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Appendix A

SEFSC Research Gear and Vessel Descriptions

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Table A-1 Output characteristics for SEFSC active acoustic sources A-22

1 Trawl Nets

A trawl is a funnel-shaped net towed behind a boat to capture fish. The cod end, or 'bag,' is the fine-meshed portion of the net most distant from the towing vessel where fish and other organisms larger than the mesh size are retained. In contrast to commercial fishery operations, which generally use larger mesh to capture market-sized fish, research trawls often use smaller mesh to enable estimates of the size and age distributions of fish stocks in a particular area. The body of a trawl net is generally constructed of relatively coarse mesh that functions to gather schooling fish so that they can be collected in the cod end. The opening of the net, called the 'mouth', is extended horizontally by large panels of wide mesh called 'wings.' The mouth of the net is held open (horizontally and vertically) by the hydrodynamic force exerted on the trawl doors attached to the wings of the net, floats placed on the headrope, and the net itself as the vessel moves forward.

The trawl net is usually deployed over the stern of the vessel, and attached with two cables, or 'warps,' to winches on the deck of the vessel. The cables are played out until the net reaches the fishing depth. The duration of the tow depends on the purpose of the trawl, the catch rate, and the target species. At the end of the tow, the net is retrieved, and the contents of the cod end are emptied onto the deck or sorting table. For research purposes, the speed and duration of the tow and the characteristics of the net must be standardized to allow for meaningful comparisons of data collected at different times and locations. Active acoustic devices incorporated into some research vessels and trawl gear may be used to monitor the position and status of the net, speed of the tow, and other variables important to the research design.

SEFSC research trawling activities use both 'pelagic' (surface or mid-water) trawls, which are designed to operate at various depths within the water column, as well as 'bottom' trawls, which are designed to capture target species at or near the seafloor. Bottom trawls may have sweeps to collect marine animals as they lay on the bottom or gather before the trawl opening. The trawl gear may be constructed and rigged for various target species and to operate over different types of bottom surfaces.

Aleutian Wing Trawl

The SEFSC uses an Aleutian Wing Trawl to sample mid-water prey (500-800 m) of marine mammals in the Gulf of Mexico and Atlantic Research Areas. Aleutian Wing Trawls are high speed mid-water trawls and they tend to be larger than bottom trawls with ropes that herd the shoals of fish towards the main body of the trawl (Figure A-1). The Aleutian Wing Trawl used by the SEFSC has a 10-meter (m) wide mouth opening and 2 x 3 m doors and is towed for 1-3 hours at target depth.

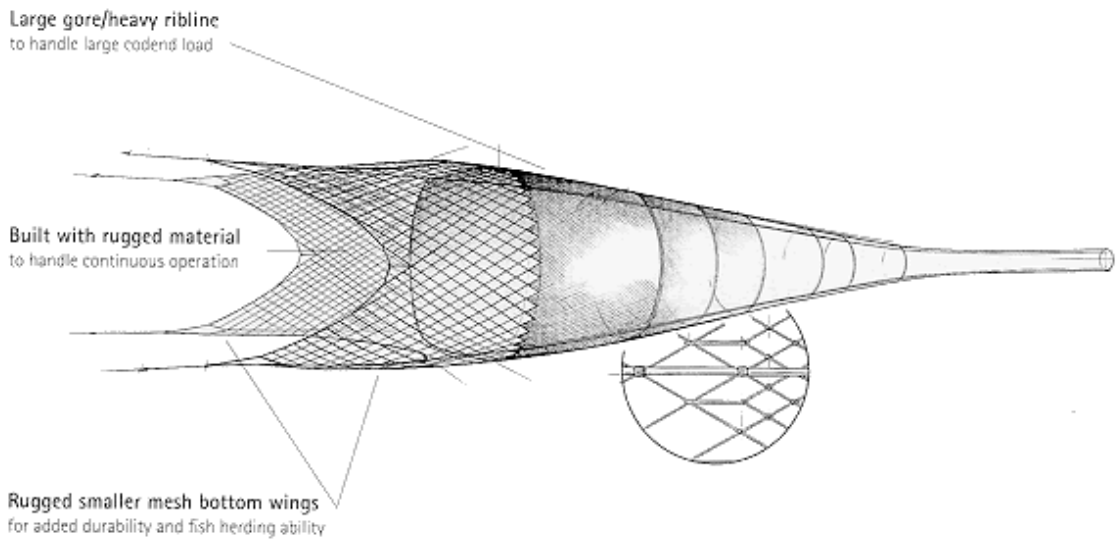

Figure A-1. Aleutian wing trawl illustration

Otter Trawl

The otter trawl with various modifications, is the dominant gear used in SEFSC surveys. A basic otter trawl consists of a heavy mesh bag with wings on each side designed to funnel shrimp and fish into the cod end. A pair of otter boards or trawl doors positioned at the end of each wing hold the mouth of the net open by exerting a hydrodynamic downward and outward force at towing speed.

An otter trawl is a cone-shaped net consisting of a body (made from two, four, and sometimes more panels) and narrowing to one or two cod ends. Lateral mesh wings extend forward from the opening and lead to two otter boards which force the wings open by the hydrodynamic force imposed when the vessel moves forward. A boat can be rigged to tow a single or two parallel trawls from the stern or from the side on outriggers. Otter trawls usually have an extended top panel (square) to prevent fish from escaping upwards over the top of the net. The mouth of the trawl is framed by a headrope (also called a headline) with floats to open the trawl vertically and the footrope with rollers or other groundgear designed for particular sea floor conditions to maximize the capture of target species living close to the bottom and minimize damage to the gear while moving across uneven surfaces (Figures A-2 and A-3).

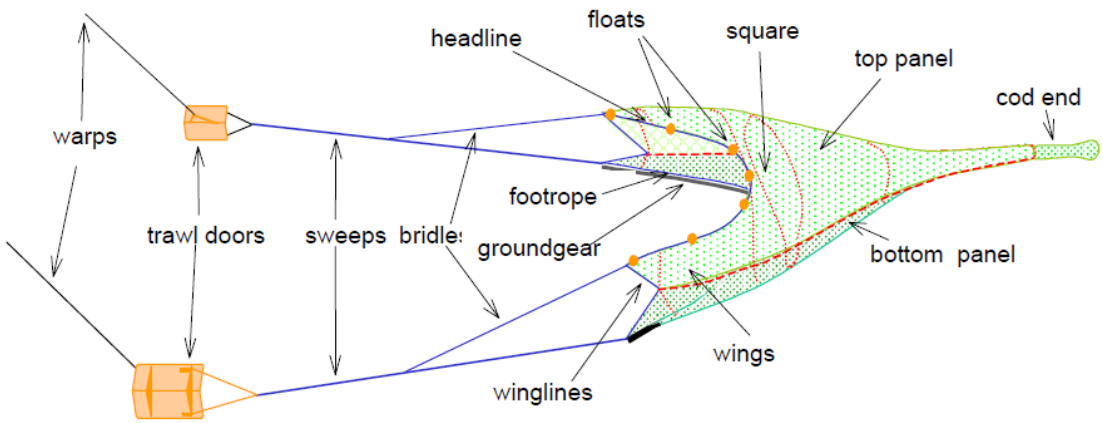

Figure A-2. Otter bottom trawl illustration

Figure A-3. Otter trawl being hauled onboard

Semi-balloon Shrimp Trawl

The semi-balloon shrimp trawl is a modified version of an otter trawl (Figure A-4). The semi-balloon shrimp trawl used by the SEFSC consists of a 20 ft trawl net (1 ½ in stretch mesh), with 30 in wooden otter trawl doors and a tickler chain. It is used in estuaries of the Georgia Sound system that includes the Ossabaw, Altamaha, and St. Andrew rivers to develop indices for recreationally important crustaceans and finfish.

Figure A-4. Semi-balloon shrimp trawl being deployed

Western Jib Shrimp Trawl

The western jib shrimp trawl is another variation of an otter trawl and is used by the SEFSC for gear testing of various Turtle Excluder Devices (TEDs). The western jib shrimp trawl is 50 feet in length with 8 foot by 40 inch wooden doors.

Mongoose-type Falcon Bottom Trawls

The mongoose trawl is a variation of the otter trawl (Figure A-2). The mongoose design incorporates a triangular tongue of additional webbing attached to the middle of the headrope pulled by a center towing cable, in addition to the two cables pulling the doors. This configuration allows the net to spread wider and higher than the conventional otter trawl. The paired (towed by two vessels) mongoose-type Falcon bottom trawl (manufactured by Beaufort Marine Supply) is used during the SEAMAP-SA North Carolina Pamlico Sound Trawl Survey to monitor juvenile fish, shrimp, and crab abundance. This trawl is 120 ft wide with a three-lead bride, 34 ft footrope, 0.1875-inch tickler chain, and 4 x 2 ft wooden doors. A pair of 75-ft mongoose-type Falcon trawl nets are also employed by the SEAMAP-SA Coastal Trawl Survey, but the paired trawl is accomplished by towing the two nets on outriggers on either side of the same vessel. This trawl has a three-lead bridle, 89-ft foot-rope, 0.25-inch tickler chain, and 10 ft x 40 inch wooden chain doors.

Skimmer Shrimp Trawl

A skimmer trawl (Figure A-5) extends from the outrigger of a vessel with a cable and a lead weight which hold the trawl mouth open (instead of floats and chains). Skimmers are only used in shallow waters because of the way they are constructed.

The skimmer trawl is held in place by the frame on three sides and mounted on the vessel just behind the bow. Skimmer trawls are pushed through the water instead of towed behind the vessel like otter trawls. The frame is rigid enough to keep the net on the bottom but flexible enough to glide over obstacles along the bottom. This allows the skimmer vessel to continue to move while the cod end of the trawl is retrieved and emptied. This may be done as often as every 30 minutes. The skimmer trawl illustrated below includes a TED and Bycatch Reduction Device (BRD).

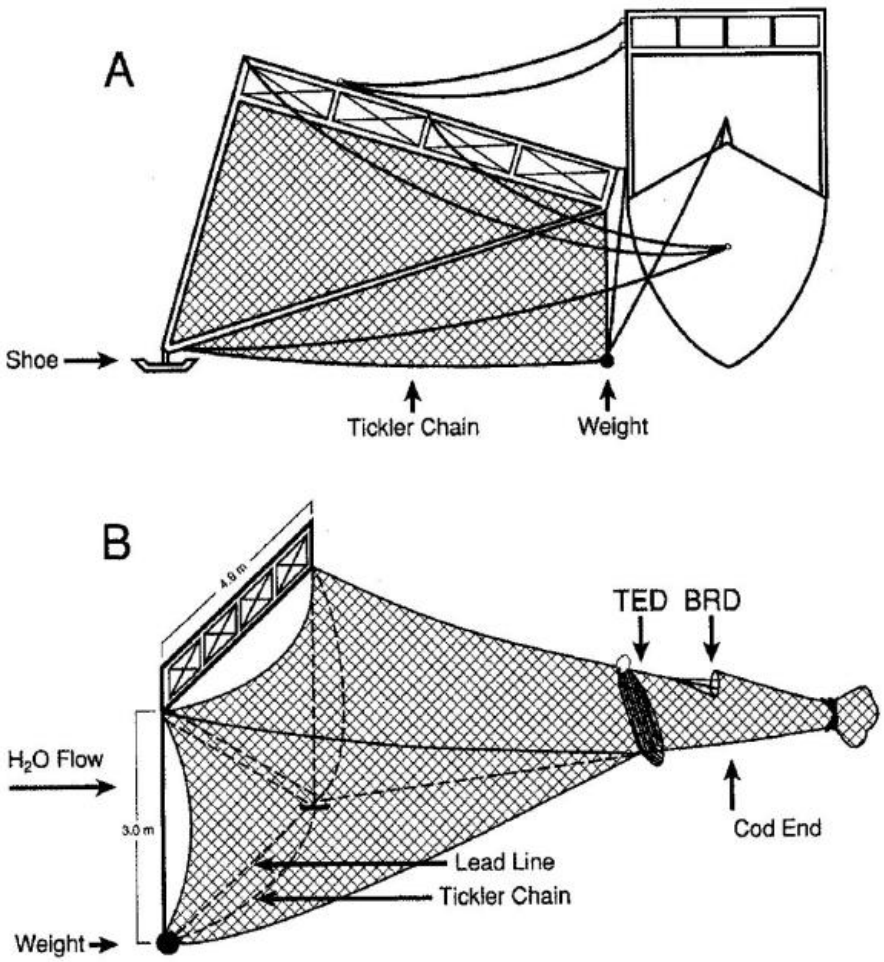

Figure A-5. Skimmer trawl schematic

Miniature Roller Frame Trawl

The roller frame trawl (Figure A-6) has a rectangular rigid frame, usually metal, to keep the mouth of the net open. The interior of the frame contains a grid of vertical bars shielding the net opening, while the bottom of the frame has rollers which allow the apparatus to roll over the seabed. The beam length of the frame is not more than 16 feet and the vertical bars in the frame are no more than 3 inches apart. The SEFSC uses a miniature roller frame trawl with a 0.5 m diameter mouth and 1 mm mesh to collect pink shrimp for comparison of survival and growth.

