

NOAA FISHERIES SMALLTOOTH SAWFISH MONITORING SURVEY-FY25
Relative Abundance and Essential Fish Habitat Studies for Smalltooth Sawfish, *Pristis pectinata*, in Southwest Florida, USA

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Background

Life history characteristics, abundance, habitat use, movement, and migration patterns are necessary to facilitate the recovery of the U.S. Distinct Population Segment (DPS) of smalltooth sawfish, *Pristis pectinata*. A multi-disciplinary approach focusing research on action items listed in the Smalltooth Sawfish Recovery Plan (NOAA 2009a) has occurred since 2009. One of the high priority tasks outlined in the plan is abundance and recruitment of juvenile sawfish. In addition, identifying habitat use and movements of both juvenile and mature sawfish are of high priority. One of the most important regions for young-of-the-year (YOY) and small juveniles is coastal southwest Florida (Brame et al., 2019, Kroetz et al., 2025a, 2025b). This report describes the results from the 2025 NOAA Fisheries Panama City Laboratory juvenile smalltooth sawfish monitoring survey in southwest Florida from Marco Island to Florida Bay as well as the large juvenile and mature sawfish survey conducted by Florida State University spanning from the big bend region of Florida to Cape Canaveral including the Everglades National Park (including Florida Bay) and inshore/offshore of the Florida Keys, both conducted under protected species permit #ESA 22078, EVER-2024-SCI-0007, and EVER-2025-SCI-0028.

Methods

Surveys

Areas surveyed via gillnets were located within the Ten Thousand Islands/Everglades Unit of designated critical habitat (74 FR 45353; NOAA 2009b) in southwest Florida from Marco Island to Florida Bay. Areas surveyed by bottom longline gear included Big Bend, Tampa Bay, Cape Canaveral and spanned the lower portion of the Ten Thousand Islands/Everglades Unit of designated critical habitat from Florida Bay to both inshore and offshore of the Florida Keys (Figure 1). Backwaters within the region of gillnet and longline surveys and coastal waters of the Florida Keys were categorized into six sub-regions (north to south, Figure 1): Big Bend, Cape Canaveral, Tampa Bay, Ten Thousand Islands National Wildlife Refuge (TTINWR), Northern Everglades National Park (NENP: Chokoloskee Island to the entrance of the Rodgers-Broad River), Whitewater and Coot Bays, Florida Bay including the Flamingo region, and the Florida Keys National Marine Sanctuary (FKNMS) and inshore/offshore of Florida Keys.

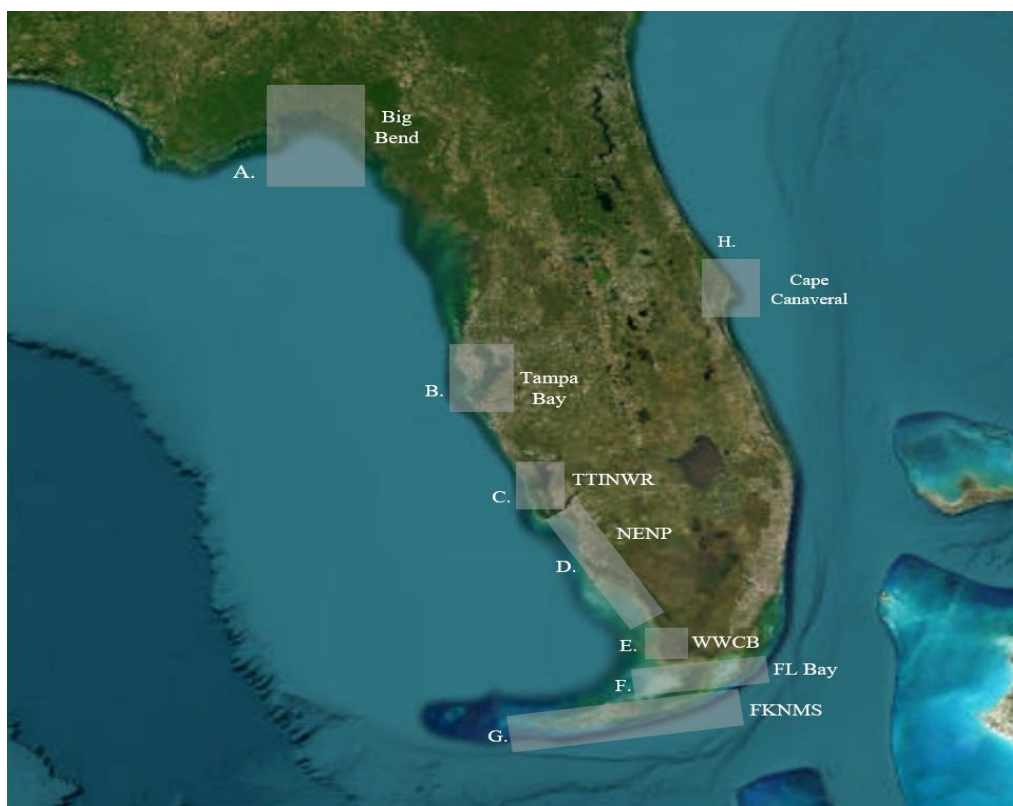


Figure 1. Eight sub-regions of the 2025 NOAA Fisheries Panama City Laboratory smalltooth sawfish gillnet survey and Florida State University bottom longline survey: A. Big Bend, B. Tampa Bay, C. Ten Thousand Islands National Wildlife Refuge, D. Northern Everglades National Park, E. Whitewater and Coot Bays, F. Florida Bay, G. Florida Keys National Marine Sanctuary (FKNMS), Inshore/offshore Florida Keys, and H. Cape Canaveral.

Specific sampling locations within sub-regions were determined by (1) previous surveys (Wiley and Simpfendorfer 2007, Bethea et al. 2015 and references therein, Kroetz et al. 2019 and references therein), (2) queries of the public encounter data where sawfish have been reported available from the Smalltooth Sawfish Recovery Implementation Team via Florida Fish and Wildlife Conservation Commission Charlotte Harbor Field Laboratory Port Charlotte, FL, and (3) random sampling conducted in documented critical habitat type (e.g., mangrove fringed mud flats less than 1.0 m at mean high tide for gillnets).

Gillnets and bottom longline sampling gear were used in the surveys. Due to space (i.e., small channels, shallow mud flats, and beaches around mangrove islands and keys), gillnets were 5 ft (1.5 m) deep and either 100 or 200 ft long (30.5 or 61.0 m) with a mesh size of 4.0 in (10.2 cm). Nets had a continuous float and lead line, were anchored at each end with one eight-pound mushroom anchor, and marked with large surface buoys at each end. Nets were fished one at a time, monitored continuously, soaked for at least 1.0 hour, and checked for catch every 0.5 hours or immediately if any animals were observed in the gear. All sets were made during daylight hours. Gillnet set soak time was defined from the time the gear entered the water to the time the gear was completely removed from the water. Catch-per-unit-effort (CPUE) was defined as the number of sawfish of each life stage caught in each sub-region divided by gillnet set soak time (standardized to gillnet hour). CPUE for the bottom longline survey was calculated as the number of sawfish/hooks and was calculated by sub-region. Large juvenile and mature sawfish were combined for analysis.

Bottom longline gear was deployed in deeper areas to capture large juvenile and mature smalltooth sawfish. Longlines consisted of a 4.0 mm monofilament mainline that was anchored on each end and marked with a buoy bearing the permit numbers. A standard set included 50 gangions consisting of a stainless-steel tuna clip with an 8/0 stainless steel swivel attached to 2.5 m of 300 kg monofilament that was attached to 16/0 circle hooks. The hooks were baited with ladyfish (*Elops saurus*) and soak times were one hour. The line was hauled in the order and direction it was set and smalltooth sawfish were sampled as they were caught during retrieval.

Sample collection, tagging, and recaptures

Captured smalltooth sawfish were measured (rostral length, RL; precaudal length, PCL; fork length, FL; stretched total length, STL, in cm), sexed (if male, inner and outer right clasper length, CL, measured in cm), and life history stage assessed: neonate defined by an open yolk-sac scar and/or remnants of the protective sheath around the rostral teeth; YOY had a closed yolk-sac scar and were <150 cm STL, and juvenile were ≥150 cm STL, following Brame et al. (2019). Mature individuals were determined using size-at-maturity information from Kroetz et al. (2025). Rostral teeth were counted (left and right, independently) and a 1.0 g piece of a pelvic fin was removed from new captures only and archived in EtOH for genetic research. A 1.0 g muscle biopsy was taken from sawfish, stored in a cryovial, and frozen for trophic ecology analyses. A 1-5 ml blood sample was taken for reproductive and stress hormone analyses as well as for heavy metal contamination (sent our colleague, Dr. James Gelsleichter, at the University of North Florida in Jacksonville, FL). A cloacal swab was taken and stored frozen for FWC. When observed, fecal matter was collected and preserved by freezing for trophic analysis. New captures were tagged externally under the first dorsal fin with either a plastic-headed or metal-headed streamer dart-tag (©Hallprint Fish Tags) and internally at the base of either the first or second dorsal with a PIT-tag (©Digital Angel & Biomark). Two types of ©Vemco coded acoustic tags were surgically implanted in juvenile and adult sawfish. Sawfish between 100-200 cm STL were implanted with V16-4x (16 mm diameter, 10.3 g wet, battery life 3650 days, code transmission every 80-160 seconds) and sawfish ≥201 cm STL were implanted with V16 (16 mm diameter, 17.3 g wet, battery life 3650 days, code transmission every 70-150 seconds) tags. Recaptured animals were distinguishable by the presence of an external tag, the presence of an internal PIT tag upon thorough scanning, and/or the absence of the small trailing edge of the right pelvic fin. Recaptured animals were examined in the same manner as new captures and missing external tags were replaced. After examination and tagging, all animals were photographed (dorsal and ventral) and released with the time noted.

