducted by NMFS observers, whereby certain important species are recorded but a large percent of the bycatch is unidentified. LGL Ecological Research Associates was awarded a grant through NOAA's Saltonstall-Kennedy program to partner with the NMFS observer program to determine the unidentified species from a subset of samples for the year 2021. Below we describe the preliminary results of our characterization of the taxa that are typically unidentified.

Of the shrimp boats selected by NOAA's observer program, we requested captains volunteer to participate in this project. On vessels that agreed to participate, NMFS observers completed their regular sorting/identification duties and placed any unidentified samples in a mesh bag that was tagged with information necessary to uniquely identify that sample, so that this sample could be matched to the observer's data and also to determine date, location, tow duration, etc. Bags of bycatch were stored in the ship's freezer and returned to dock. LGL staff obtained the bycatch and transported them to an offsite location to obtain counts and weights for each taxon. Individuals were identified to the lowest possible taxonomic level (e.g., species or genus) by trained biologists. LGL staff characterized bycatch from 510 tows from 16 trips taken across the U.S. Gulf of Mexico. For a preliminary characterization of the "unobserved" bycatch we divided these tows into 5 spatial areas and 3 trimesters (Figure 1, Table 1). Below, we present the most commonly identified species in our samples by spatial area. Note, these data do not yet include the species identified by NOAA observers. The combined datasets will be presented in a more comprehensive report in the coming weeks.

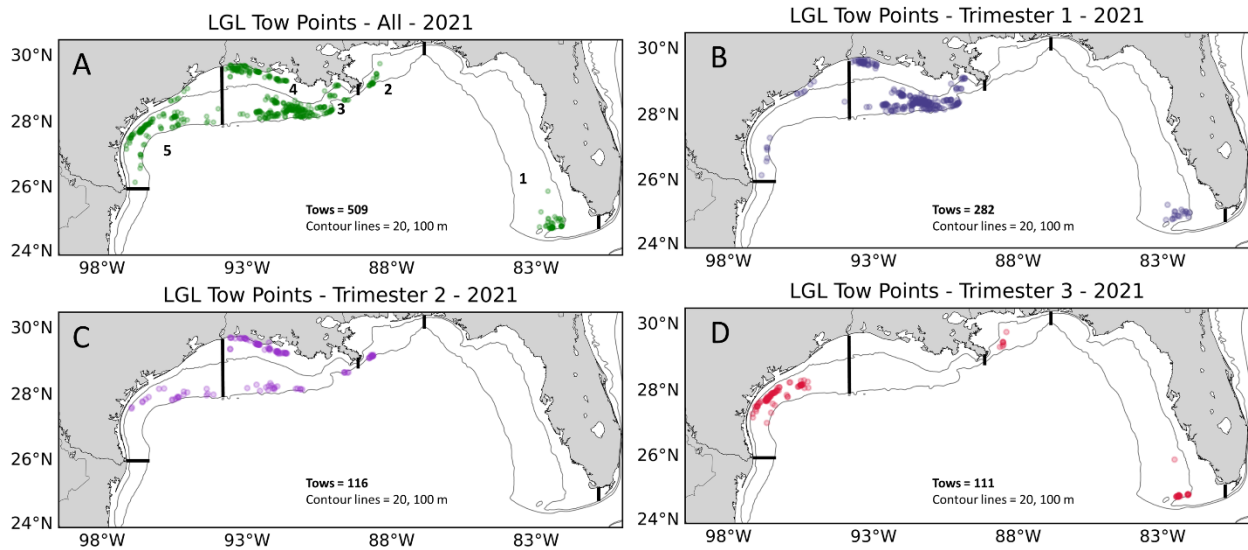


Figure 1. Distribution of tows sampled by LGL in 2021(n = 509), by trimester. Black lines and depth contours delineate spatial areas used in our preliminary analyses. A1 = South Florida; A2 = East Louisiana, Mississippi, and Alabama; A3 = Deep West Louisiana (> 20m); A4 = Shallow West Louisiana (< 20m); A5 = Texas.

Table 1. Percentages and numbers of tows sampled by LGL in 2021 by area and trimester.