Figure A-6. Roller frame trawl

Modified Beam Trawl

A beam trawl (Figures A-7 and A-8) is a type of bottom trawl that uses a wood or metal beam to hold the net open as it is towed along the sea floor. The beam holds open the mouth of the net so that no trawl doors are needed. Beam trawls are generally smaller than other types of bottom trawls. Commercial beam trawls have beams of up to 12 meters, while beam trawls for research purposes typically use beams of two to four meters. The beam trawl used by the SEFSC for post-larval, juvenile fish, and invertebrate surveys is a modified version that is constructed with a beam of 1.5 meters and could be pulled by hand.

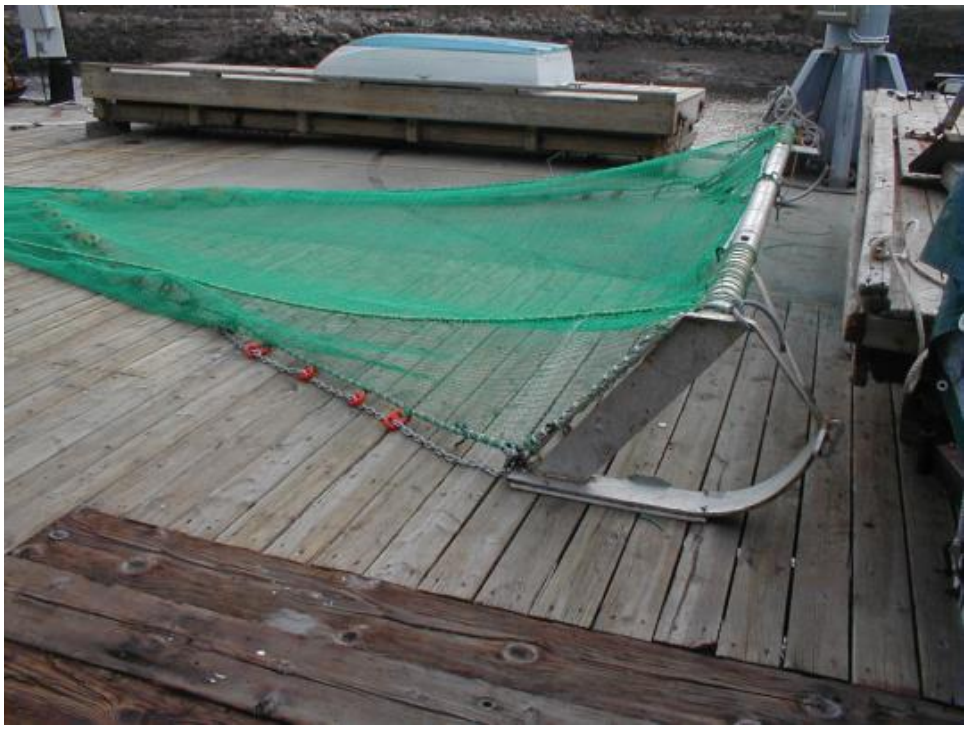

Figure A-7. Beam trawl on deck

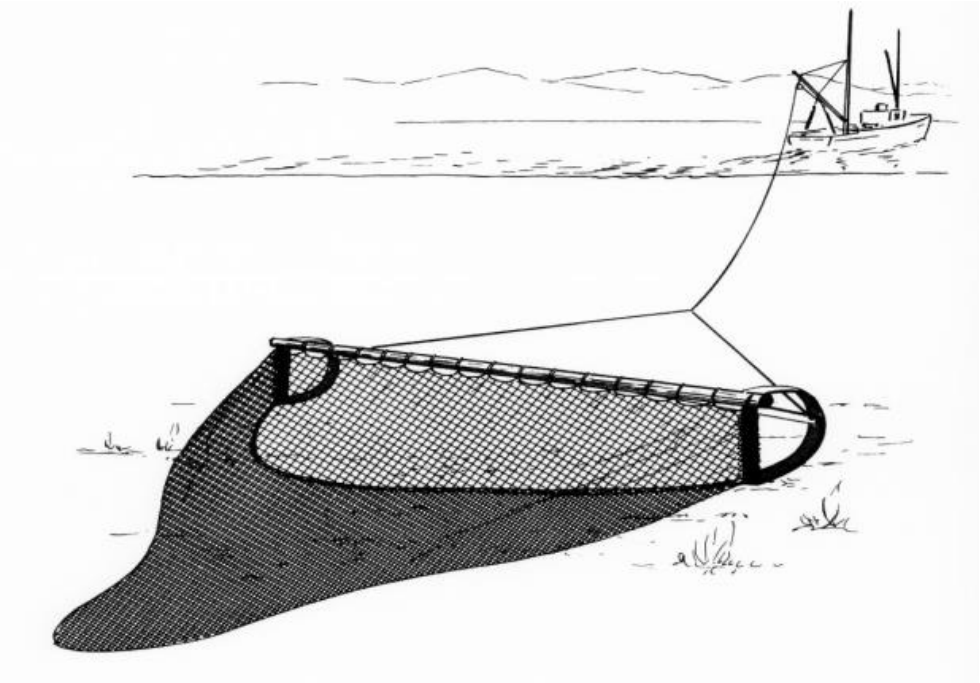

Figure A-8. Beam trawl illustration

2 Oyster Dredge

Oyster dredges (Figure A-9) are constructed from a metal frame with metal chain netting. Along the front edge of the dredge is a long bar with teeth that are dragged on the seafloor to pick up oysters and deposit them into the chain mesh netting. The oyster dredge used for the Mississippi Department of Marine Resource Oyster surveys consists of a nine-tooth bar about 20 inches wide with teeth 4 inches long and spaced 2 inches apart.

Figure A-9. Oyster dredge

3 Hook-and-Line Gear

A variety of SEFSC surveys use hook-and-line gears to sample fish either in the water column or in benthic environments. These gear types include baited hooks deployed on longlines as well as rod-and-reel and bandit gear deployments.

Longline vessels fish with baited hooks attached to a mainline or 'groundline'. The length of the longline and the number of hooks depend on the species targeted, the size of the vessel, and the purpose of the research. Hooks are attached to the mainline by another thinner monofilament line called a 'gangion'. The length of the gangion and the distance between gangions depends on the purpose of the research. The longlines used by the SEFSC for research typically have 100 gangions, each with one baited hook.

Pelagic Longline

Buoys are used to keep pelagic longline gear suspended near the surface of the water, and flag buoys (or 'high flyers') equipped with radar reflectors, radio transmitters, and/or flashing lights are attached to each end of the mainline to enable the crew to find the line for retrieval (Figure A-10). Target species for pelagic longline surveys conducted by the SEFSC are pelagic sharks and finfish species. These pelagic

longline protocols have a five-nautical mile mainline with 100 gangions. The time period between completing deployment and starting retrieval of the longline gear is the 'soak time.' Soak time is an important parameter for calculating fishing effort and is typically three hours for SEFSC surveys. Short soak times can help reduce longline interactions with sea turtles and marine mammals.

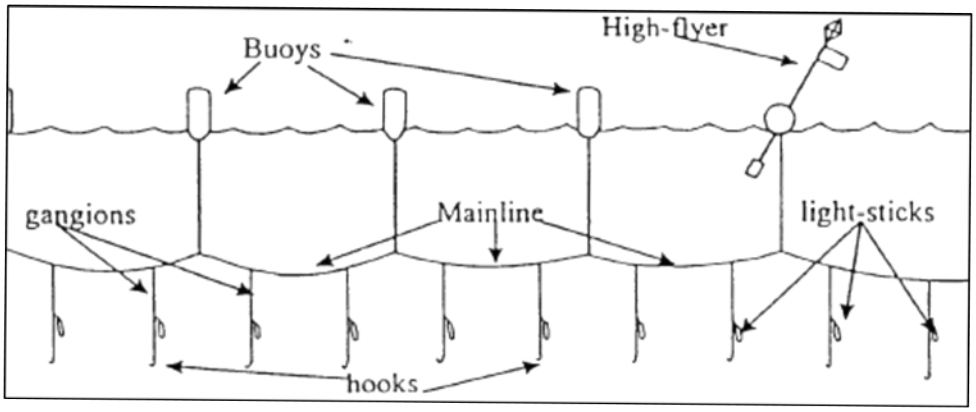

Figure A-10. Pelagic longline schematic

Bottom Longline

Bottom longlines used by the SEFSC to survey species in deeper water, including sablefish, have a one-mile long monofilament mainline that is anchored on the seafloor with weights at the mid-point and ends. The line is marked at the surface by radar high flyers (Figure A-11).

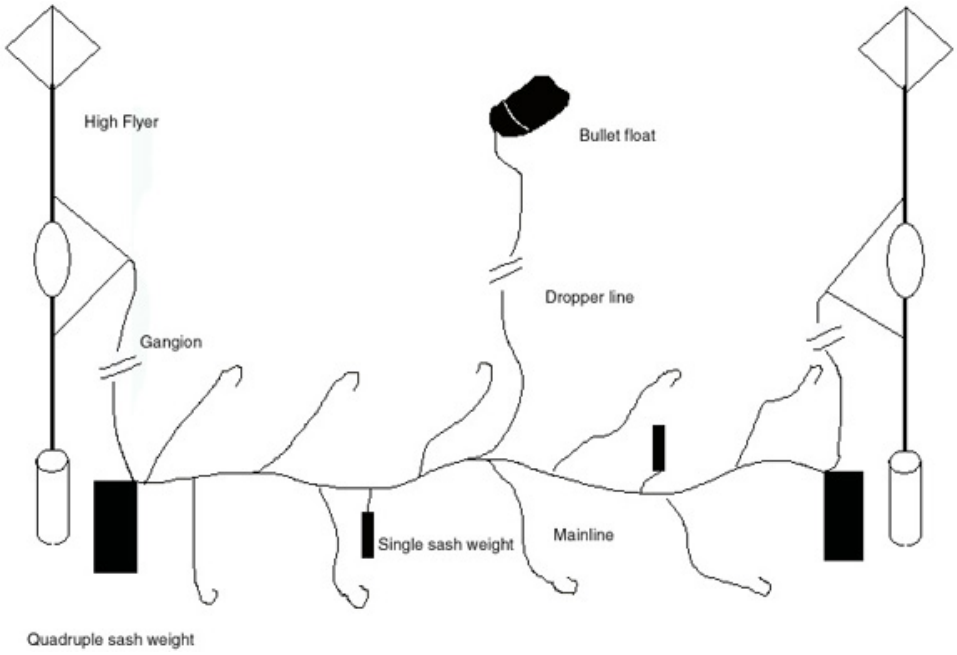

Figure A-11. Bottom longline schematic

Rod and Reel

This gear is a standard fishing pole with a reel attached near the base. These are used by the SEFSC to sample fish in the nearshore reef inlet and estuary of the St. Lucie River, FL.