Elasmobranchs other than sawfish were measured (PCL, FL, and STL in cm for sharks; disc-width, DW, in cm for batoids), sexed, assigned a life stage, tagged externally under the first dorsal fin with a plastic-headed streamer dart-tag (sharks <120 cm STL; ©Hallprint Fish Tags.) or metal-headed streamer dart tag (sharks ≥120 cm STL; ©Hallprint Fish Tags) and released. Neonates were defined as having an open umbilical scar and YOY were defined as having a closed, but visible, umbilical scar. Mature individuals were defined based on macro-analysis or published accounts of 50% size-at-maturity. Captured teleosts were measured (FL and/or TL in cm) and released. A 1.0 g piece of pelvic fin was removed

and archived in EtOH from captured elasmobranchs for genetic research.

Essential fish habitat profiles

For each gillnet set, surface water temperature (°C), salinity, and dissolved oxygen (mg l⁻¹) were recorded using an YSI Pro2030 environmental meter (YSI Inc. /Xylem Inc.). Average depth (in meters) was calculated using gear start and end points recorded from the vessel's depth finder. Water clarity was measured using a secchi disc (depth of the photic zone in cm) and tidal stage and orientation of the set (i.e., against the shoreline) were noted. Qualitative information was gathered on bottom type (e.g., mud, sand, set on mudflat/slope) and it was noted if a sawfish was seen at net set. For each longline set, water temperature (°C), salinity, and dissolved oxygen (mg l⁻¹) were recorded at the surface, mid-depth and on bottom using an YSI Pro2030 environmental meter (YSI Inc. /Xylem Inc.). Minimum and maximum depth (in meters) was recorded using the vessel's sonar. Water clarity was measured using a secchi disc and tidal stage was recorded.

Results

A total of 35 gillnet sets were made over 7 sampling days in April (Figure 2), capturing 8 YOY and 4 juvenile smalltooth sawfish (n=12, Table 1). The CPUE by life stage and sub-region can be found in Table 3. Generally, animals were captured in shallow (0.3 – 0.7 m) and warm (24.5– 31.2 °C) water and in relatively wide ranges of salinities (10.5 – 44.2 ppt). Dissolved oxygen could not be measured for the juvenile survey in 2025 due to a malfunction in the YSI unit. Sawfish were captured against red and black mangrove shorelines with muddy bottom types. A fin clip was taken from 4 of the animals for genetic research, and 4 were internally acoustically tagged.

A total of 164 bottom longline sets were made over 27 sampling days on six trips in February, April, May, June, and November (Figure 3) capturing 23 smalltooth sawfish; 2 juvenile females, 4 mature females, 5 juvenile males, and 11 mature males, and one sawfish of unknown sex and maturity that was lost at the vessel (n=23, Table 2) in the primary survey region. Longlines conducted in the Big Bend region by co-PI Grubbs are annual surveys for local elasmobranchs and sets were standardized to those used in sawfish monitoring; thus, this region was included in CPUE. The CPUE by sub-region can be found in Table 3. Generally, the sawfish were captured between 2.4 and 63.6 m of water that was warm (23.0-25.8 °C), had a range of DO between 4.69 and 6.95 mg/L, and a salinity range of 31.1-38.2. A fin clip and muscle biopsy were taken from each sawfish; all animals were internally acoustically tagged.

The smallest sawfish captured in the 2025 gillnet survey was caught in the northern Everglades National Parks Chokoloskee Bay (75.0 cm STL, male; Table 1) and the largest was caught in the Ten Thousand Islands National Wildlife Refuges Tripod Key (170 cm STL, female; Table 1). The largest sawfish captured on longline was in the Southern Everglades National Park Joe Kemp Key (421 cm STL male; Table 2). No sawfish were tagged with satellite tags.

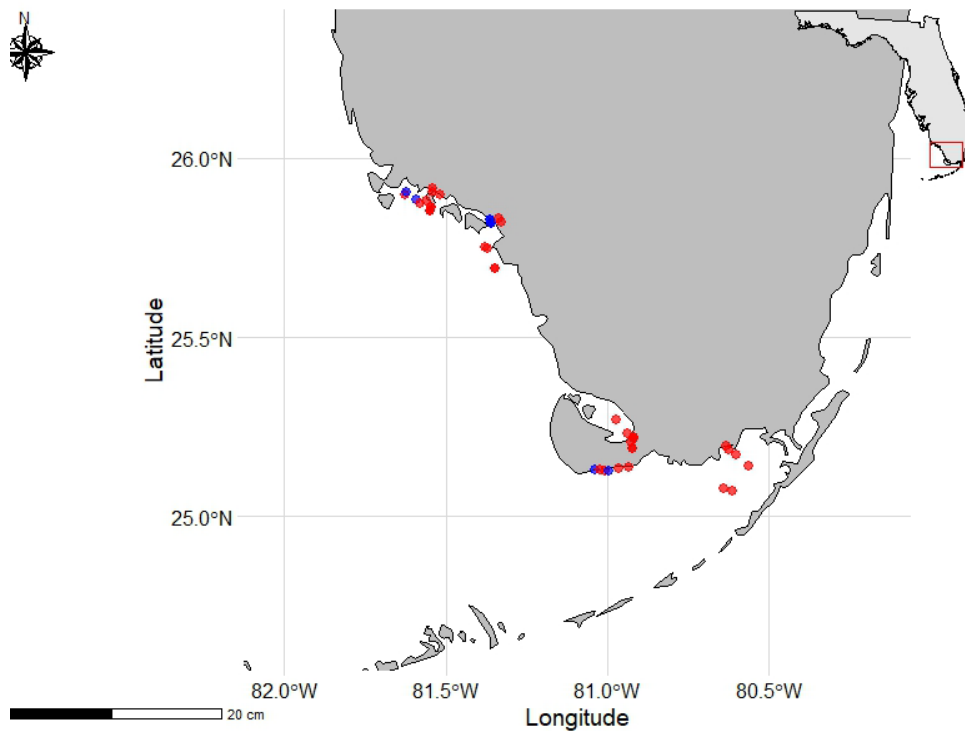


Figure 2. Distribution of all gillnet sets in the 2025 NOAA Fisheries Panama City Laboratory smalltooth sawfish gillnet survey (n=35). Red circles indicate a gillnet set and blue circles are locations of positive smalltooth sawfish captures (n=12).

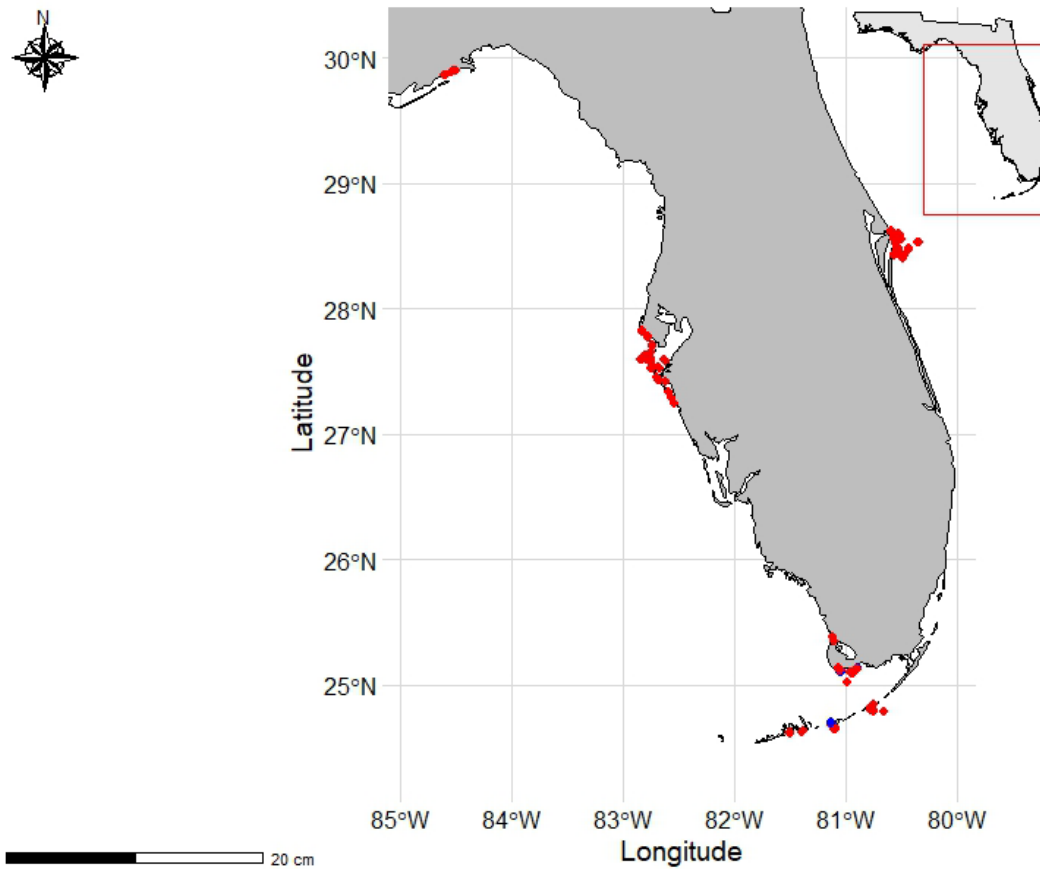


Figure 3. Distribution of bottom longline sets in the 2025 NOAA Fisheries Panama City Laboratory/Florida State University Sustainable Fisheries Division; SFD-2026-01

smalltooth sawfish bottom longline survey (n=164). Red circles indicate a bottom longline set and blue circles are locations of positive smalltooth sawfish captures (n=23).