	Trimester 1 (Jan. – Apr.)	Trimester 2 (May – Aug.)	Trimester 3 (Sept. – Dec.)	Total
A1 – South Florida	4.1% Tows = 21	0% Tows = 0	4.3% Tows = 22	8.4% Tows = 43
A2 – East Louisiana, Mississippi, Alabama	0% Tows = 0	2.8% Tows = 14	1.4% Tows = 7	4.1% Tows = 21
A3 – Deep West Louisiana (> 20 m)	38.7% Tows = 197	4.3% Tows = 22	0% Tows = 0	43.0% Tows = 219
A4 – Shallow West Louisiana (< 20m)	9.6% Tows = 49	11.4% Tows = 58	0% Tows = 0	21.0% Tows = 107
A5 – Texas	2.9% Tows = 15	4.3% Tows = 22	16.1% Tows = 82	23.4% Tows = 119
Total	55.4% Tows = 282	22.8% Tows = 116	21.8% Tows = 111	100% 509

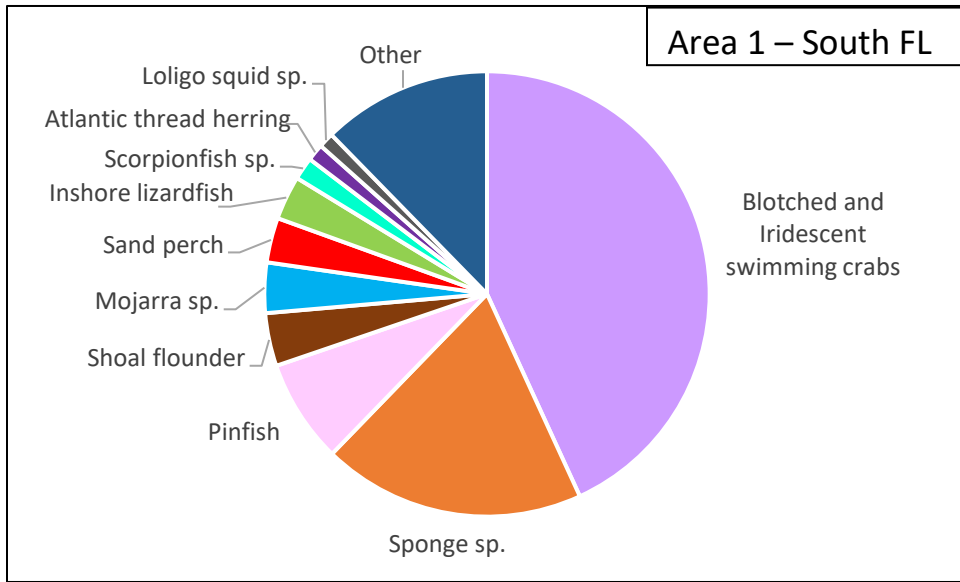


Figure 2. Top 10 species in Area 1 (South Florida), by percent of weight.