Bandit Reels

Bandit reels are heavy duty fishing reels that are used for deep sea fishing (Figure A-12). The SEFSC uses a bandit reel with a vertical mainline and 10 gangions that is either deployed from the vessel and marked at the surface by a buoy or is fished while maintaining an attachment to the reel. The hook sizes used are 8/0, 11/0, or 15/0 circle hooks with 0 offset.

Figure A-12. Bandit reel

4 Plankton Nets

SEFSC research activities include the use of several plankton sampling nets that employ very small mesh to sample plankton from various parts of the water column. Plankton sampling nets usually consist of fine mesh attached to a weighted frame. The frame spreads the mouth of the net to cover a known surface area.

Bongo Nets

Bongo nets are used by the SEFSC during various plankton surveys conducted throughout the three research areas. Bongo nets are also used to collect additional data during shark and finfish surveys. Bongo nets consist of two cylindrical nets that come in various diameters and fine mesh sizes (Figure A-13). The bongo nets are towed through the water at an oblique angle to sample plankton over a range of depths. During each plankton tow, the bongo nets are deployed to a depth of approximately 210 m and are then retrieved at a controlled rate so that the volume of water sampled is uniform across the range of depths. In

shallow areas, the sampling protocol is adjusted to prevent contact between the bongo nets and the seafloor. A collecting bucket, attached to the end of the net, is used to contain the plankton sample. When the net is retrieved, the collecting bucket can be detached and easily transported to a laboratory. Some bongo nets can be opened and closed using remote control to enable the collection of samples from particular depth ranges. A group of depth-specific bongo net samples can be used to establish the vertical distribution of zooplankton species in the water column at a site. Bongo nets are generally used to collect zooplankton for research purposes and are not used for commercial harvest.

Figure A-13. Bongo net

Neuston Nets

Neuston nets are used to collect zooplankton that lives in the top few centimeters of the sea surface (the neuston layer). This specialized net has a rectangular mouth opening (usually 2 or 3 times as wide as deep, i.e. 60 cm by 20 cm). They are generally towed half submerged at 1-2 knots from the side of the vessel on a boom to avoid the ship's wake.

Figure A-14. Neuston net

Methot Juvenile Fish Net

A Methot net is used to sample juvenile fish, shrimp, and other larger plankton (4 millimeters and larger). It is a single net with a large square opening and is towed behind the vessel. A flowmeter suspended in the mouth of the net measures the flow of water moving through the net and allows for calculation of the volume of water sampled.

MOCNESS

The Multiple Opening/Closing Net and Environmental Sensing System (MOCNESS) uses a stepping motor to sequentially control the opening and closing of individual nets to obtain discrete depth tow data (Figure A-15). The MOCNESS uses underwater and shipboard electronics for controlling the device. The electronics system continuously monitors the functioning of the nets, frame angle, horizontal velocity, vertical velocity, volume filtered, and selected environmental parameters such as salinity and temperature. The SEFSC uses the MOCNESS to develop larval indices for snapper, parrot fish, and grouper, as well as to determine seasonal abundances, and population connections between islands and upstream sources.

Figure A-15. MOCNESS

5 Other Nets

Bag Seine

A bag seine is a seine net operated from the shore (Figure A-16). The gear is composed of a bunt (bag or lose netting) and long wings often lengthened with long ropes for towing the seine to the beach. The headrope of the net stays at the surface of the water with float attachments and the footrope maintains contact with the bottom, creating an effective barrier for fish. The SEFSC uses bag seines with a central cod end to survey shrimp, shellfish and estuary fish populations.

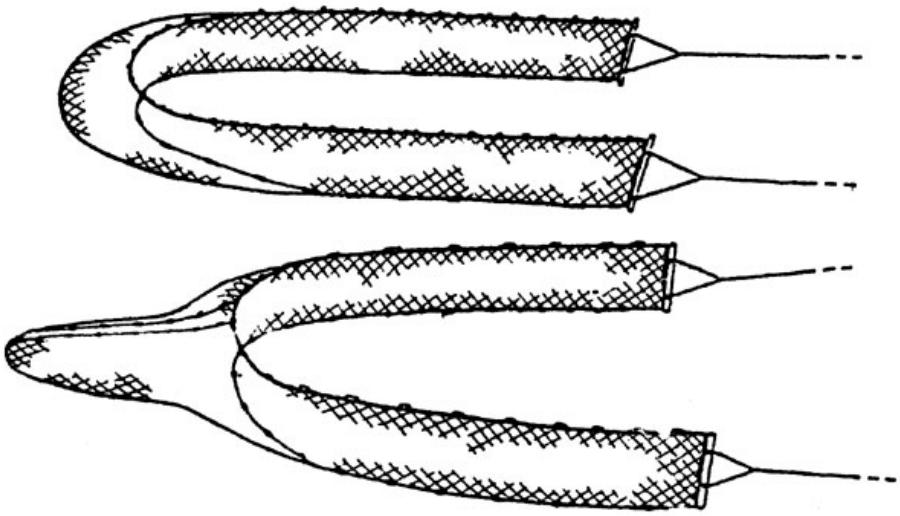

Figure A-16. Bag seine illustration with and without a central cod end

Set Gillnets

Set gillnets (Figure A-17) consist of vertical netting held in place, either near the surface or lower in the water column, by floats and weights to selectively target fish of a particular size range depending on the netting size (Walden 1996). Typical gillnets are made of monofilament, multi-monofilament, or multifilament nylon constructed of paneling of varying mesh sizes depending on their use and target species (Hovgård and Lassen 2000). The SEFSC uses gillnets of various sizes, ranging from 1 to 5½ inches stretched mesh, and total net lengths from 100 to 750 feet. Gillnets are used in finfish, smalltooth sawfish, and juvenile shark population surveys in the Gulf of Mexico and Atlantic.

Two SEFSC surveys have shallow water deployments in depths from 0.2 to 2 m. A single 750 ft long x 6 ft deep gillnet consisting of five 150 ft panels, each with stretch-mesh sizes 2, 2½, 3, 3 ½, and 4 inches, respectively, is used for the IJA Coastal Finfish Gillnet Survey. The Smalltooth Sawfish Abundance Survey uses gillnets that are 5 ft deep and either 100 or 200 ft long with mesh sizes either 3 or 4 inches, fished in depths of 0.2 to 1.0 m. Nets are anchored at both ends, and marked with surface buoys; only one net is fished at a time.

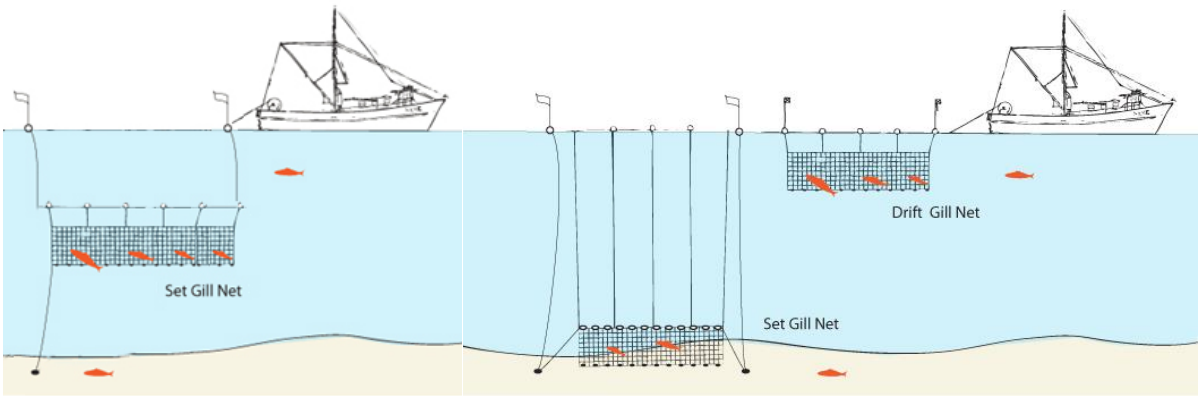

Figure A-17. Diagram of different gillnet deployments

Midwater Set Gillnet

All research institutions participating in the GULFSPAN survey use a midwater monofilament set gillnet consisting of six different stretched-mesh size panels for sampling in all areas. Stretched-mesh sizes range from 3 inches to 5½ inches in ½ inch steps. Each panel is 10 feet deep and 100 feet long. Other panel specifics can be found in Baremore et al. (2012). The six panels are strung together and fished as a single gear (i.e., set); one end of each set is anchored, and the opposite end is tied to the boat via a bridle.

Individual sampling strategies may differ between research institutions; however, in general, sets are chosen randomly and the gear is fished either perpendicular to shore or with the wind. It is the aim of the study to have half of the sets made in depths less than 5 meters (16 feet) and half in depths greater than 5 meters. In depths greater than 10 feet (the depth of the net), the gear acts like a midwater gillnet - the lead line weighs enough to hold the floats under the surface of the water but not enough to sink the net completely. In depth less than 10 feet, the gear fishes the entire water column. For all net configurations, the hanging ratio (length to height ratio of the meshes) is 0.5, leadline weight is 4.5 kilograms, 2.3 kilograms of buoyancy is used, and panel length is 100 feet.

Set soak time is defined from the time the gear enters the water to the time the gear is removed completely from the water. Haul back typically starts one half to one hour after the gear first enters the water. After haul back, the gear is moved to a different location, beginning a new set.

Drift Gillnet

The ACFCMA American Shad Drift Gillnet Survey, conducted by the South Carolina Department of Natural Resources, uses drift gillnets (Figure A-17) in several SC river systems to catch, tag, and release adult shad. They use a single 5 inch mesh net which is up to 450 ft in length and 22 ft depth. The net is set adrift for 20 minutes and constantly monitored for catch.

Trammel Net

The trammel net is a variation on the gillnet that consists of three layers of net (Figure A-18). A slack, small mesh, inner panel of netting is sandwiched between two outer layers of netting, which are taut and have a larger mesh size. The inner panel may be made of twisted monofilament or twisted nylon filament. Trammel nets are held vertically in the water by weights on the bottom (lead line), and floats on the top (float line). According to their design, ballasting and buoyancy, these nets may be used to fish near the surface, in mid-water or at the bottom, either in estuarine or marine waters.

The SEFSC uses trammel nets during the red drum stock assessment surveys in South Carolina. This trammel net is 183 meters by 2.1 meters and is fitted with a polyfoam float line and lead core bottom line.

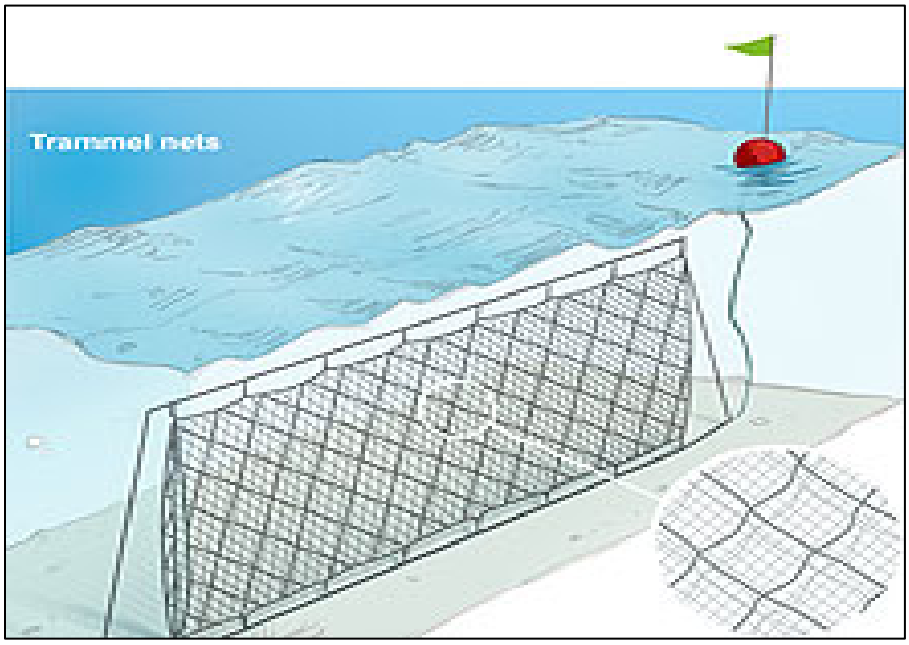

Figure A-18. Trammel net diagram

6 Traps/Pots

Fyke Nets

A fyke net is a fish trap that consists of cylindrical or cone-shaped netting bags that are mounted on rings or other rigid structures and fixed on the bottom by anchors, ballast or stakes (Figure A-19). Fyke traps are often outfitted with wings and/or leaders to guide fish towards the entrance of the bags. The fyke nets used by the SEFSC are constructed with wings that are 18.8 x 9 feet and bag netting of 700 micron mesh.