Gillnet Sets

Ten Thousand Islands National Wildlife Refuge (TTINWR)

Monitoring in this sub-region was conducted April via ten gillnet sets over three sampling days.

Sets were made around Panther Key, Tripod key, Faka Union Bay, Pumpkin Bay, and Goodland Bay (Figure 4).

Information was collected on two juvenile female smalltooth sawfish that were captured along the shore line of Turtle Key (125 cm STL) and Tripod Key (170 cm STL). The sawfish were internally acoustically tagged with 10-year acoustic tags (Table 1). No recaptures occurred in this sub-region in 2025. Other elasmobranchs captured in this sub-region included bonnethead (*Sphyrna tiburo*), lemon (*Negaprion brevirostris*), and finetooth (*Carcharhinus isodon*) sharks (Table 5).

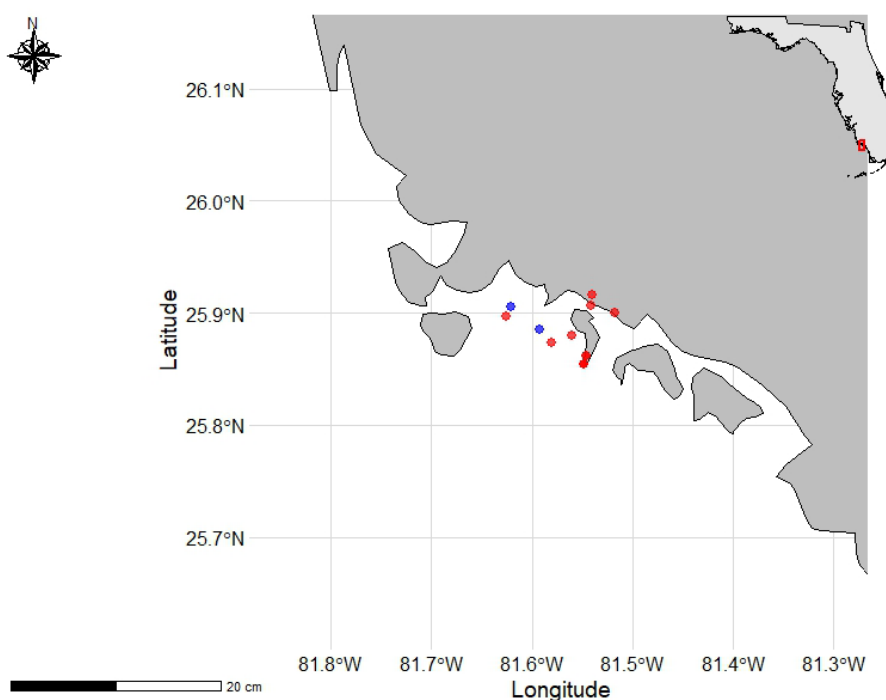


Figure 4. Distribution of 2025 gillnet sets in the Ten Thousand Islands National Wildlife Refuge (TTINWR) sub-region (n=10). Red circles indicate a gillnet set and blue circles indicate sets with positive smalltooth sawfish captures (n=2).

Northern Everglades National Park (NENP)

Monitoring in this sub-region was conducted in April via seven gillnet sets over two sampling days. Sets were made around Chokoloskee Island, in the Lopez River, the Turner River, and around Pavilion Key (Figure 5). Two of the sets were made from the shoreline around Chokoloskee Island (e.g., nets were walked from the shore out into the water without a vessel) and all of the eight sawfish were captured in this manner. Information was collected on six YOY and two juvenile smalltooth sawfish (n=8), captured around Chokoloskee Island (Table 1; Figure 5). Two animals were implanted with a 10-year acoustic tag, including a 101.0 cm STL juvenile male was recaptured from this region after 460 days at liberty growing 36 centimeters for a new recorded length of 137.0 cm STL (Table 3). No other elasmobranchs were captured in this sub-region (Table 5).

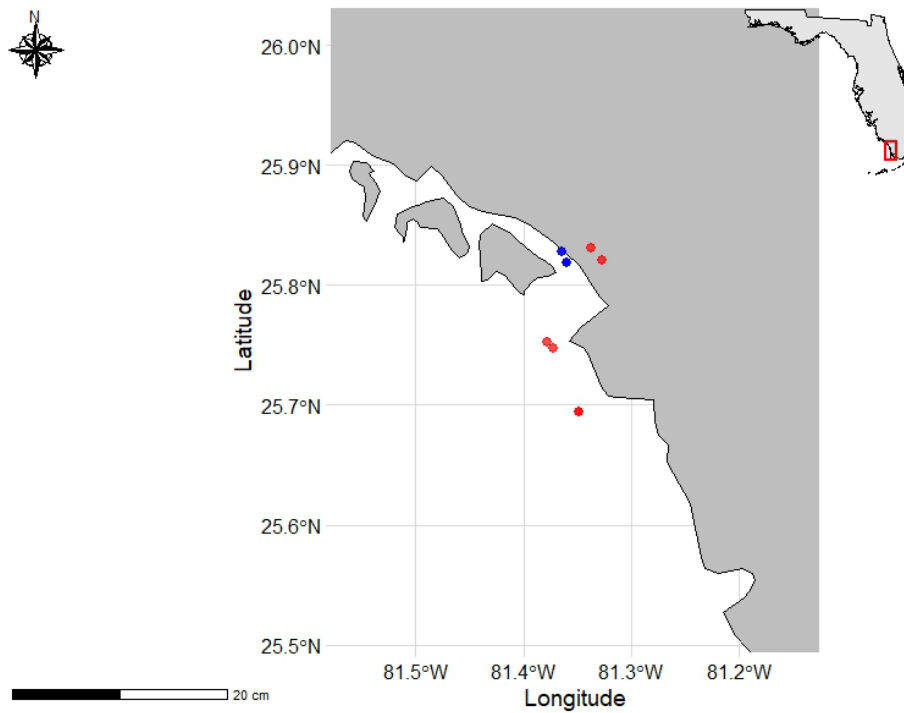


Figure 5. Distribution of 2025 gillnet sets in the northern Everglades National Park (NENP) sub-region (n=7). Red circles indicate gillnet sets and blue circles indicate sets with positive Smalltooth sawfish captures (n=8).

Whitewater and Coot Bays,

Monitoring in the Whitewater and Coot Bays sub-regions was conducted in April via six gillnet sets over one day of sampling (Figure 6). No smalltooth sawfish were captured in these sub-regions and bull sharks (*C. leucas*) were the only other elasmobranchs captured (Table 5).

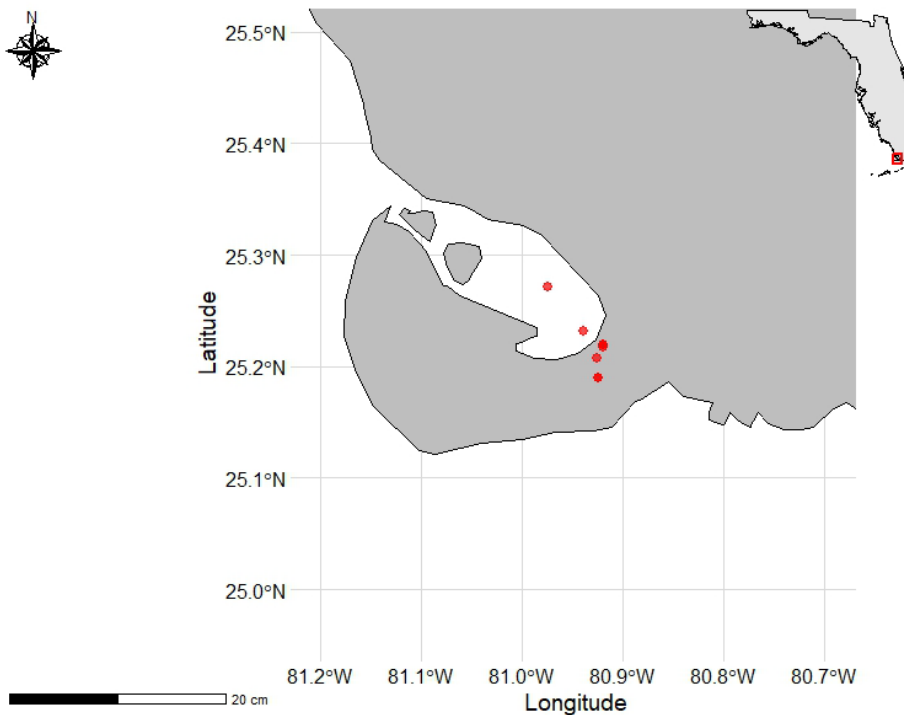


Figure 6. Distribution of 2025 gillnet sets in the Whitewater and Coot Bays (WWCB) sub-regions (n=6). Red circles indicate gillnet sets

Florida Bay (including Flamingo)

Monitoring in the Florida Bay sub-region was conducted in April via twelve gillnet sets over two days of sampling. Sets were made along the shoreline of Flamingo (Figure 7), and within Florida Bay including; Eagle Key, Russel Key, Little Madeira Bay, and at many other keys throughout Florida Bay (Figure 8). Information was collected on two young-of-the-year smalltooth sawfish captured in this sub-region at clubhouse beach (83.0 cm STL, male) and along the Flamingo shoreline (80.0 cm STL, female). No smalltooth sawfish were captured in these sub-regions, other elasmobranchs captured included bull (*C. leucas*) and lemon (*N. brevirostris*) sharks (Table 5).