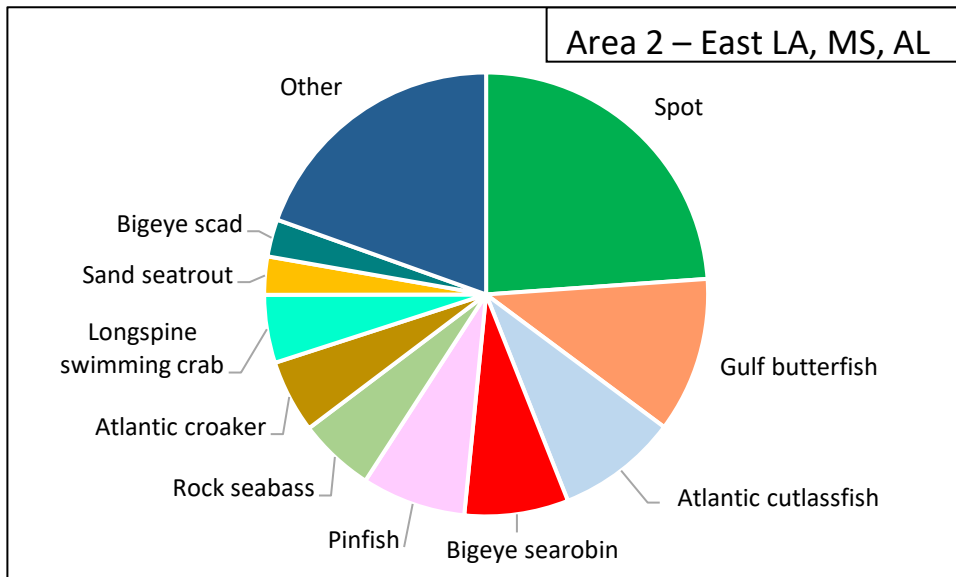


Figure 3. Top 10 species in Area 2 (East Louisiana, Mississippi, Alabama), by percent of weight.

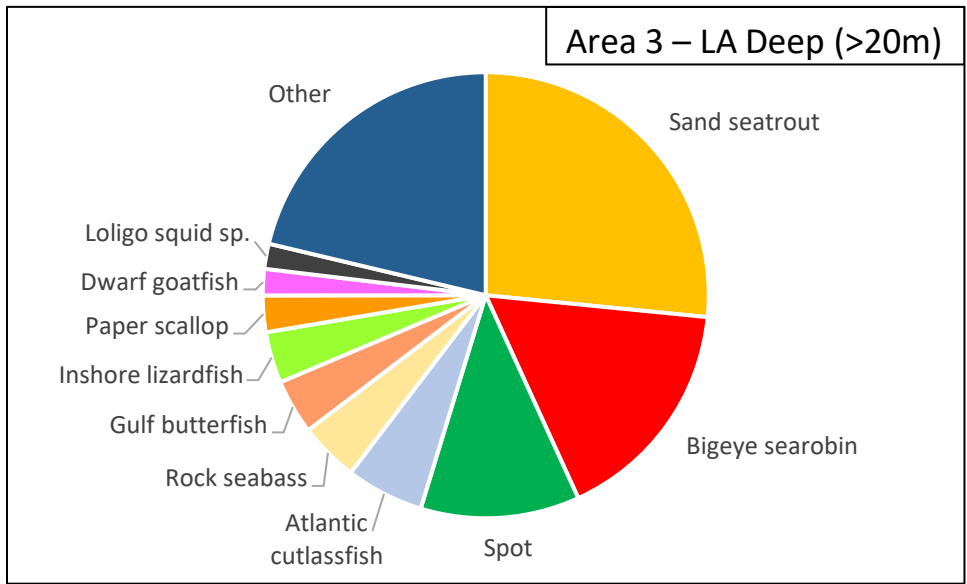


Figure 4. Top 10 species in Area 3 (Deep West Louisiana, > 20m), by percent of weight.

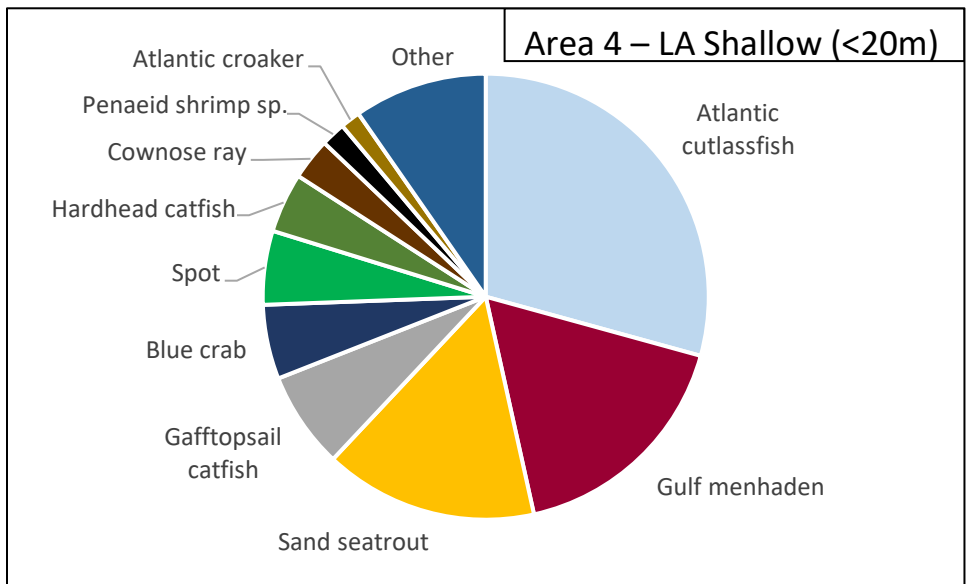


Figure 4. Top 10 species in Area 4 (Shallow West Louisiana, < 20m), by percent of weight.