Figure A-19. Fyke net diagram

Shrimp Cages

Shrimp cages come in various shapes and are typically constructed of mesh or metal netting and a metal or PVC frame (Figure A-20). They work by being lowered from a vessel or shore onto the bottom of the sea floor where they are baited and left for a certain amount of time and then later retrieved. Shrimp cages are used by the SEFSC during their research on shrimp survival of two different populations. The SEFSC shrimp cages are constructed of 1-inch PVC poles that were oriented vertically attached to two fiberglass hoops and wrapped in 2mm mesh netting.

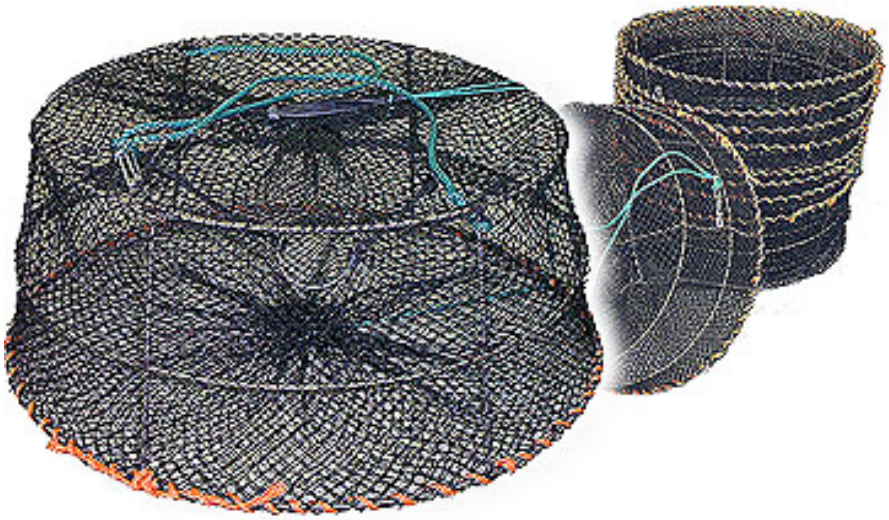

Figure A-20. Shrimp cage

Eel Traps/Pots

Eel traps (Figure A-21) and pots are portable metal traps that can be constructed of wood or metal and come in various shapes. The SEFSC uses a 16 x 20 x 11 inch trap with ½-inch metal mesh. The openings for the internal funnels are 2 x 3 inches, and the trap is baited with horseshoe crabs and shrimp heads.

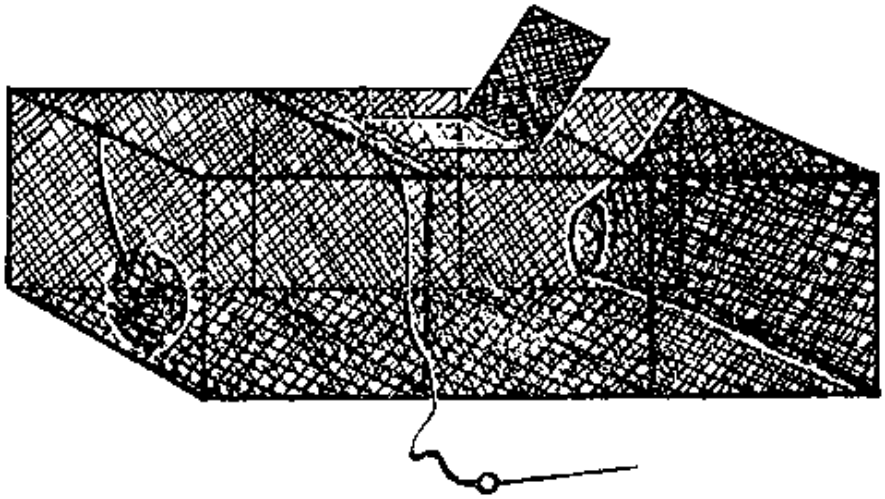

Figure A-21. Simple eel trap

Throw Trap

Throw traps (Figure A-22) are open ended boxes that are tossed into the environment that is being surveyed to randomly discern a survey area. The vegetation and fauna contained in the trap are then measured and assessed. Throw traps can be made of various types of materials depending on the intended use. A throw trap is used during the SEFSC Integrated Biscayne Bay Ecological Assessment and Monitoring Project to survey epifauna and small fish in the Everglades. The throw trap is constructed of aluminum with 1 m^2 walls and a depth of 45 cm.

Figure A-22. Throw trap

Chevron Fish Trap

Chevron fish traps are wire mesh fish cages that are used to sample fish populations (Figure A-23). The SEFSC uses several different chevron fish traps of various dimensions that are baited to attract target species.

Figure A-23. Chevron trap

7 Oceanographic Instruments

Conductivity, Temperature, and Depth (CTD) and Water Samples

A CTD profiler measures these parameters and is the primary research tool for determining chemical and physical properties of seawater. A CTD profiler may be a fairly small device (image on the left in Figure A-24) or it may be deployed with a variety of other oceanographic sensors and water sampling devices (e.g., Niskin or go-flo bottles) in a large (1 to 2 meter diameter) metal rosette wheel (image on the right in Figure A-23). The CTD profiler is lowered through the water column on a cable, and CTD data are collected either within the device or via a cable connecting to the ship. Water sampling devices range from a bucket dropped over the side of a small boat to Niskin bottles that are triggered at discrete depths to collect a suite of water samples throughout the water column. A CTD cast takes from minutes to hours to complete depending on water depth (WHOI 2011). The data from a suite of samples collected at different depths are often called a depth profile, and are plotted with the value of the variable of interest on the x-axis and the water depth on the y-axis. Depth profiles for different variables can be compared in order to glean information about physical, chemical, and biological processes occurring in the water column.

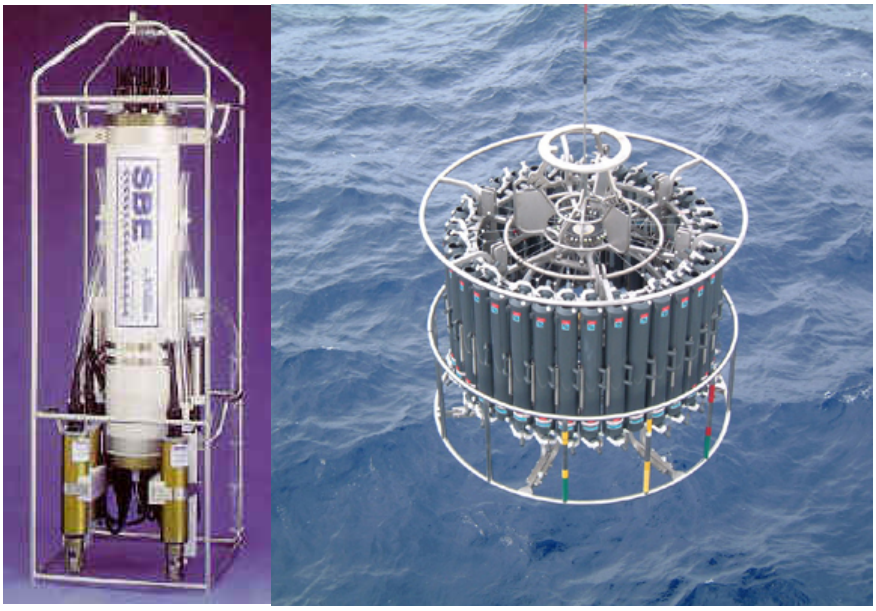

Figure A-24. Sea-Bird 911 and CTD profiler deployment on a sampling rosette with Niskin bottles

Credit: Sea-Bird Electronics, Bellevue WA

Secchi Disk

A secchi disk is a round disk with alternating black and white segments that is used to measure water turbidity and transparency (Figure A-25). Typically, the secchi disk is attached to a line that is marked at certain lengths to allow for depth measurement as the disk is lowered. The user lowers the secchi disk into the water until the black and white segments are indiscernible.

Figure A-25. Secchi disk

8 Remotely Operated Vehicles

THE ROV Super Phantom S2

The Super Phantom S2 (Figure A-26) is a powerful, versatile remotely operated vehicle (ROV) with high reliability and mobility. This light weight system can be deployed by two operators and is designed as an underwater platform which provides support services including color video, digital still photography, navigation instruments, laser scaling device, lights, position information of the ROV and support ship, vehicle heading, vehicle depth, and a powered tilt platform.

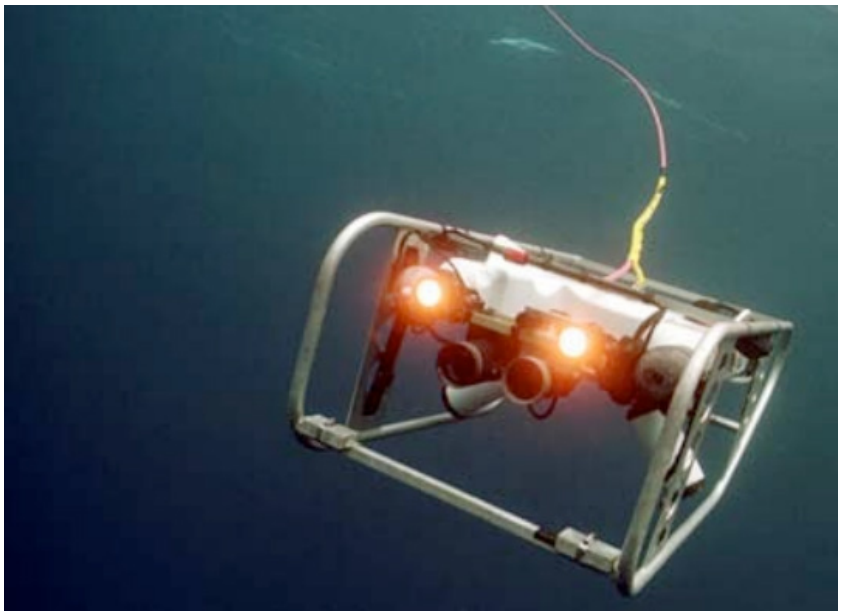

Figure A-26. ROV Super Phantom

MINI ROV

The Mini ROV is used during the SEFSC Panama City Reef Fish survey to help conduct line surveys and identify cryptic and rare fish species in the Gulf of Florida. The mini ROV is equipped with color video cameras and scaling lasers.

Underwater Scooters

Underwater scooters (Figure A-27) are used for both SEAMAP-C Queen Conch and Spiny Lobster surveys in order to help mobilize scuba divers while collecting data**.**

Figure A-27. Underwater scooter

9 Active Acoustic Sources

A wide range of active acoustic sources are used in SEFSC fisheries and ecosystem research for remotely sensing bathymetric, oceanographic, and biological features of the environment. Most of these sources involve relatively high frequency, directional, and brief repeated signals tuned to provide sufficient focus on and resolution of specific objects. Table A-1 shows important characteristics of these sources used on NOAA research vessels conducting SEFSC fisheries surveys, followed by descriptions of some of the primary general categories of sources, including all those for which acoustic takes of marine mammals are calculated in the LOA application.