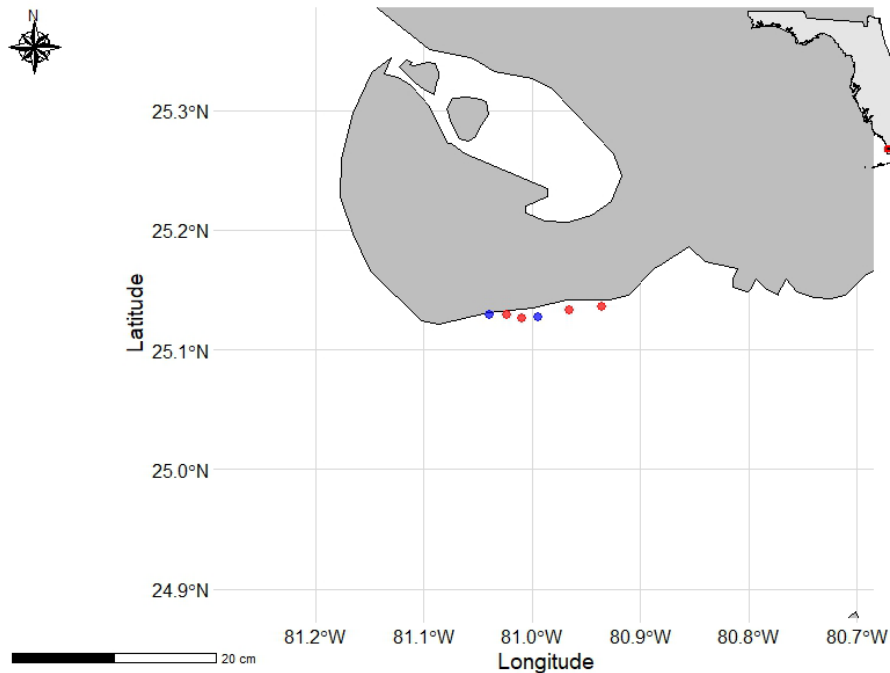


Figure 7. Distribution of 2025 gillnet sets in the Florida Bay sub-region along the shoreline (n= 6). Red circles indicate gillnet sets and blue circles indicate sets with positive Smalltooth sawfish captures (n = 2).

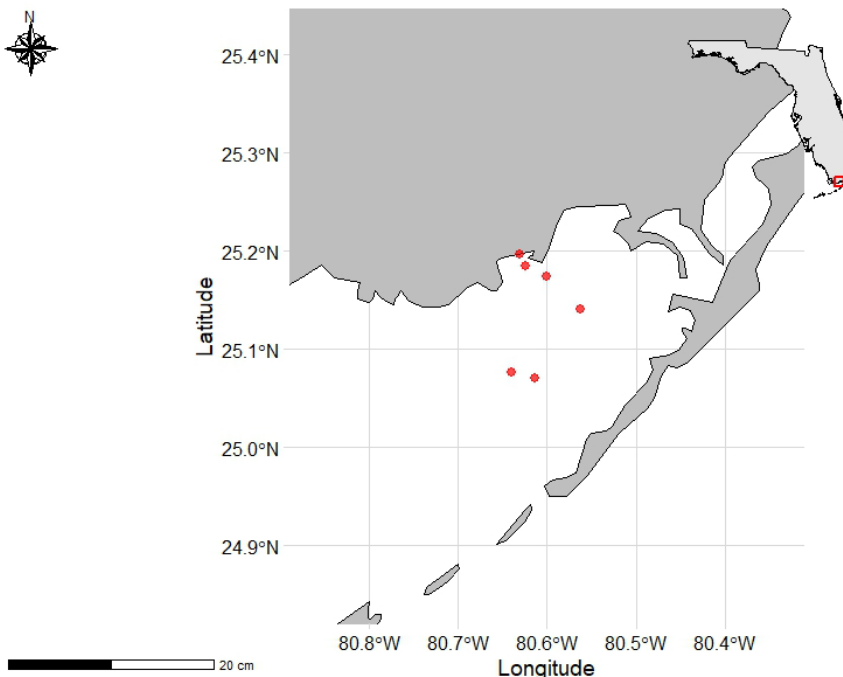


Figure 8. Distribution of 2025 gillnet sets in the Florida Bay sub-region at many keys throughout the bay (n= 6). Red circles indicate

gillnet sets.

Bottom Longline

Southern Everglades National Park (SENP)

Bottom longline sampling was conducted with 31 sets in the southern Everglades National Park sub-region and northern Florida Bay during February, April, and November (Figure 9). A total of fourteen sawfish were captured in this area (Table 2). Specifically, one mature male sawfish was caught at Conchie Channel. At Joe Kemp Key, the catch included three mature males and one sawfish of unknown sex and maturity that was lost at the boat. Middleground yielded the highest number of captures: five juvenile males, two mature males, and two juvenile females (Table 2). All captured sawfish were implanted with 10-year acoustic tags. One sawfish, a juvenile male measuring 321 cm STL, was recaptured in Middleground after 2,425 days at liberty; it had originally been tagged by FWC in Caloosahatchee at 122.3 cm STL (Table 3). Other elasmobranch species caught included the blacknose (*Carcharhinus acronotus*), blacktip (*C. limbatus*), bull (*C. leucas*), nurse (*Ginglymostom. cirratum*), lemon (*Negaprio. brevirostris*), great hammerhead (*Sphyrna mokarran*), and tiger (*Galeocer. cuvier*) sharks, as well as the southern stingray (*Hypanus americanus*) (Table 7).

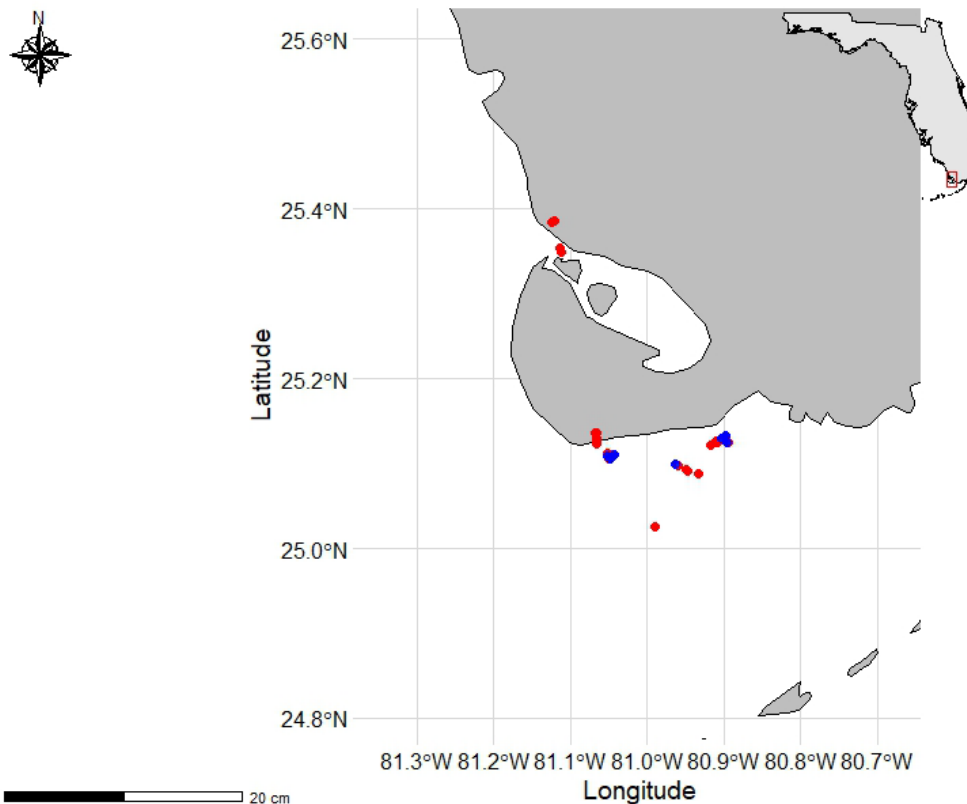


Figure 9. Distribution of bottom longline sets within Everglades National Park boundaries (e.g., sets within Florida Bay) in 2025 (n=31). Red circles indicate bottom longline sets and yellow circles indicate sets with positive Smalltooth sawfish capture (n=14).