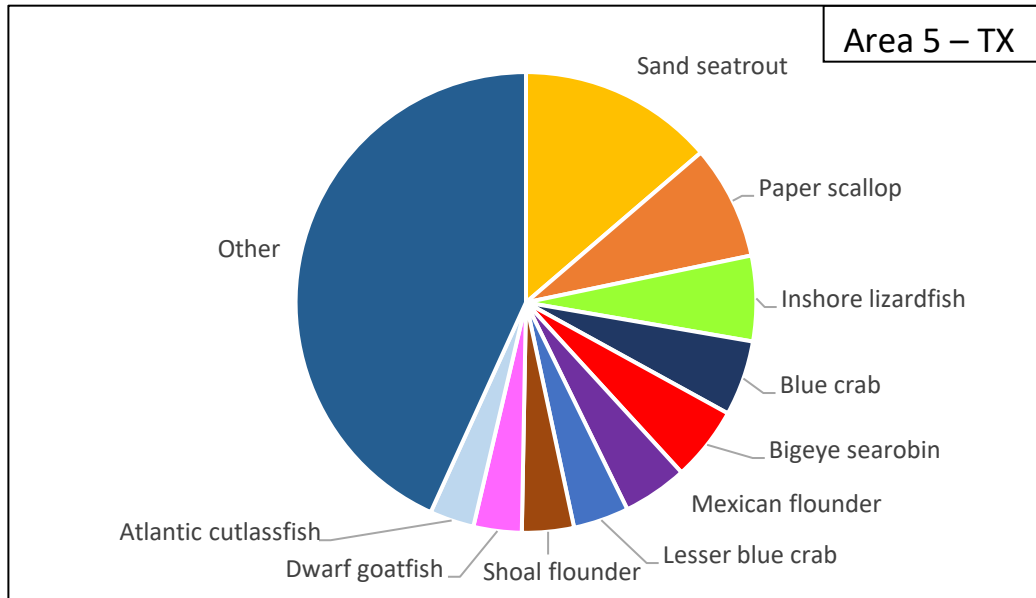


Figure 4. Top 10 species in Area 5 (Texas), by percent of weight.

Appendix. Tables of top 25 species that are unidentified by NOAA observers, by area.

Table A1. Top 25 species in Area 1 (South Florida), by weight.

Rank	Species	% of weight
1	Blotched and Iridescent swimming crabs	43.2%
2	Sponge sp.	19.1%
3	Pinfish	7.5%
4	Shoal flounder	3.8%
5	Mojarra sp.	3.7%
6	Sand perch	3.3%
7	Inshore lizardfish	3.2%
8	Scorpionfish sp.	1.6%
9	Atlantic thread herring	1.2%
10	Loligo squid sp.	1.1%
11	Common mantis shrimp	1.1%
12	Orange filefish	1.1%
13	Lavender rope sponge	0.6%
14	Atlantic midshipman	0.4%
15	Atlantic bumper	0.4%
16	Round scad	0.4%
17	Mexican flounder	0.3%
18	Round herring	0.3%
19	Scrawled cowfish	0.3%
20	Longspine swimming crab	0.3%
21	Polka-dot batfish	0.3%
22	Planehead filefish	0.3%
23	Puffer sp.	0.2%
24	Flame box crab	0.2%
25	Twospot flounder	0.2%

Table A2. Top 25 species in Area 2 (East Louisiana, Mississippi, Alabama), by weight. NOTE: Low sample sizes in this area may not provide results representative of the entire area.