Table A-1 Output characteristics for SEFSC active acoustic sources

Acoustic system	Operating frequencies (kHz)	Maximum source level (dB re 1 µPa at 1 m)	Single ping duration (ms) and repetition rate (Hz)	Orientation/ Directionality	Nominal beam width (degrees)
Simrad EK60 narrow beam echosounder	18, 38, 70, 120, 200, 333	224	1 ms @ 1 Hz	Downward looking	11°@18kHz; 7°@38kHz
Simrad ME70 multibeam echosounder	70-120	205	2 ms @ 1 Hz	Downward looking	140°
Simrad MS70 multibeam echosounder	70-120	206	2 ms @ 1 Hz	Downward side-looking	0° tilt angle from vertical (horizontal looking)
Simrad SX90 omni-directional multibeam sonar	70-120	206	2 ms @ 1 Hz	Downward omni-directional	0°-90° tilt angle from vertical (average)
ADCP Ocean Surveyor	75	223.6	External trigger	Downward looking (30° tilt)	N/A
Simrad ITI trawl monitoring system	27-33	<200	0.05-0.5 Hz repetition rate	Downward looking	40° x 100°

Multi-frequency Narrow Beam Scientific Echo Sounders (Simrad EK60)

Similar to multibeam echosounders, multi-frequency split-beam sensors are deployed from survey vessels for a variety of purposes: to acoustically map the distributions of many types of fish, estimate their abundances and biomasses, characterize their biotic and abiotic environments, investigate ecological linkages, and gather information about their schooling behavior, migration patterns, and avoidance reactions to the survey vessel. The use of multiple frequencies allows coverage of a broad range of marine acoustic survey activity, ranging from studies of small plankton to large fish schools in a variety of environments from shallow coastal waters to deep ocean basins. Simultaneous use of several discrete echosounder frequencies facilitates accurate estimates of the size of individual fish and can also be used for species identification based on differences in frequency-dependent acoustic backscattering between species. The SWFSC uses devices that transmit and receive at six frequencies (18, 38, 70, 120, 200, and 333 kHz).

Multi-beam Echosounders (Simrad ME70, MS70, SX90)

Multi-beam echosounders and sonars work by transmitting acoustic pulses into the water then measuring the time required for the pulses to reflect and return to the receiver and the angle of the reflected signal (Figure A-28). The depth and position of the reflecting surface can be determined from this information, provided that the speed of sound in water can be accurately calculated for the entire signal path. The use of multiple acoustic 'beams' allows coverage of a greater area compared to single beam sonar. The sensor arrays for multi-beam echosounders and sonars are usually mounted on the keel of the vessel and have the ability to look horizontally in the water column as well as straight down. Multi-beam echosounders and

sonars are used for mapping seafloor bathymetry, estimating fish biomass, characterizing fish schools, and studying fish behavior. The multi-beam echosounders used by the SEFSC emit frequencies in the 70-120 kHz range.

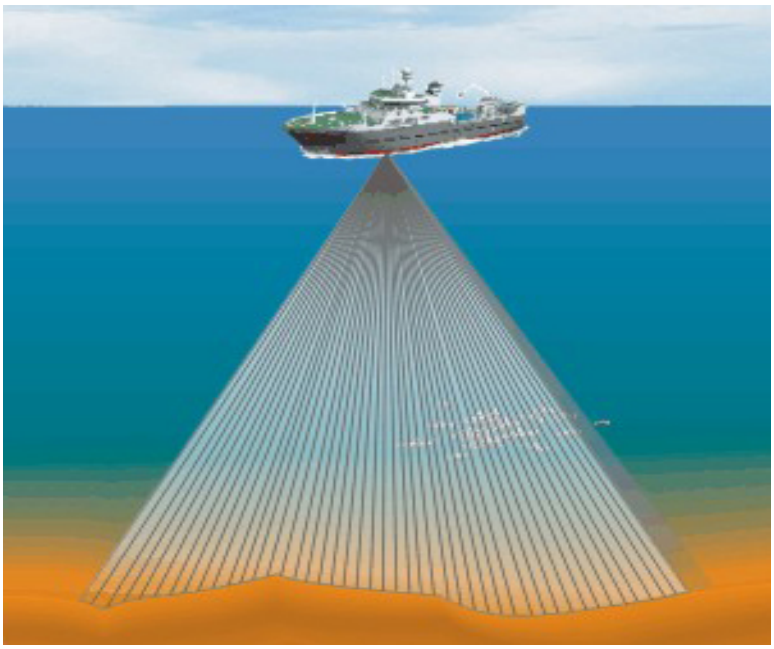

Figure A-28. Conceptual image of a multi-beam echosounder

Acoustic Doppler Current Profiler

An Acoustic Doppler Current Profiler (ADCP) is a type of sonar used for measuring water current velocities simultaneously at a range of depths. An ADCP instrument can be mounted to a mooring or to the bottom of a boat Figure A-29). The ADCP works by transmitting "pings" of sound at a constant frequency into the water. As the sound waves travel, they ricochet off particles suspended in the moving water, and reflect back to the instrument (WHOI 2011). Sound waves bounced back from a particle moving away from the profiler have a slightly lowered frequency when they return and particles moving toward the instrument send back higher frequency waves. The difference in frequency between the waves the profiler sends out and the waves it receives is called the Doppler shift. The instrument uses this shift to calculate how fast the particle and the water around it are moving. Sound waves that hit particles far from the profiler take longer to come back than waves that strike close by. By measuring the time it takes for the waves to return to the sensor, and the Doppler shift, the profiler can measure current speed at many different depths with each series of pings (WHOI 2011).

Figure A-29. ADCP pre-deployment

Trawl Monitoring Systems (Simrad ITI and FS70)

Trawl monitoring systems allow continuous monitoring of net dimensions during towing to assess consistency, maintain quality control, and provide swept area for biomass calculations. Transponders are typically located in various positions on the trawl or cables connecting the trawl to the ship. Data are monitored in real time to make adjustments in ship speed or depth of trawl to meet survey protocols.

10 Passive Acoustic Arrays

Passive Acoustic Monitoring is conducted by SEFSC during marine mammal surveys using two different towed hydrophone arrays. One is a hand-deployed two-element hydrophone array that is towed 200 meters behind the ship; the second is a five-element hydrophone array that can be towed up to 600 meters behind the ship (Figure A-30). The data collected can be used to determine population abundance and density of cetacean species.

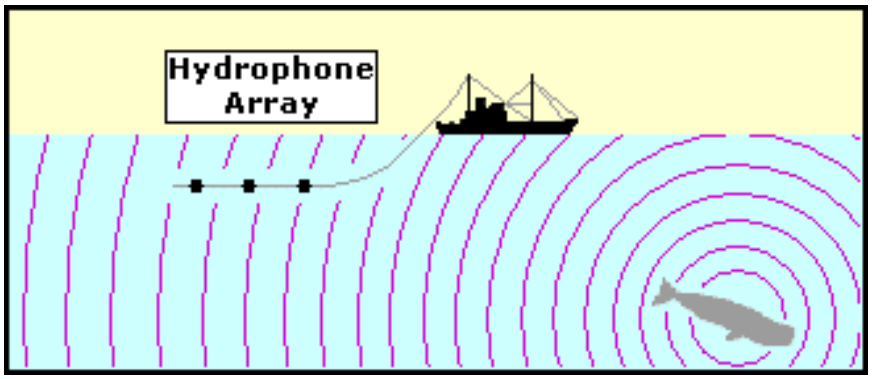

Figure A-30. Passive acoustic array towed behind vessel

11 Other Equipment Used

Expendable Bathythermographs

The SEFSC uses an Expendable Bathythermograph (XBT) to provide ocean temperature versus depth profiles. A standard XBT system consists of an expendable probe, a data processing/recording system, and a launcher (Figure A-31). The XBT probes consist of a metal weight surrounding a temperature probe, attached to a copper wire that conducts the signal to the vessel. Probes are generally launched from the leeward side of the vessel and as far out as possible. Launching from these locations helps obtain high reliability and minimizes the chances that the fine copper probe wire will come in contact with the ship's hull which may cause spikes in the data or a catastrophic wire break. A portable shipboard data acquisition system records, processes, and interprets the data the probes collect. The XBT probes are expendable; they are not retrieved and are left on the seafloor after data collection.

Figure A-31. Expendable XBT probe on the left; hand-held launcher on the right

Handheld Instruments

YSI instruments are handheld devices (several models are used) that measure dissolved oxygen, conductivity, salinity and temperature (Figure A-32). The various models consist of a micro-processor based, digital meter with an attached YSI combination conductivity and dissolved oxygen probe.

Figure A-32. YSI 85

Witham Collectors

Witham collectors are used to monitor the presence of juvenile fish in estuarine nursery areas, in particular gag (*Mycteroperca microlepis*). Witham collectors consist of air conditioner filter material folded over an 18 by 18 inch PVC frame (Figure A-33). They are anchored with a single line and floated off the bottom in tidal creeks that are about 1 m deep at low tide.

Figure A-33. Whitham collectors

Juvenile Lobster Artificial Shelters

Juvenile lobster shelters are used to collect specimens in shallow marine and estuarine areas. They consist of two tiers of eight concrete blocks (Figure A-34) and have been established in seagrass blowout areas (minimum of 2 to 3 meter water depth) in close proximity to fringing mangroves.

Figure A-34. Juvenile lobster shelter

Ponar Dredge

A ponar dredge is used to sample materials on the sea floor. The dredge consists of two opposing semi-circular jaws that are normally held open by a trigger mechanism. The sampler is lowered to the bottom where contact with the bottom sets off the trigger and a strong spring snaps the jaws shut trapping a sample (Figure A-35).

Figure A-35. Ponar dredge

12 Cameras

Go Pro Video Camera

Go Pro video cameras are portable and durable cameras that are easily mounted to objects in order to record things in unusual places. The SEFSC uses Go Pro cameras to document fish species during various studies by attaching them to fish traps.

Underwater Camera Sled

The first generation of underwater camera sled or Towed Optical Assessment Device (TOAD) used for the collection of optical validation data was a MiniBAT 8820 manufactured by Guideline Instruments (Figure A-36). The MiniBAT is a sled designed to be towed at 3–10 knots while being remotely guided by an operator on the towing vessel to keep it close to the seafloor. This iteration of TOAD is configured with a single Sony DCR-PC110 Digital Video Camera in a modified Gates underwater housing. It also features a Canon Power Shot G1 Still Camera (modified by SEFSC engineers) in an Ikelite housing rated to 60 meter depth. Illumination is provided by two 500-watt underwater lights.

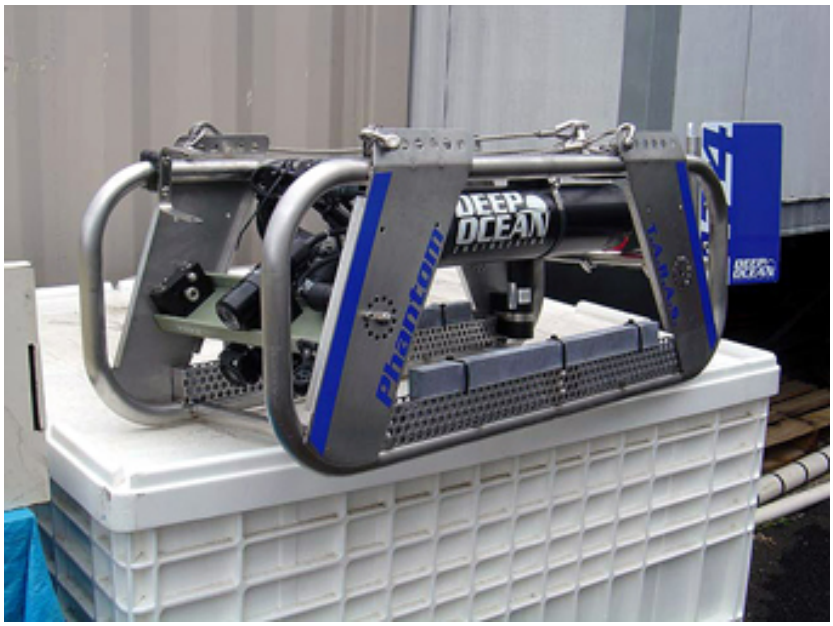

Figure A-36. Camera sled

4-Camera Array and 2-Camera Array

The 4- and 2-camera arrays used by the SEFSC consist of color cameras paired with black-and-white stereo cameras set inside an aluminum housing (Figure A-37). Before being lowered from the boat the arrays are baited with squid and then attached to a float by a line.