Florida Keys National Marine Sanctuary-Inshore/Offshore Florida Keys

Fifty-one bottom longline sets were executed in February, April, and November within the Florida Keys National Marine Sanctuary and the surrounding inshore/offshore Florida Keys sub-region (Figure 10). This effort resulted in the capture of nine smalltooth sawfish. Specifically, five sawfish (one mature female and four mature males) were caught near the 7-mile bridge, two additional mature females were captured at the Queen of Nassau wreck, and one mature male and one mature female were documented at the slough east of Channel 5 (Table 2). All nine sawfish were subsequently implanted with 10-year acoustic tags (Table 2). This sub-region also yielded three sawfish recaptures: a 414 cm STL mature male, originally tagged by the research team in the Turner River in 2013, was recaptured after 4,672 days at liberty, showing a growth of 330.5 cm in length; a 377 cm STL mature male, originally tagged by FWC in Matlacha Pass at 128.9 cm STL, was recaptured after 4,278 days at liberty; and a 383 cm STL mature female, originally tagged in Faka Union Bay, was recaptured 2,598 days later, having grown 258 cm STL during that time (Table 3). Other elasmobranchs captured using the bottom longline sets included several shark species (Table 6), such as blacknose (*C. acronotus*), blacktip (*C. limbatus*), Atlantic sharpnose (*R. terraenovae*), nurse (*G. cirratum*), lemon (*N. brevirostris*), scalloped hammerhead (*S. lewini*), great hammerhead (*S. mokarran*), bonnethead (*S. tiburo*), and tiger (*G. cuvier*) sharks (Table 7).

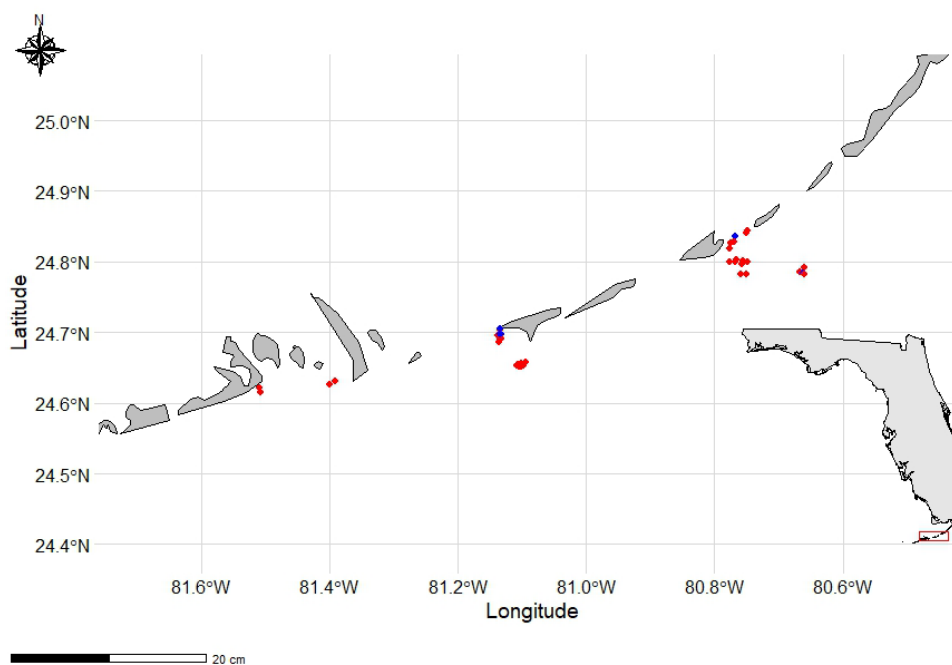


Figure 10. Distribution of bottom longline sets within the inshore/offshore Florida Keys (n=51) sub-region. Red circles indicate bottom longline sets and yellow circles indicate sets with positive smalltooth sawfish captures (n=9).

Tampa Bay

Fourty bottom longline sets were made in the Tampa Bay sub-region of northwest Florida in June (Figure 11). No sawfish were captured in this region. Other elasmobranchs captured from bottom longline sets include blacknose (*C. acronotus*), spinner (*C. brevipinna*), blacktip (*C. limbatus*), bull (*C. leucas*), Atlantic sharpnose (*R. terraenovae*), nurse (*G. cirratum*), lemon (*N. brevirostirs*), bonnethead (*S. tiburo*), and great hammerhead (*S. mokarran*) sharks (Table 7).

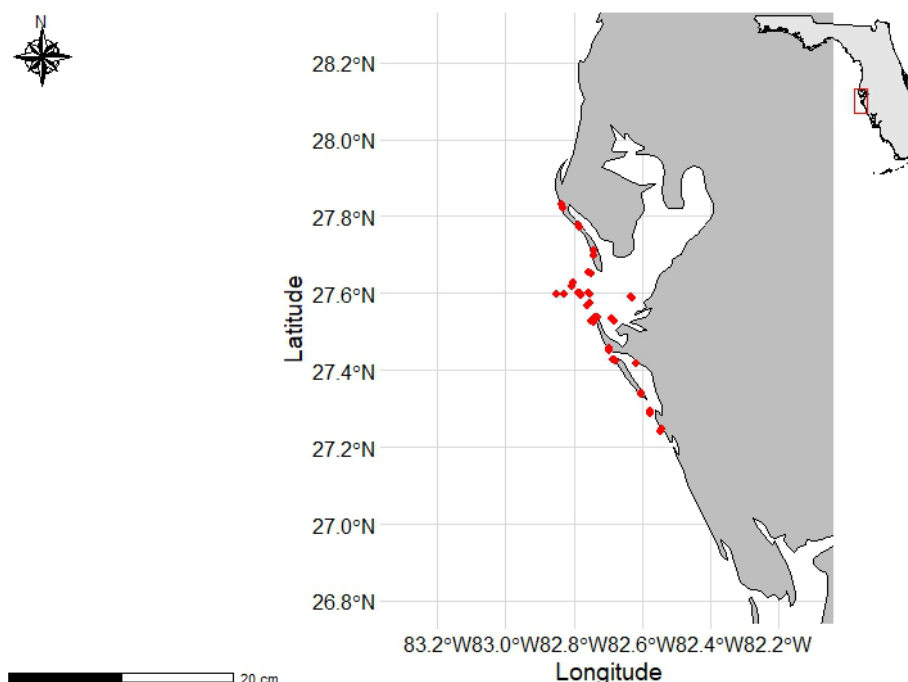


Figure 11. Distribution of bottom longline sets within the Tampa Bay sub-region of Florida (n=40). Red circles indicate bottom longline sets.

Big Bend in northwest Florida

Ten bottom longline sets were made in the Big Bend region of northwest Florida in May and June (Figure 12). These longline sets were not conducted as part of the sawfish monitoring survey with the intent to capture and tag sawfish, but rather as part of an annual summer course for undergraduate students taught by co-PI Grubbs in collaboration with the University of Florida. No smalltooth sawfish were captured in this sub-region. Other elasmobranchs captured in this region included black nose (*C. acronotus*), bull (*C. leucas*), blacktip (*C. limbatus*), nurse (*G. cirratum*) sharpnose (*R. terraenovae*), and great hammerhead (*S. mokarran*) sharks (Table 7).

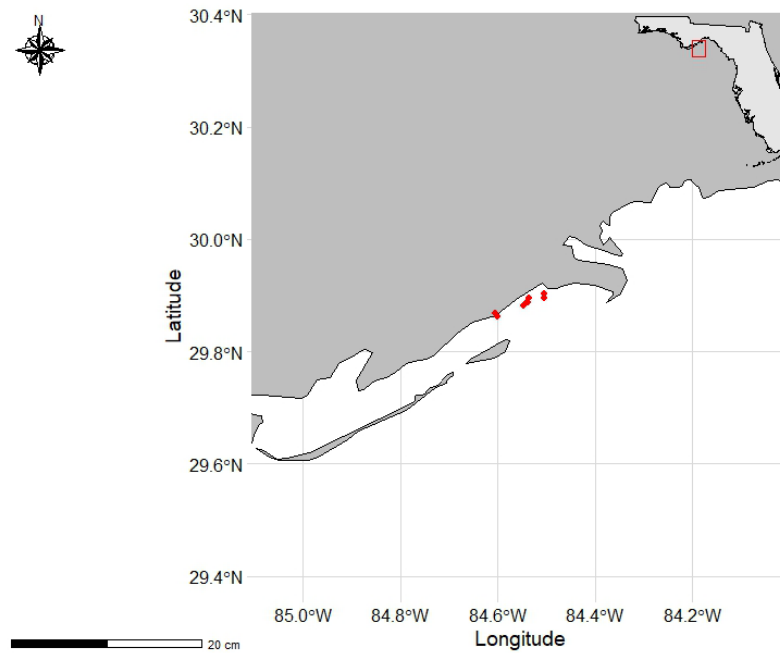


Figure 12. Distribution of bottom longline sets within the Big Bend sub-region of Florida (n=10). Red circles indicate bottom longline sets.

Cape Canaveral

Thirty-two bottom longline sets were made in Cape Canaveral Florida in May (Figure 13). While this area was identified as an important area for smalltooth sawfish migration and movement, no sawfish were captured in this subregion (Graham et al. 2021; Graham et al. 2022). Other elasmobranchs captured in this region included black nose (*C. acronotus*), bull (*C. leucas*), blacktip (*C. limbatus*), sandbar (*C. plumbeus*), nurse (*G. cirattum*), sharpnose (*R. terraenovae*), scalloped hammerhead (*S. lewini*), and great hammerhead (*S. mokarran*) sharks (Table 7).