Rank	Species	% of weight
1	Spot	23.9%
2	Gulf butterfish	11.3%
3	Atlantic cutlassfish	8.8%
4	Bigeye searobin	7.6%
5	Pinfish	7.6%
6	Rock seabass	5.5%
7	Atlantic croaker	5.3%
8	Longspine swimming crab	5.0%
9	Sand seatrout	2.8%
10	Bigeye scad	2.7%
11	Yellow box crab	2.7%
12	Inshore lizardfish	2.5%
13	Scaled sardine	1.9%
14	Longspine porgy	1.3%
15	Penaeid shrimp sp.	1.2%
16	Dwarf goatfish	1.1%
17	Loligo squid sp.	0.8%
18	Roundel skate	0.8%
19	Wenchman	0.7%
20	Rough scad	0.7%
21	Southern flounder	0.6%
22	Mexican flounder	0.5%
23	Blackedge cusk-eel	0.5%
24	Banded drum	0.4%
25	Lesser blue crab	0.3%

Table A3. Top 25 species in Area 3 (Deep West Louisiana, > 20m), by weight.

Rank	Species	% of weight
1	Sand seatrout	26.6%
2	Bigeye searobin	16.6%
3	Spot	11.5%
4	Atlantic cutlassfish	5.6%
5	Rock seabass	4.3%
6	Gulf butterfish	4.0%
7	Inshore lizardfish	3.7%
8	Paper scallop	2.6%
9	Dwarf goatfish	1.9%
10	Loligo squid sp.	1.8%
11	Rough scad	1.3%
12	Atlantic moonfish	1.3%
13	Blackedge cusk-eel	1.2%
14	Banded drum	1.1%
15	Mexican flounder	1.1%
16	Sash flounder	1.0%
17	Longspine swimming crab	1.0%
18	Pinfish	0.9%
19	Gafftopsail catfish	0.9%
20	Wenchman	0.9%
21	Scaled sardine	0.7%
22	Blackear seabass	0.7%
23	Offshore mantis shrimp	0.6%
24	Common mantis shrimp	0.6%
25	Southern hake	0.6%

Table A4. Top 25 species in Area 4 (Shallow West Louisiana, < 20m), by weight.

Rank	Species	% of weight
1	Atlantic cutlassfish	29.3%
2	Gulf menhaden	17.3%
3	Sand seatrout	15.5%
4	Gafftopsail catfish	7.0%
5	Blue crab	5.4%
6	Spot	5.4%
7	Hardhead catfish	4.3%
8	Cownose ray	3.0%
9	Penaeid shrimp sp.	1.8%
10	Atlantic croaker	1.4%
11	Atlantic stingray	1.3%
12	Star drum	1.1%
13	Striped anchovy	1.0%
14	Atlantic brief squid	1.0%
15	Common mantis shrimp	0.8%
16	Threadfin shad	0.7%
17	Harvestfish	0.5%
18	Southern kingfish	0.4%
19	Southern flounder	0.4%
20	Gulf butterfish	0.3%
21	Atlantic moonfish	0.2%
22	Flounder sp.	0.2%
23	Atlantic bumper	0.2%
24	Inshore lizardfish	0.2%
25	Bigeye searobin	0.2%

Table A5. Top 25 species in Area 5 (Texas), by weight.

Rank	Species	% of weight
1	Sand seatrout	13.7%
2	Paper scallop	8.0%
3	Inshore lizardfish	6.0%
4	Blue crab	5.3%
5	Bigeye searobin	5.2%
6	Mexican flounder	4.5%
7	Lesser blue crab	3.9%
8	Shoal flounder	3.6%
9	Dwarf goatfish	3.4%
10	Atlantic cutlassfish	3.1%
11	Loligo squid sp.	2.8%
12	Longspine swimming crab	2.7%
13	Spot	2.7%
14	Hardhead catfish	2.4%
15	Atlantic moonfish	2.2%
16	Wenchman	2.2%
17	Rock seabass	2.0%
18	Common mantis shrimp	1.9%
19	Rough scad	1.9%
20	Gulf butterfish	1.5%
21	Blackear seabass	1.5%
22	Striped anchovy	1.5%
23	Smooth puffer	1.5%
24	Banded drum	1.4%
25	Blackedge cusk-eel	1.0%