Figure A-37. Camera array

13 SEFSC Vessels Used for Survey Activities

The SEFSC and its research partners use a variety of different types and sizes of vessels to meet their needs and objectives. Vessels are also sometimes chartered from the commercial industry or other institutions/agencies. Vessels vary in size from small fishing vessels (U.S. Coast Guard [USCG] Class A – up to 16 ft. and Class I – 16 to <26 ft.), medium vessels (USCG Class II – 26 to <40 ft. and Class III – 40 to 65 ft.), USCG Small Research Vessel (R/V) (>65 ft. and <300 gross tons) and USCG Research Vessel (R/V) (>65 ft. and >300 gross tons). Several Motor Vessels (M/V) >65 feet and USCG Research Vessels are also chartered and used by partner agencies. Since the actual vessel can change frequently, especially for small vessels, only vessels >65 ft used by the SEFSC and partners and named NOAA vessels are described here.

R/V *Georgia Bulldog*

The University of Georgia research vessel R/V *Georgia Bulldog* (Figure A-38) was built in 1977 in St. Augustine Florida and is currently used for research on improving trawl gear as well as sea turtle research. The R/V *Georgia Bulldog* is rigged for various types of fishing that includes: shrimp trawlers, bottom trawl, longline, handline, dredges and traps. The vessel is 72-ft wooden-hull boat that is powered by a 6-cylinder Caterpillar 335 hp diesel engine. It can sleep a total of eight people. Special research equipment aboard the R/V *Georgia Bulldog* includes depth recorders, surface water temperature gauge, three VHF radios, two GPS units, plotter for navigation, color fish finding depth recorder, two radars, automatic pilot, real-time underwater video system, and two computers. The homeport for the R/V *Georgia Bulldog* is Brunswick, Georgia.

Figure A-38. R/V *Georgia Bulldog*

R/V *Lady Lisa*

The R/V *Lady Lisa* is a research vessel operated by the South Carolina Department of Natural Resources (Figure A-39). The R/V *Lady Lisa* is 75 feet in length with a wooden hull and was built in 1980. It is powered by a 415 HP, 12 cylinder Caterpillar engine and is capable of towing two 80-ft trawls. The vessel has accommodations for three crew members and eight scientists as well as dry storage space for gear and cold storage space for samples. The R/V *Lady Lisa* is the primary sampling platform for several state and federal projects, working mostly in near coastal waters between Cape Hatteras, NC and Cape Canaveral, Florida.

Figure A-39. R/V *Lady Lisa*

NOAA Ship *Gordon Gunter*

The *Gordon Gunter* (Figure A-40) primarily serves the NMFS Pascagoula Laboratory in Mississippi. The *Gordon Gunter* is a 224-ft. multi-use platform. It is equipped with a thermosalinograph, CTD, fluorometer, and other oceanographic instruments that monitor atmospheric and oceanic conditions while traveling. A variety of research gears are deployed from the vessel including stern trawling, longlining, plankton tows, and dredging. The *Gordon Gunter* operates in all three SEFSC research areas.

Figure A-40. NOAA Ship *Gordon Gunter*

NOAA Ship *Nancy Foster*

The *Nancy Foster* (Figure A-41) is a 187-ft research vessel that operates in all three SEFSC research areas. The *Nancy Foster* is used in habitat and fauna characterization in the nation's National Marine Sanctuaries as well as pollution assessments, bathymetric surveys, physical and chemical oceanography studies, maritime heritage surveys, and pollution assessments. On board equipment includes two cranes, A-frame, J-frame and two winches. Special research equipment includes wet and dry laboratories, computers for data acquisition and analysis, and instruments for obtaining oceanographic and atmospheric data. The ship also carries four different launches, ranging from 17-ft rigid hull inflatable boats to a 23-ft aluminum boat for diving and oceanographic operations in shallow water.

Figure A-41. NOAA Ship *Nancy Foster*

NOAA Ship *Oregon II*

The *Oregon II* is a 170-ft NOAA research vessel that is used for living marine resource studies in support of the SEFSC Pascagoula Laboratory (Figure A-42). The vessel is operated in all three SEFSC research areas and has several types of fishing and research gear used on board that includes: a double-rigged shrimp trawl, longline winch, fish trap, dredge, electronic fish detection equipment, environmental sensors, and electronics equipment.

Figure A-42. NOAA Ship *Oregon II*

NOAA Ship *Pisces*

The *Pisces* is a 208-ft NOAA research vessel capable of carrying a crew of 21 and up to 15 scientists (Figure A-43). The *Pisces* is a newly constructed fisheries research vessel launched in 2007 and commissioned in 2008. The vessel is operated in all three SEFSC research areas and has multiple types of fishing and research gear available. A special feature of the new ship is its quiet hull design that minimizes the sound transmitted underwater, making this ship ideal for surveying marine life.

Figure A-43. NOAA Ship *Pisces*

NOAA Ship *Thomas Jefferson*

The *Thomas Jefferson* is a 208-ft research vessel that is operated in all three SEFSC research areas (Figure A-44). The vessel is equipped with surveying gear such as GPS, side-scan and multibeam sonar-imaging, and state-of-the-art computers. On-board equipment is used to conduct hydrographic surveys for udpdating NOAA's nautical charts.

Figure A-44. NOAA Ship *Thomas Jefferson*

NOAA Vessel R/V *Harold B*

The R/V *Harold B* (Figure A-45) is a 36-foot ex-Navy aluminum hulled dive boat stationed at the NOAA Fisheries Panama City Laboratory for use in the coastal waters of northwest Florida. The vessel is a 1988 heavily built Munson hull in good condition powered by two John Deere 225 hp diesel engines, vessel also has a Kohler 8EOZ generator. The vessel can operate in inshore and offshore waters no greater than 125 miles from the nearest land. The vessel can, and will, carry up to eight persons, including the vessel operator for voyages up to 12 hours away from port. The vessel is configured for fishing operations, traps, longlines, diving, use of remotely operated vehicles (ROV). Deck modifications include the addition of a davit and hydraulic pot hauler on the aft deck to be used for lifting traps and sampling gear. The vessel is restricted to day time operations only and is restricted from performing restricted ability to maneuver operations at night and during periods of limited visibility. Special Equipment includes GPS (2), Fish/Depth finder (2), Radar, DSC VHF (2), SSB (1), EPIRB, SART and an on-board computer w/ Nobeltec navigation software.

Figure A-45. NOAA Vessel R/V *Harold B*

UNOLS R/V *Savannah*

The R/V *Savannah* (Figure A-46) is a multi-use 92' oceanographic and fisheries research vessel operated by the Skidaway Institute of Oceanography, homeported in Savannah, Georgia, and is a member of the University National Oceanographic Laboratory System (UNOLS) fleet. The R/V *Savannah* can sleep a total of 20 people and is used for biological, chemical, physical, and geological oceanographic studies in estuarine and continental shelf waters throughout the southeastern US Atlantic and Gulf Coasts. It can deploy trawls, longlines, handlines, dredges, traps, buoys, landers, and autonomous underwater vehicles, and is equipped with motion-compensated depth recorders, an acoustic doppler current profiler, CTD, crane, A-frame, pot hauler, flow-through systems, and a network of on-board ship sensors.

Figure A-46. UNOLS R/V *Savannah*

R/V *Tommy Munro*

The R/V *Tommy Munro* (Figure A-47) is a 97.5-ft research vessel owned and operated by the University of Southern Mississippi's Gulf Coast Research Laboratory. It has a range of 2,500 nautical miles and berthing for ten scientists and six crew. The vessel is driven by twin GM V12-71 engines each capable of 300 hp @ 1,800 RPM. Electrical power is provided by 2 GM-4-71 diesel-powered generators supplying 50 kw (208/120V AC). Hydraulic power is obtained from one 15 GPM @ 2000 psi system and one 6 GPM @ 2,000 psi system. The vessel is capable of a multitude of scientific collection applications, including trawling, long-lining, plankton sampling, water collection and CTD profiles, benthic grabs, fish/crab trap deployment/retrieval, sensor deployment/retrieval, and mapping.

Figure A-47. R/V *Tommy Munro*

NOAA Vessel R/V *Mokarran* F2504

The Research Vessel *Mokarran* F2504 (Figure A-48) is a 25 foot Boston Whaler with a fiberglass hull that is used for the GULFSPAN Survey and dive operations in support of the SEFSC Panama City Laboratory. It is currently configured for in- and nearshore fishing operations, including gillnetting and longlining. The vessel can carry up to 5 people, including the vessel operator, and operates in Florida state waters no greater than 2 miles from shore. The vessel has been modified from its original design by the addition of a permanent aluminum frame and canvas top. It is equipped with a depth recorder, surface water temperature gauge, GPS plotter for navigation, electronic fish detection equipment, VHS, and an auto-release EPIRB. The home port for the R/V *Mokarran* is Panama City, Florida.

Figure A-48. NOAA Vessel R/V *Mokarran* F2504

NOAA Vessel R/V *Caretta*

The R/V *Caretta* is a 58 ft steel-hull NOAA research vessel that is used for living marine resource studies in support of the SEFSC Pascagoula Laboratory (Figure A-49). The vessel can sleep a total of six people. A variety of research gear deployed from the vessel includes: shrimp trawls with otter boards or skimmers, longlines, handlines, bandit reels, traps, CTD'S, camera arrays. It is equipped with depth recorders, surface water temperature gauge, and plotter for navigation, CTD winch, small crane. The homeport for the R/V *Caretta* is Pascagoula, MS. The R/V *Caretta* operates in state and federal waters from western Louisiana through the west Coast of Florida.

Figure A-49. NOAA Vessel R/V *Caretta*

R/V *Bellows*

The R/V *Bellows* (Figure A-50) is owned by the State of Florida and is operated by the Florida Institute of Oceanography on behalf of the State University System. It is designated and certified as an Oceanographic Research Vessel by the US Coast Guard. The R/V *Bellows* is 71-ft long and has a 20-ft beam. The vessel can accommodate 10 scientists and there is 275 sq. ft of deck space and a 185 sq. ft wetlab/drylab air-conditioned area. The vessel is equipped with hydraulic winches to operate CTDs, small trawls or bottom dredges. The vessel is operated out of St. Petersburg, FL.

Figure A-50. R/V *Bellows*

R/V *Weatherbird II*

The R/V *Weatherbird II* (Figure A-51) is owned by the University of South Florida for use through the Florida Institute of Oceanography. The vessel was built in 1982, by Bosarge Marine in Bayou La Batre, AL. This vessel is equipped with advanced laboratories, oceanographic devices and sensor technology designed to enable scientists and students to study and learn about various aspects of the ocean's biological, chemical, geological and physical characteristics. The R/V *Weatherbird II* is 115-ft long and has a 28-ft beam and cruises at 10kts. The vessel can accommodate 13 scientists and 6 crew. There is 780 sq. ft. deck space and a 200 sq. ft wetlab. The vessel is equipped with hydraulic winches for CTDs and trawls. The vessel is operated out of St. Petersburg, FL.

Figure A-51. R/V *Weatherbird II*

R/V *Apalachee*

The R/V *Apalachee* (Figure A-52) is owned and operated by the Florida State University Coastal and Marine Laboratory. The vessel was built by Geo Shipyard, Inc. in New Iberia, LA in 2013. It was designed to work in coastal and offshore waters, allowing scientists and students to conduct research on the ocean's biological, chemical, geological and physical characteristics that affect global and coastal oceans. The R/V *Apalachee* is 65-ft. long and has a 22-ft beam and cruises at 12 – 16kts. The vessel can accommodate 4 – 6 scientists and 2 crew. There is 780 sq. ft deck space and 200 sq. ft wetlab and 200 sq. ft. drylab space. The vessel has a winch and A-frame on the stern and can operate small trawls. The vessel is operated out of St. Teresa, FL.