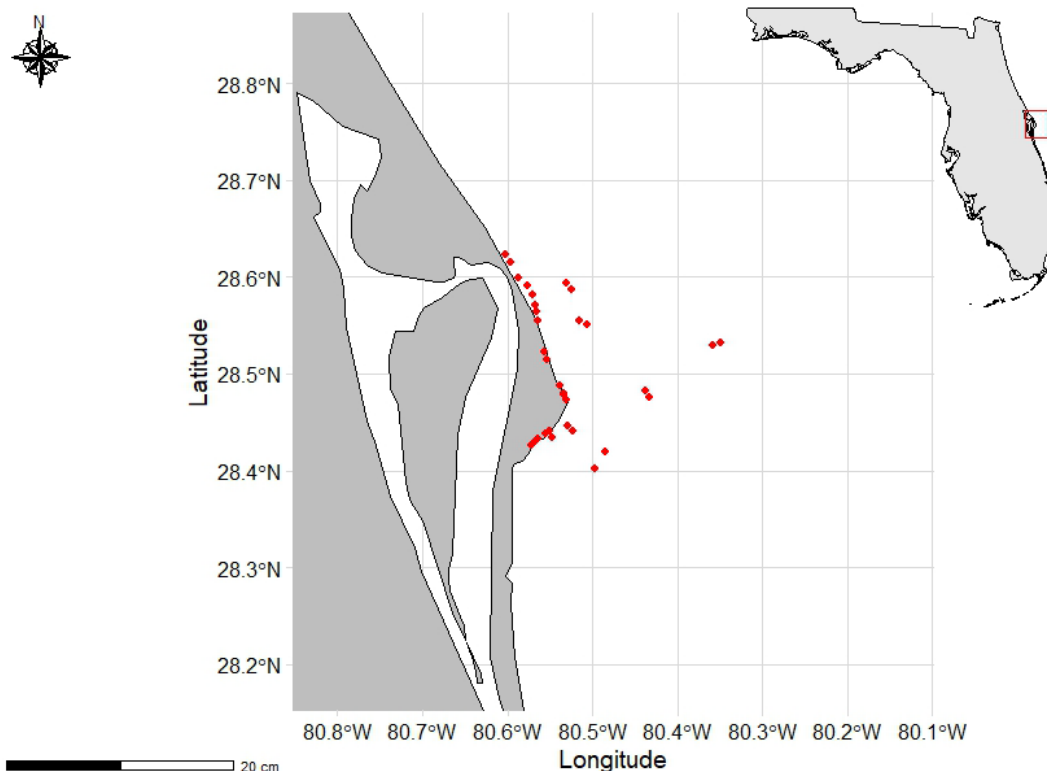


Figure 13. Distribution of bottom longline sets within the Cape Canaveral sub region of Florida (n=32) Red circles

indicate bottom longline sets.

Acoustic and Satellite Telemetry

Twenty-six smalltooth sawfish were internally tagged with acoustic tags in 2025: 11 juveniles (126– 366 cm STL) and 15 mature individuals (372 – 459 cm STL)(Tables 1, 2). All 26 of the smalltooth sawfish acoustically tagged were implemented with 10-year tags. Since internal implementation of acoustic tags began in 2016, a total of 183 sawfish have been tagged throughout the Ten Thousand Islands National Wildlife Refuge, Everglades National Park, and Florida Keys. Of these animals, 49 were YOY (75-149 cm STL), 49 were juvenile (150 – 363 cm STL), 15 were maturing individuals (272 – 364 cm STL), and 84 were mature (322 – 459 cm STL). To date eighteen sawfish have been tagged by collaborators at The Field School (n=4 total) and FWC Charlotte Harbor (n=14 total).

No additional Innovasea (formerly Vemco) VR2W acoustic receivers were deployed this year throughout the Ten Thousand Islands National Wildlife Refuge and Everglades National Park. The total number of VR2W receivers deployed remains at 27 (Figure 13). Due to inclement weather and constraints on staffing and budget greatly reducing the duration of this field season, the acoustic receivers were only serviced (data downloaded and batteries replaced) once, in April. Both NMFS Panama City and FSU are a part of multiple collaborative acoustic tracking networks (e.g., iTAG, FACT, and OTN) expanding the area by which sawfish can be detected (e.g., throughout the Gulf of Mexico, Florida Keys, and up the Atlantic coast). All of the smalltooth sawfish detection data available for this year comes from these collaborative networks. One-hundred and fifty-seven of our one hundred and eighty-three acoustically tagged sawfish (n=11 tagged in 2016, n=25 for 2017, n=6 for 2018, n=13 for 2019, n=5 for 2020, n=32 for 2021, n=35 for 2022, n=7 for 2023, n=19 for 2024, and n =4 for 2025) have been detected on NOAA (n=33 receivers) and on collaborative iTAG and FACT (n > 700 receivers) acoustic receivers throughout the years (2016-current; Figure 15, Figure 16), an 85.8% success of detection. Sawfish detected on collaborating institution receivers ranged from Apalachicola, Florida to Charleston, South Carolina. Our acoustic receivers have detected 23 different species of marine animals ranging from the American alligator (*Alligator mississippiensis*) to the goliath grouper (*Epinephelus itajara*) (Table 7) that have been tagged by state, federal, and university researchers. This highlights the importance of our array and scientific contributions to collaborative acoustic telemetry entities in both the Gulf of Mexico and Atlantic Ocean.

Building on our previous publications (Graham et al. 2021, 2022), analyses are underway using a much larger data set to further assess areas of elevated bycatch risk and those that may be designated as Critical Habitat. Social network analyses of adult sawfish will try and identify potential locations used for mating and detailed habitat use information will be evaluated. Telemetry data for YOY and small juvenile sawfish are being evaluated for changes in habitat use with ontogeny, potentially identifying a general size at which juveniles begin to make migrations. This will inform upon previous knowledge regarding home range and nursery areas and potentially identify any high-use areas previously undocumented.

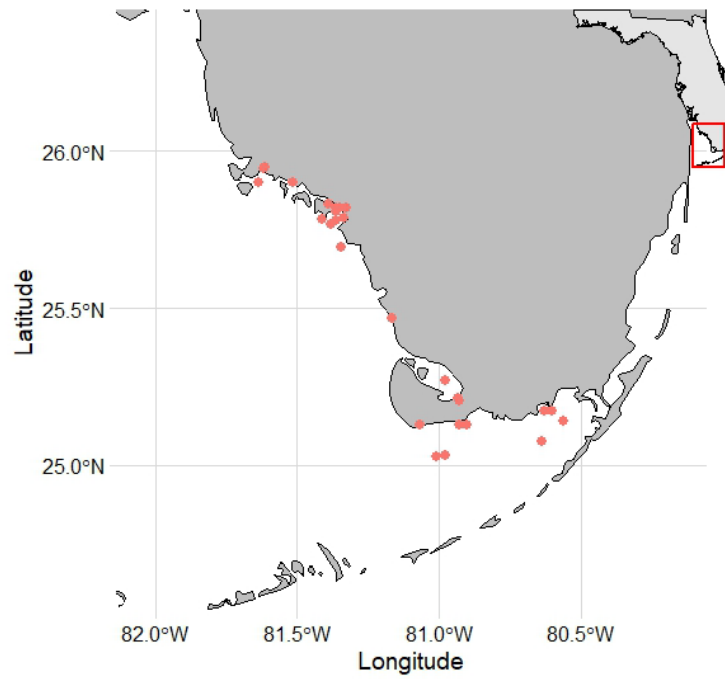


Figure 14. Distribution of NOAA VR2W acoustic receivers throughout Ten Thousand Islands, northern Everglades National Park, and Florida Bay (n=27).

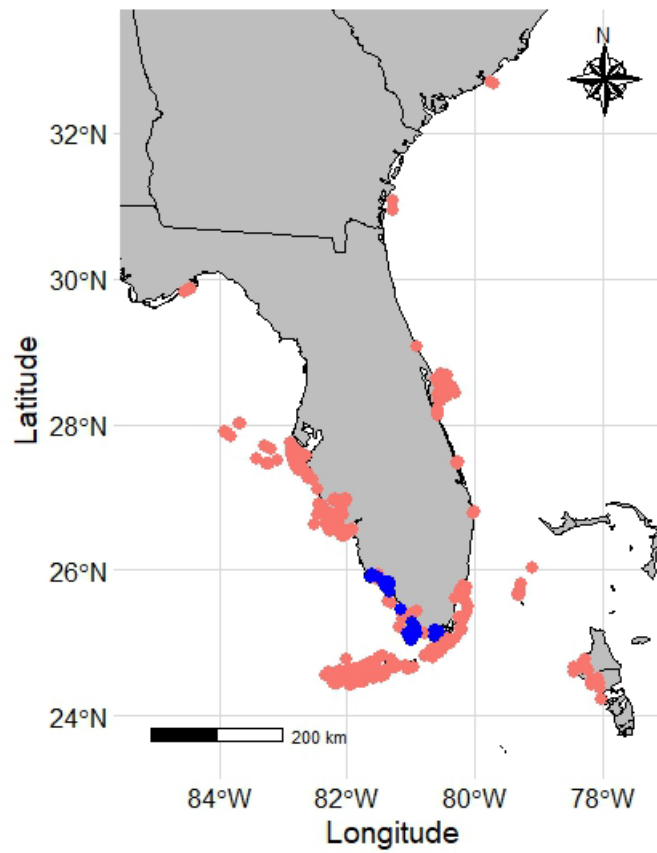


Figure 15. Distribution of Vemco VR2W receivers of NOAA (N=33; blue circles) and of other collaborative institutions (N > 700; red circles; iTAG, FACT, OTN) that acoustically tagged sawfish have been detected on 2016 – present.

Conclusions

Inclement weather coupled with funding and staffing constraints greatly affected the gillnet survey in 2025, which resulted in only one complete sampling trip (i.e., sampling both Florida Bay and NENP). The bottom longline survey sampled more days this field season than in previous years (140 in 2024 v.s 164 in 2025) and expanded their sampling region to include Cape Canaveral Florida which was identified as an important area for sawfish movement and migration (Graham et al. 2021; Graham et al. 2022). A total of 35 sawfish were captured in 2025: 26 of those had a 10-year acoustic tag surgically implanted. Data from collaborative networks (e.g., iTAG, FACT, and OTN) showed 520,963 total detections from 2016 - present on 183 sawfish.

Monitoring of sawfish movements and habitat use via satellite and acoustic telemetry is providing invaluable information on this endangered species. Ongoing research investigating changes in habitat use over ontogeny (i.e., sawfish sized 1.0 m to 2.0 m STL) will be valuable to determine at what size juvenile sawfish move out of their nursery habitat, where they migrate to, and potentially identify additional areas of Critical Habitat. As more smalltooth sawfish are acoustically tagged, monitoring continues, and as more colleagues deploy acoustic receivers in their respective study areas, we expect to see an increase in acoustic detections along the coast of the Gulf of Mexico and up the Atlantic coast, which will provide more detailed information about habitat use and migration patterns across all life stages.

Acknowledgements

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Tables

Table 1. Details for Smalltooth sawfish captures in the 2025 NOAA Fisheries Panama City Laboratory Juvenile Smalltooth Sawfish Monitoring Survey (n=12). Captures are all via gillnet and are listed in chronological order by date of capture. Sub-regions are abbreviated: TTINWR = Ten Thousand Islands National Wildlife Refuge and NENP = Northern Everglades National Park. Area indicates a specific location within the sub-region, latitude and longitude are in decimal degrees, water depth is in meters, lengths are stretched total lengths (STL). All of the tags are 10-year acoustic tags. A (*) within the “Animal Number” column indicates recaptured individuals.

Date	Animal Number	Region	Sub-Region	Latitude (N)	Longitude (W)	Depth (m)	STL (cm)	Sex	Life History Stage	Dart Tag Number	PIT Tag Number	Acoustic Tag Number	Samples	Method
21-Apr-25	001-2025-01-001	TTINWR	Turtle Key	25.885	-81.593	0.7	126	Female	Juvenile	SD01992	982.000.410.287.949	43980	Fin Clip	Gillnet
21-Apr-25	003-2025-01-001	TTINWR	Tripod Key	25.905	-81.621	0.3	170	Female	Juvenile	SS00192	982.000410.281.411	50164	Fin Clip	Gillnet
24-Apr-25	016-2025-01-001	NENP	Chokoloskee Island West	25.828	-81.365	0.5	83	Male	Young of the Year		982.000.410.287.903			Gillnet
24-Apr-25	016-2025-01-002	NENP	Chokoloskee Island West	25.828	-81.365	0.5	81	Male	Young of the Year		982.000.410.288.514		Fin Clip	Gillnet
24-Apr-25	017-2025-01-006*	NENP	Chokoloskee Island West	25.819	-81.360	0.5	137	Male	Juvenile	SS00195	982.000.408.449.471	43978		Gillnet
24-Apr-25	017-2025-01-005	NENP	Chokoloskee Island West	25.819	-81.360	0.5	84.1	Female	Young of the Year		982.000.410.286.348			Gillnet
24-Apr-25	017-2025-01-004	NENP	Chokoloskee Island West	25.819	-81.360	0.5	80	Female	Young of the Year		982.000.408.449.534			Gillnet
24-Apr-25	017-2025-01-003	NENP	Chokoloskee Island West	25.819	-81.360	0.5	163	Female	Juvenile	SS00128	982.000.410.283.127	43979		Gillnet
24-Apr-25	017-2025-01-002	NENP	Chokoloskee Island West	25.819	-81.360	0.5	75	Male	Young of the Year		982.000.410.288.086			Gillnet
24-Apr-25	017-2025-01-001	NENP	Chokoloskee Island West	25.819	-81.360	0.5	84	Male	Young of the Year		982.000.408.449.836			Gillnet
26-Apr-25	018-2025-01-001	NENP	Clubhouse Beach	25.129	-81.039	0.3	83	Male	Young of the Year		982.000.410.285.869			Gillnet
26-Apr-25	021-2025-01-001	NENP	Flamingo Shoreline	25.127	-80.994	0.5	80	Female	Young of the Year		982.000.408.449.374		Fin Clip	Gillnet

Table 2. Details for Smalltooth sawfish captures in the 2025 NOAA Fisheries Panama City Laboratory/ Florida State University juvenile and mature sawfish bottom longline survey (n=22) and captures from our collaborators at the University of Miami (n=1). Note that one animal was lost at the boat in the Florida State University longline survey and thus not included in the table. Sub-regions are abbreviated: SENP= Southern Everglades National Park, FL KEYS = Florida Keys (Inshore/Offshore Florida Keys), and area indicates a specific location within each sub-region. Latitude and longitude are in decimal degrees and lengths are stretched total lengths (STL).). Samples taken are abbreviated: FC = fin clip, B = blood, M= muscle biopsy, C = Cloacal swab. A (*) in the “Animal Number” column denotes recaptured individuals.

Date	Animal Number	Region	Area	Latitude (N)	Longitude (W)	STL (cm)	Sex	Life History Stage	Dart Tag Number	PIT Tag Number	Acoustic Tag Number	Samples	Method
9-Feb-25	PP-25-064	FL Keys	Slough east of Channel 5	24.835	-80.768	403	Male	Mature	P012123	982.000.408.449.004	45549	FC, M, B, C	Longline
9-Feb-25	PP-25-066*	FL Keys	Slough east of Channel 5	24.835	-80.768	383	Female	Mature	P012108	982.000.364.937.722	45548	FC, M, B, C	Longline
9-Apr-25	PP-25-073	FL Keys	7 Mile Bridge - Marathon	24.700	-81.134	376	Male	Mature	P011722	982.000.408.449.077	43601	FC, M, B, C	Longline
12-Apr-25	PP-25-106	SENP	Middleground	25.113	-81.043	361	Male	Juvenile	P011951	982.000.408.449.007	45546	FC, M, B, C	Longline
12-Apr-25	PP-25-107	SENP	Middleground	24.113	-81.043	366	Male	Juvenile	P011971	982.000.410.281.275	45547	FC, M, B, C	Longline
12-Apr-25	PP-25-108	SENP	Middleground	24.113	-81.043	366	Male	Juvenile	P011959	982.000.408.449.855	43596	FC, M, B, C	Longline
12-Apr-25	PP-25-109	SENP	Middleground	24.113	-81.043	322	Female	Juvenile	P011961	982.000.410.285.996	43599	FC, M, B, C	Longline
12-Apr-25	PP-25-111	SENP	Joe Kemp/Snake Bight	25.130	-80.901	421	Male	Mature	P011956	982.000.408.449.819	43094	FC, M, B, C	Longline
13-Apr-25	PP-25-113	SENP	Middleground	25.111	-81.052	312	Male	Juvenile	P011262	982.000.410.280.686	43592	FC, M, B, C	Longline
13-Apr-25	PP-25-114	SENP	Middleground	25.111	-81.052	360	Female	Juvenile	P011267	982.000.408.449.441	43097	FC, M, B, C	Longline
13-Apr-25	PP-25-116*	SENP	Middleground	25.113	-81.042	321	Male	Juvenile	P011271	989.001.006.698.131	43095	FC, M, B, C	Longline
13-Apr-25	PP-25-120	SENP	Conchie Channel	25.099	-80.967	402	Male	Mature	P011255	982.000.410.286.339	43092	FC, M, B, C	Longline
17-Nov-25	PP-25-216	FL Keys	Queen of Nassau Wreck	24.787	-80.660	420	Female	Mature	P011708	982.000.408.449.601	43096	FC, M, B, C	Longline
17-Nov-25	PP-25-217	FL Keys	Queen of Nassau Wreck	24.787	-80.660	401	Female	Mature	P011257	982.000.408.448.893	43098	FC, M, B, C	Longline
19-Nov-25	PP-25-242	SENP	Joe Kemp/Snake Bight	25.131	-80.900	399	Male	Mature	P011778	982.000.408.449.063	43091	FC, M, B, C	Longline