Figure A-52. R/V *Apalachee*

R/V *Palmetto*

The 110 foot R/V *Palmetto* is South Carolina Department of Natural Resources' offshore research vessel (Figure A-53). Made of steel and powered by twin 550 HP diesel engines, the vessel generally conducts scientific research from Cape Lookout, NC to Palm Beach, Florida and out to over 200 miles. The vessel operates around the clock for up to 10 days at sea with a crew of 6, and it has berthing for 9 scientists. Bridge electronics include GPS integrated into computerized navigation software, satellite communications including email capabilities, as well as standard radar, radios, depth-sounders, air and sea temperature sensors, etc. The air-conditioned wet lab has its own navigation electronics and computer facilities. On deck equipment include a seawater ice maker, marine crane, A-frame, winch, and hydraulic pot hauler allowing deployment and retrieval of a wide variety of research instruments and sampling gears. (https://www.dnr.sc.gov/marine/mrri/vessels/palmetto.html)

Figure A-53. R/V *Palmetto*

R/V *Cape Hatteras*

The R/V *Cape Hatteras* is a 135 foot steel-hull research vessel owned and operated by Cape Fear Community College (Figure A-54). The vessel was built in 1981 by Atlantic Marine Ship Builders, Fort George Island. FL and is available for oceanographic research use through charters by outside agencies. The vessel is capable of carrying a crew of 8 and up to 19 scientists and can endure 25 days at sea. The vessel has multiple types of fishing and research gear available including a trawl winch, CTD winch, Markey portable electric winch, J-frame and stern A-frame.

Figure A-54. R/V *Cape Hatteras*

M/V *Spree*

The M/V *Spree* (Figure A-55) is a 100 foot aluminum crew boat refit for open-ocean diving owned and operated by Spree Expeditions Inc. The vessel is capable of carrying 22 passengers, 2 trip leaders, and up to 8 boat crew, for a maximum of 32 people aboard and can endure 25 days at sea. The M/V *Spree* is powered by three 12V71 Detroit Diesel engines and runs at a top speed of approximately 16 knots. The vessel has multiple types of fishing and research gear available including a lifting Davit 500 lb. capacity, towing Davit 1,000 lb. capacity, pot Hauler 800 lb. capacity, Hydraulic Crane 7,000 lb. capacity, NAVTEX Furuno NX-300, autopilot Simrad AP-45, and Satellite: Thrane and Thrane VOIP.

Figure A-55. M/V *Spree*

R/V *Pelican*

The 116 ft. R/V *Pelican* (Figure A-56) was designed and outfitted to conduct a variety of oceanographic research missions. The R/V *Pelican* successfully conducts scientific trawling, MOCNESS trawls, large box core sampling, thirty-foot piston cores, shallow seismic surveys, current meter array and benthic boundary array deployment and recovery. The R/V *Pelican* has also successfully conducted plankton sampling, hydrographic casts with CTD-rosette system, ADCP sampling and underway collection sampling (SCS) and with towed water sampling systems. The vessel is owned by the State of Louisiana, operated by Louisiana Universities Marine Consortium (LUMCON) and homeported in Cocodrie, Louisiana. The vessel is operated as an Research Vessel as designated by the USCG. The vessel is available for legitimate research and education programs of Consortium members, state and federal agencies, other nonprofit groups, and oceanographic industries. The R/V *Pelican* operates primarily in the Gulf of Mexico but has been conducting research as far north as Canada and as far south as Trinidad.

Figure A-56. R/V *Pelican*

R/V *Point Sur*

The 135 ft. R/V *Point Sur* (Figure A-57) was also designed, built and outfitted in 1980 to conduct a variety of oceanographic research missions. The vessel is owned by the University of Southern Mississippi and is managed and operated by LUMCON. The R/V *Point Sur* successfully conducts scientific trawling, MOCNESS trawls, large box core sampling, shallow seismic surveys, current meter array and benthic boundary array deployment and recovery. The vessel has also successfully conducted multiple types of mooring operations, plankton sampling, ADCP sampling, hydrographic casts with CTD-rosette system and underway water collecting sampling systems (SCS). The vessel is homeported in Gulfport, Mississippi at the Port of Gulfport. The vessel is operated as a Research Vessel as designated by the USCG. The vessel is available for legitimate research and education programs of LUMCON and USM members, state and federal agencies, other nonprofit groups, and oceanographic industries.

Figure A-57. R/V *Point Sur*

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Southeast Fisheries Science Center

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Appendix B

Spatial and Temporal Distribution of SEFSC Fisheries and Ecosystem Research Effort

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Spatial and Temporal Distribution of SEFSC Fisheries and Ecosystem Research Effort by Gear Type in the Gulf of Mexico Research Area, the Atlantic Research Area, and the Caribbean Research Area

This appendix provides a synopsis of SEFSC fisheries research effort by gear type and by season in the Gulf of Mexico Research Area, the Atlantic Research Area, and the Caribbean Research Area. This appendix provides information about the spatial and temporal distribution of research effort in the three research areas to complement the information provided in Table 2.2-1.

The data presented in the figures below are survey points for the most recent year of available data. This is meant to give a representation of an average year of surveying using some of the most common gear types in each season for each research area.

Table B-1 SEFSC Research Effort by Gear Type in the Gulf of Mexico Research Area by Season

Gear type	Surveys	Gear Description	Sampling Events	Effort
Gulf of Mexico Research Area				
Spring (March-May) [map in Figure 1]				
Bandit reel	Northeast (NE) Gulf of Mexico Marine Protected Area (MPA) Survey	8/0 or 11/0 circle hooks	10 sets	10 gangions/set, 5-10 min soak
	SEAMAP-GOM Vertical Line Survey	8/0, 11/0 or 15/0 circle hooks	120 sets in AL 72 sets in LA	10 gangions/set, 5 min soak
Benthic trawl	St. Andrew Bay Juvenile Reef Fish Trawl Survey	1 m x 25 cm high metal frame net	156 trawls	Deployed/retrieved by hand, duration 30 sec
Bottom longline	SEAMAP-GOM Bottom Longline Survey	1 nm mainline, 15/0 circle hooks	12 sets in AL 18 sets in MS 30 sets in LA 8 sets in TX	100 gangions/set, 1 hr soak
	Highly Migratory Species (HMS), Gulf of Mexico Shark Pupping & Nursery (GULFSPAN)	10/0, 12/0, 14/0, 16/0 hooks	6 sets	25 of each hook size, soak time 1 hr
Chevron fish trap	SEAMAP-GOM Reef Fish Survey	6 x 6 ft trap	33-66 sets	1 hr soak
CTD profiler and/or rosette water sampler	Pelagic Longline Survey	Tow speed 0 kts	50-65 casts	Duration 10-20 min
	SEAMAP-GOM Bottom Longline Survey	Tow speed 0 kts	12 casts in AL 18 casts in MS 30 casts in LA 8 casts in TX	Duration 5-15 min
	NE Gulf of Mexico MPA Survey	Tow speed 0 kts	50-100 casts	Duration 5-20 min
	SEAMAP-GOM Reef Fish Survey	Tow speed 0 kts	266-400 casts	Duration 5-20 min

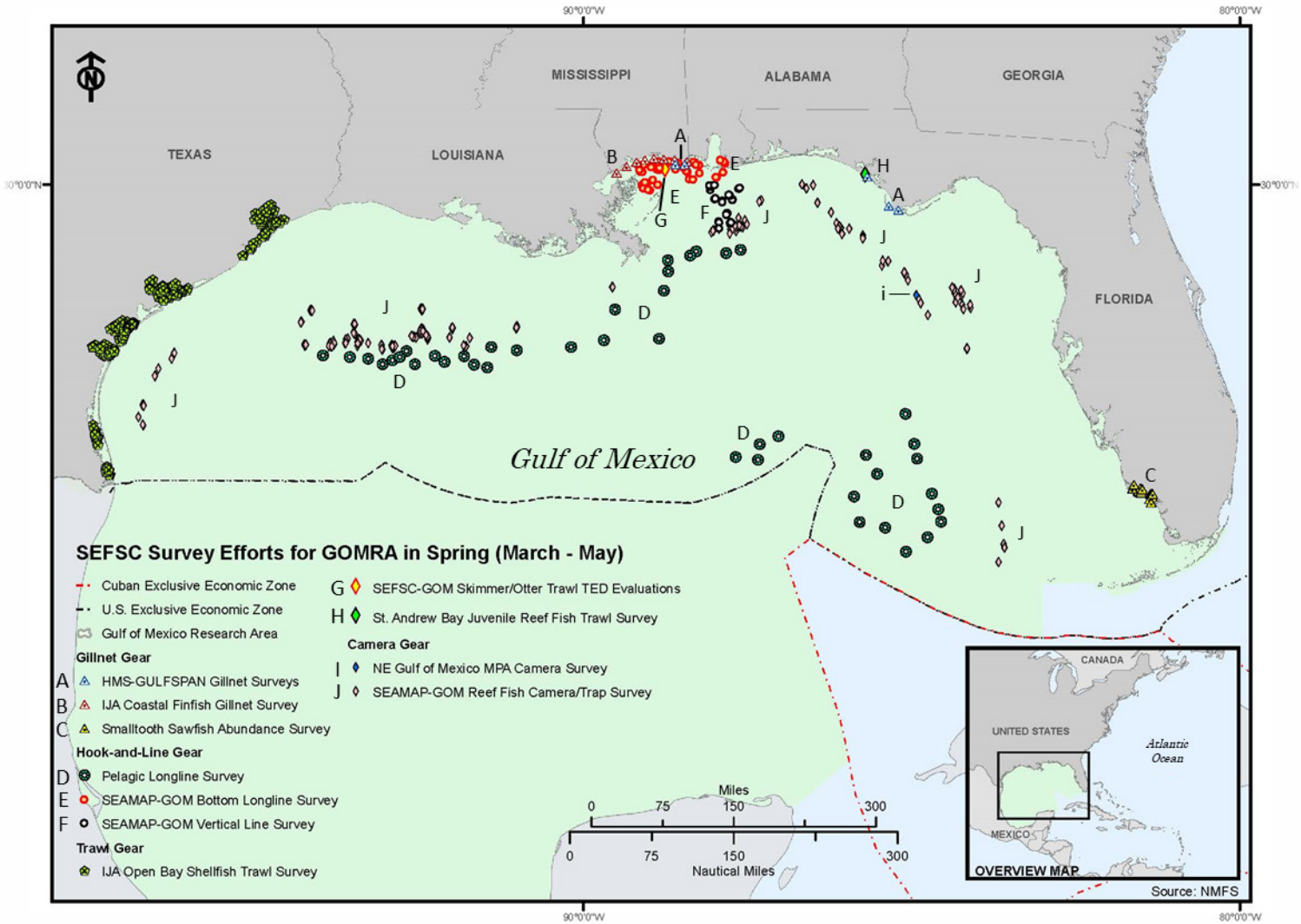
Gear type	Surveys	Gear Description	Sampling Events	Effort
Gillnet	IJA Coastal Finfish Gillnet Survey	750 ft long x 6 ft deep net	24 sets	Duration 1 hr
	HMS, GULFSPAN	6 mesh panels strung together, each 10 ft deep by 100 ft long	64 sets in NW FL 6 sets in FL panhandle 9 sets in MS	Duration < 1 hr
	Smalltooth Sawfish Abundance Survey	100 ft or 200 ft long nets, 0.2-1.0 m depths	60 sets	Duration 1-4 hr
Otter trawl	IJA Open Bay Shellfish Trawl Survey	20 ft net	270 trawls	Duration 10 min
Pelagic longline	Pelagic Longline Survey	5 nm mainline, 18/0 non-offset circle hooks, 50 bullet floats	50-65 sets	100 gangions/set, 3 hr soak
Skimmer trawl	SEFSC Skimmer Trawl Turtle Excluder Device (TED) Testing	Two 19 ft 2-seam trawls	75 paired trawls	Duration 55 min, tow speed 2.5 kts
Western jib shrimp trawl	SEFSC-GOM TED Evaluation	Two 50 ft trawls	30 paired trawls	Duration 55 min, tow speed 2.5 kts
Summer (June-August) [map in Figure 2]				
Bandit reel	SEAMAP-GOM Reef Fish Survey	8/0 or 11/0 circle hooks	40 sets	10 gangions/set, 5-10 min soak
	SEAMAP-GOM Vertical Line Survey	8/0, 11/0 or 15/0 circle hooks	120 sets in AL 144 sets in LA	10 gangions/set, 5 min soak
Benthic trawl	St. Andrew Bay Juvenile Reef Fish Trawl Survey	1 m x 25 cm high metal frame net	208 trawls	Duration 30 sec, tow speed 3.1 kts
Bongo net	SEAMAP-GOM Shrimp/Groundfish Trawl Survey	Bongo net	110 tows	Duration 5-15 min, tow speed 0 kts
Bottom longline	HMS, GULFSPAN	10/0, 12/0, 14/0, 16/0 hooks	58 sets	25 of each hook size, soak time 1 hr
	Shark and Red Snapper Bottom Longline Survey	1 nm mainline, 15/0 circle hooks	120-140 sets	100 gangions/set, 1 hr soak
	SEAMAP-GOM Bottom Longline Survey	1 nm mainline, 15/0 circle hooks	16 sets in AL 24 sets in MS 60 sets in LA 10 sets in TX	100 gangions/set, 1 hr soak