Date	Animal Number	Region	Area	Latitude (N)	Longitude (W)	STL (cm)	Sex	Life History Stage	Dart Tag Number	PIT Tag Number	Acoustic Tag Number	Samples	Method
19-Nov-25	PP-25-243	SENP	Joe Kemp/Snake Bight	25.131	-80.900	390	Male	Mature	P011784	982.000.410.283.193	43099	FC, M, B, C	Longline
20-Nov-25	PP-25-247	SENP	Middleground	25.109	-81.042	372	Male	Mature	P011785	-	43093	FC, M, B, C	Longline
20-Nov-25	PP-25-248	SENP	Middleground	25.109	-81.042	392	Male	Mature	P011782	-	43597	FC, M, B, C	Longline
21-Nov-25	PP-25-258*	FL Keys	7 Mile Bridge - Marathon	24.700	-81.134	414	Male	Mature	P011797	982.000.180.967.379	46573	FC, M, B, C	Longline
21-Nov-25	PP-25-262	FL Keys	7 Mile Bridge - Marathon	24.700	-81.134	378	Male	Mature	P011787	989.001.031.453.001	46570	FC, M, B, C	Longline
21-Nov-25	PP-25-263	FL Keys	7 Mile Bridge - Marathon	24.700	-81.134	459	Female	Mature	P011779	989.001.031.453.071	46531	FC, M, B, C	Longline
21-Nov-25	PP-25-264*	FL Keys	7 Mile Bridge - Marathon	24.700	-81.134	377	Male	Mature	P011792	985.121.022.566.128	42852	FC, M, B, C	Longline
28-Jun-25	Pankow_1_2 5	Biscayne Bay	Key Biscayne	25.664	-80.149	406	Male	Mature	427557	3D6.ID599OB374	-		Drumline

Table 3. Details for Smalltooth sawfish recaptures for 2025. Recaptures are listed in chronological order by recapture dates. Sub-regions are defined as ENP = Everglades National Park and TTINWR = Ten Thousand Islands National Wildlife Refuge, FL KEYS = Florida Keys (Inshore/Offshore Florida Keys). Area indicates a specific location within the sub-region. Latitude and longitude are in decimal degrees, Lengths are stretched total length, STL, and Maturity states are YOY = young-of-the-year, JUV = juvenile. A (†) denotes a Smalltooth sawfish originally tagged by FWC, a (‡) denotes a sawfish originally tagged by NOAA.

Animal #	Sex	Date	Event	Sub-Region	Area	Latitude (N)	Longitude (W)	STL (cm)	Maturity State	Dart Tag No.	PIT Tag No.	Acoustic Tag No.
PP-25-066	F	7/24/2018	Capture‡	TTINWR	Faka Union Bay	25.899	-81.517	125	YOY	D13120	982.000.364.937.722	--
		2/9/2025	Recapture	FL Keys	Slough east of Channel 5	24.835	-80.768	383	MAT	P012108	982.000.364.937.722	45548
PP-25-116	M	8/24/2018	Capture†	--	Caloosahatchee	--	--	122.3	YOY	--	989.001.006.698.131	--
		4/13/2025	Recapture	SENP	Middleground	25.113	-81.042	321	JUV	P011271	989.001.006.698.131	43095
017-2025-01-006	M	7/27/2024	Capture‡	NENP	Chokoloskee Bay	25.828	-81.364	101	YOY	SD01072	982.000.408.449.471	--
		4/24/2025	Recapture	NENP	Chokoloskee Island West	25.819	-81.360	137	JUV	SS00195	982.000.408.449.471	43978
PP-25-258	M	2/6/2013	Capture‡	NENP	Turner River	25.831	-81.338	83	YOY	T0286	982.000.180.967.379	--
		11/21/2025	Recapture	FL Keys	7 Mile Bridge	24.700	-81.134	414	MAT	P011797	982.000.180.967.379	46573
PP-25-264	M	3/17/2014	Capture†	--	Matlacha Pass	--	--	128.9	--	--	985.121.022.566.128	--
		11/21/2025	Recapture	FL Keys	7 Mile Bridge	24.700	-81.134	377	MAT	P011792	985.121.022.566.128	42852

Table 4. A summary of the CPUE (number of sawfish per soak hour) for the gillnet survey and CPUE (number of sawfish/hooks) for the bottom longline survey. Young-of-the-year = YOY, TTINWR = Ten Thousand Islands National Wildlife Refuge, NENP = Northern Everglades National Park, WWCB = Whitewater and Coot Bays, FLBAY = Florida Bay, SENP = Southern Everglades National Park including Florida Bay, FL KEYS = Florida Keys (Inshore/Offshore Florida Keys). Sexes are combined for both surveys and the juvenile and mature sawfish are combined for the bottom longline survey.

Life History Stage		FLBAY	NENP	TTINWR	WWCB	
Gillnet	Neonate	0.00	0.00	0.00	0.00	
	YOY	0.00	1.22	0.00	0.00	
	Juvenile	0.00	0.30	0.36	0.00	
	Adult	0.00	0.00	0.00	0.00	
		Big Bend	Cape Canaveral	FL Keys	SENP	Tampa
Bottom Longline	Juvenile & Mature	0.000	0.00000	0.00367	0.00848	0.00000

Table 5. List of elasmobranch species that were incidental catches in gillnet sets. Species and the number captured are listed for each sub-region. Abbreviations are TTINWR = Ten Thousand Islands National Wildlife Refuge, NENP = Northern Everglades National Park, WWCB = Whitewater and Coot Bays, FLBAY = Florida Bay.

Species	TTINWR	FLBAY	WWCB	NENP	Total
<i>Carcharhinus isodon</i>	1	0	0	0	1
<i>Carcharhinus leucas</i>	0	1	3	0	4
<i>Negaprion brevirostris</i>	3	4	0	0	7
<i>Sphyrna tiburo</i>	2	0	0	0	2
Total	6	5	3	0	14

Table 6. List of teleost species that were incidental catches in gillnet sets. Species and the number captured are listed for all sub-regions combined (Ten Thousand Islands National Wildlife Refuge, Northern Everglades National Park, Whitewater and Coot Bays, Florida Bay).

Species	Total
<i>Archosargus probatocephalus</i>	1
<i>Arius felis</i>	1
<i>Bagre marinus</i>	1
<i>Chaetodipterus faber</i>	1
<i>Megalops atlanticus</i>	1

Species	Total
<i>Pogonias cromis</i>	1
<i>Caranx hippos</i>	2
<i>Sciaenops ocellatus</i>	2
<i>Centropomus undecimalis</i>	3
<i>Trachinotus carolinus</i>	3
<i>Gerres cinereus</i>	5
<i>Trachinotus falcatus</i>	10
Total	31

Table 7. List of elasmobranch species that were incidental catches in bottom longline sets. SENP = Southern Everglades National Park including Florida Bay. FL KEYS = Florida Keys (Inshore/Offshore Florida Keys).

Species	Big Bend	Cape Canaveral	FL Keys	SENP	Tampa	Total
<i>Carcharhinus acronotus</i>	3	43	15	34	23	118
<i>Carcharhinus brevipinna</i>	0	4	0	0	1	5
<i>Carcharhinus falciformis</i>	0	0	0	0	0	0
<i>Carcharhinus isodon</i>	0	0	0	0	0	0
<i>Carcharhinus leucas</i>	1	1	0	30	1	33
<i>Carcharhinus limbatus</i>	15	8	12	96	8	139
<i>Carcharhinus perezi</i>	0	0	0	0	0	0
<i>Carcharhinus plumbeus</i>	0	2	0	0	0	2
<i>Dasyatis americana</i>	0	0	0	2	0	2
<i>Ginglymostoma cirratum</i>	1	1	88	8	28	126
<i>Galeocerdo cuvier</i>	0	0	7	1	0	8
<i>Negaprion brevirostros</i>	0	0	0	10	1	11
<i>Rhizoprionodon terraenovae</i>	25	73	16	0	6	120
<i>Sphyrna lewini</i>	0	19	1	0	0	20
<i>Sphyrna mokarran</i>	6	2	19	3	16	46
<i>Sphyrna tiburo</i>	0	0	2	0	1	3
Total	51	153	160	184	85	633

Table 8. List of species tagged by state, federal, and university researchers that have been detected on the NOAA acoustic telemetry array since its establishment in 2017 (n=23).

Species	Common Name
<i>Carcharhinus acronotus</i>	Blacknose shark
<i>Carcharhinus leucas</i>	Bull shark
<i>Carcharhinus limbatus</i>	Blacktip shark
<i>Galeocerdo cuvier</i>	Tiger shark
<i>Negaprion brevirostris</i>	Lemon shark
<i>Sphyrna tiburo</i>	Bonnethead shark
<i>Aetobatus narinari</i>	Spotted eagle ray
<i>Hypanus americanus</i>	Southern stingray
<i>Megalops atlanticus</i>	Atlantic tarpon
<i>Arius felis</i>	Hardhead Catfish
<i>Epinephelus itajara</i>	Goliath grouper
<i>Caranx hippos</i>	Crevalle jack
<i>Centropomus undecimalis</i>	Common snook
<i>Albula vulpes</i>	Bonefish
<i>Lutjanus griseus</i>	Grey snapper
<i>Trachinotus falcatus</i>	Permit
<i>Sciaenops ocellatus</i>	Red drum
<i>Micropterus salmoides</i>	Florida largemouth bass
<i>Archosargus probatocephalus</i>	Sheepshead
<i>Menticirrhus americanus</i>	Southern kingfish
<i>Lobotes surinamensis</i>	Atlantic tripletail
<i>Cynoscion nebulosus</i>	Spotted sea trout
<i>Alligator mississippiensis</i>	American alligator

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