Gear type	Surveys	Gear Description	Sampling Events	Effort
Chevron fish trap	SEAMAP-GOM Reef Fish Monitoring	5.8 ft x 5 ft x 2 ft trap	200-300 sets	60 min soak
	SEAMAP-GOM Reef Fish Survey	6 x 6 ft trap	17-33 sets	1 hr soak
CTD profiler and/or rosette water sampler	Shark and Red Snapper Bottom Longline Survey	Tow speed 0 kts	120-140 casts	Duration 5-15 min
	SEAMAP-GOM Bottom Longline Survey	Tow speed 0 kts	16 casts in AL 24 casts in MS 60 casts in LA 10 casts in TX	Duration 5-15 min
	SEAMAP-GOM Reef Fish Monitoring	Tow speed 0 kts	200 casts	Duration 5-15 min
	SEAMAP-GOM Reef Fish Survey	Tow speed 0 kts	133-200 casts	Duration 5-10 min
	SEAMAP-GOM Shrimp/Groundfish Trawl Survey	Tow speed 0 kts	395 casts	Duration 8-20 min
Gillnet	IJA Coastal Finfish Gillnet Survey	750 ft long x 6 ft deep net	32 sets	Duration 1 hr
	HMS, GULFSPAN	6 mesh panels strung together, each 10 ft deep by 100 ft long	86 sets in FL panhandle 58 sets in NW FL 12 sets in MS	Duration < 1 hr
	Smalltooth Sawfish Abundance Survey	100 or 200 ft long nets, 0.2-1.0 m depths	80 sets	Duration 1-4 hr
Neuston net	SEAMAP-GOM Shrimp/Groundfish Trawl Survey	Neuston net	115 tows	Duration 10 min or 30 min, tow speed 1-2 kts
Otter trawl	IJA Open Bay Shellfish Trawl Survey	20 ft trawl	360 trawls	Duration 10 min
	SEAMAP-GOM Shrimp/Groundfish Trawl Survey	42 ft or 20 ft trawl	345 trawls	Duration 30 min, tow speed 2.5 kts
Skimmer trawl	SEFSC Skimmer Trawl TED Testing	Two 19 ft 2-seam trawls	300 paired trawls	Duration 55 min, tow speed 2.5 kts
Western jib shrimp trawl	SEFSC-GOM TED Evaluations	Two 50 ft trawls	60 paired trawls	Duration 55 min, tow speed 2.5 kts

Gear type	Surveys	Gear Description	Sampling Events	Effort
Fall (September-November) [map in Figure 3]				
Bandit reel	SEAMAP-GOM Vertical Line Survey	8/0, 11/0 or 15/0 circle hooks	60 sets	10 gangions/set, 5 min soak
Benthic trawl	St. Andrew Bay Juvenile Reef Fish Trawl Survey	1 m x 25 cm high metal frame net	104 trawls	Duration 30 sec, tow speed 3.1 kts
Bongo net	Small Pelagics Trawl Survey	Bongo net	40-50 tows	Duration 5-15 min, tow speed 0 kts
	SEAMAP-GOM Shrimp/Groundfish Trawl Survey	Bongo net	50 tows	Duration 5-15 min, tow speed 0 kts
Bottom longline	SEAMAP-GOM Bottom Longline Survey	1 nm mainline, 15/0 circle hooks	4 sets in AL 12 sets in MS 5 sets in TX	100 gangions/set, 1 hr soak
	HMS, GULFSPAN	10/0, 12/0, 14/0, 16/0 hooks	4 sets	25 of each hook size, soak time 1 hr
	Shark and Red Snapper Bottom Longline Survey	1 nm mainline, 15/0 circle hooks	120-140 sets	100 gangions/set, 1 hr soak
Chevron fish trap	SEAMAP-GOM Reef Fish Monitoring	5.8 ft x 5 ft x 2 ft trap	100-150 sets	60 min soak
CTD profiler and/or rosette water sampler	SEAMAP-GOM Bottom Longline Survey	Tow speed 0 kts	8 casts in AL 12 casts in MS 5 casts in TX	Duration 5-15 min
	SEAMAP-GOM Shrimp/Groundfish Trawl Survey	Tow speed 0 kts	202 casts	Duration 8-20 min
	SEAMAP-GOM Reef Fish Monitoring	Tow speed 0 kts	100 casts	Duration 5-15 min
	Otter trawl	Tow speed 0 kts	120-140 casts	Duration 5-15 min
	Small Pelagics Trawl Survey	Tow speed 0 kts	250 casts	Duration 8-20 min

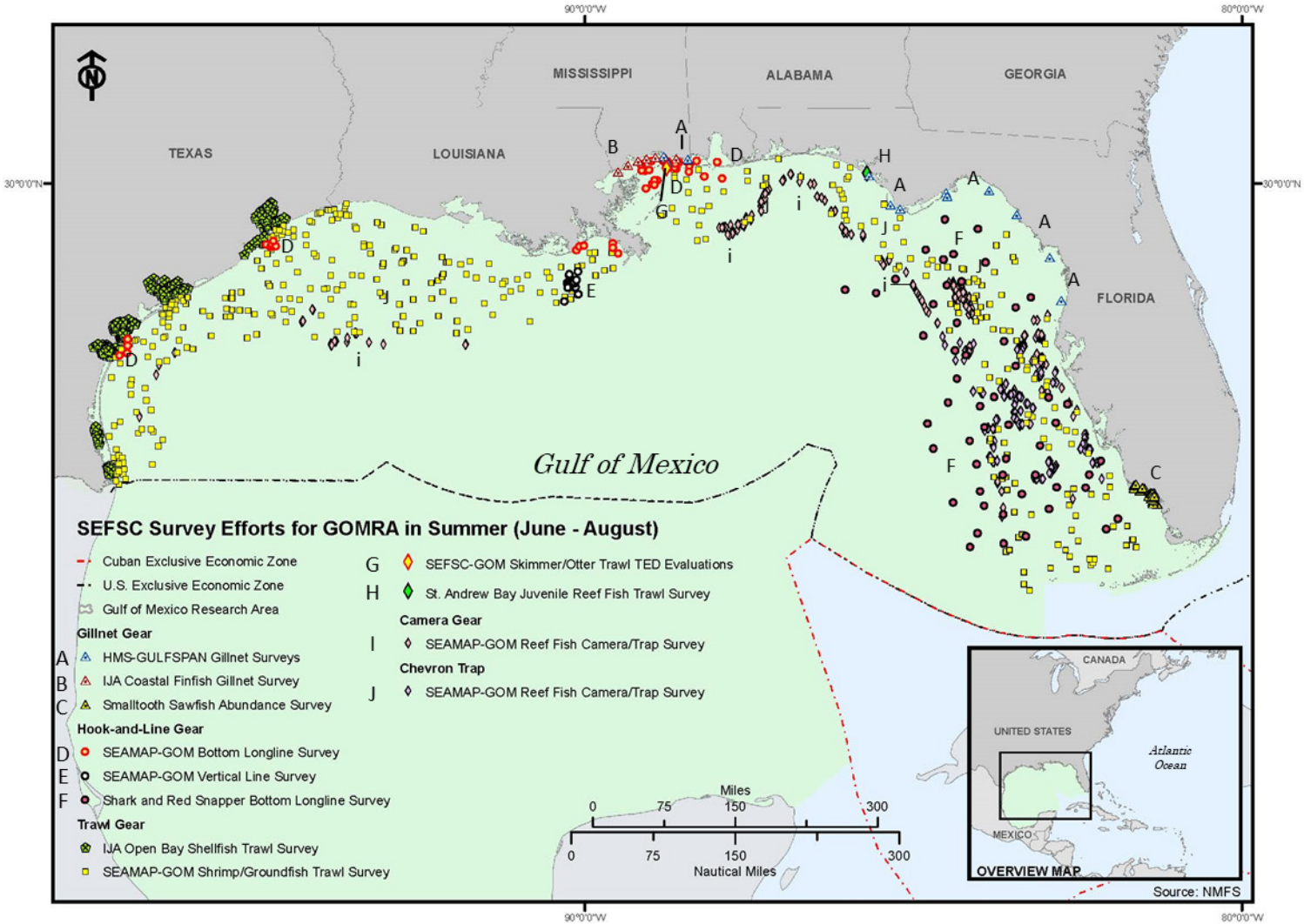
Gear type	Surveys	Gear Description	Sampling Events	Effort
Gillnet	IJA Coastal Finfish Gillnet Survey	750 ft long x 6 ft deep net	16 sets	Duration 1 hr
	HMS, GULFSPAN	6 mesh panels strung together, each 10 ft deep by 100 ft long	43 sets in NW FL 4 sets in FL panhandle 3 sets in MS	Duration < 1 hr
	Smalltooth Sawfish Abundance Survey	100 ft or 200 ft long nets, 0.2-1.0 m depths	40 sets	Duration 1-4 hr
High-opening bottom trawl	Small Pelagics Trawl Survey	90 ft net	150-200 trawls	Duration 30 min Tow speed 3.0 kts
Neuston net	Small Pelagics Trawl Survey	Neuston net	40-50 tows	Duration 10 min, tow speed 1-2 kts
	SEAMAP-GOM Shrimp/Groundfish Trawl Survey	Neuston net	50 tows	Duration 10 min or 30 min, tow speed 1-2 kts
Otter trawl	IJA Open Bay Shellfish Trawl Survey	20 ft net	180 trawls	Duration 10 min
	SEAMAP-GOM Shrimp/Groundfish Trawl Survey	42 ft net	217 trawls	Duration 30 min, tow speed 2.5 kts
Skimmer trawl	SEFSC Skimmer Trawl TED Testing	Two 19 ft 2-seam trawls	150 paired trawls	Duration 55 min, tow speed 2.5 kts
Winter (December-February) [map in Figure 4]				
Bandit reel	NE Gulf of Mexico MPA Survey	8/0 or 11/0 circle hooks	10 sets	10 gangions/set, 5-10 min soak
	SEAMAP-GOM Vertical Line Survey	8/0, 11/0 or 15/0 circle hooks	60 sets	10 gangions/set, 5 min soak
CTD and/or rosette water sampler	NE Gulf of Mexico MPA Survey	Tow speed 0 kts	50-100 casts	Duration 5-20 min
Gillnet	IJA Coastal Finfish Gillnet Survey	750 ft long x 6 ft deep net	24 sets	Duration 1 hr
Otter trawl	IJA Open Bay Shellfish Trawl Survey	20 ft net	270 trawls	Duration 10 min
	SEAMAP-GOM Shrimp/Groundfish Trawl Survey	42 ft net	108 trawls	Duration 30 min, tow speed 2.5 kts
Skimmer trawl	SEFSC Skimmer Trawl TED Testing	Two 19 ft 2-seam trawls	75 paired trawls	Duration 55 min, tow speed 2.5 kts

Figure 1 Distribution of SEFSC research effort in the Gulf of Mexico Research Area in spring



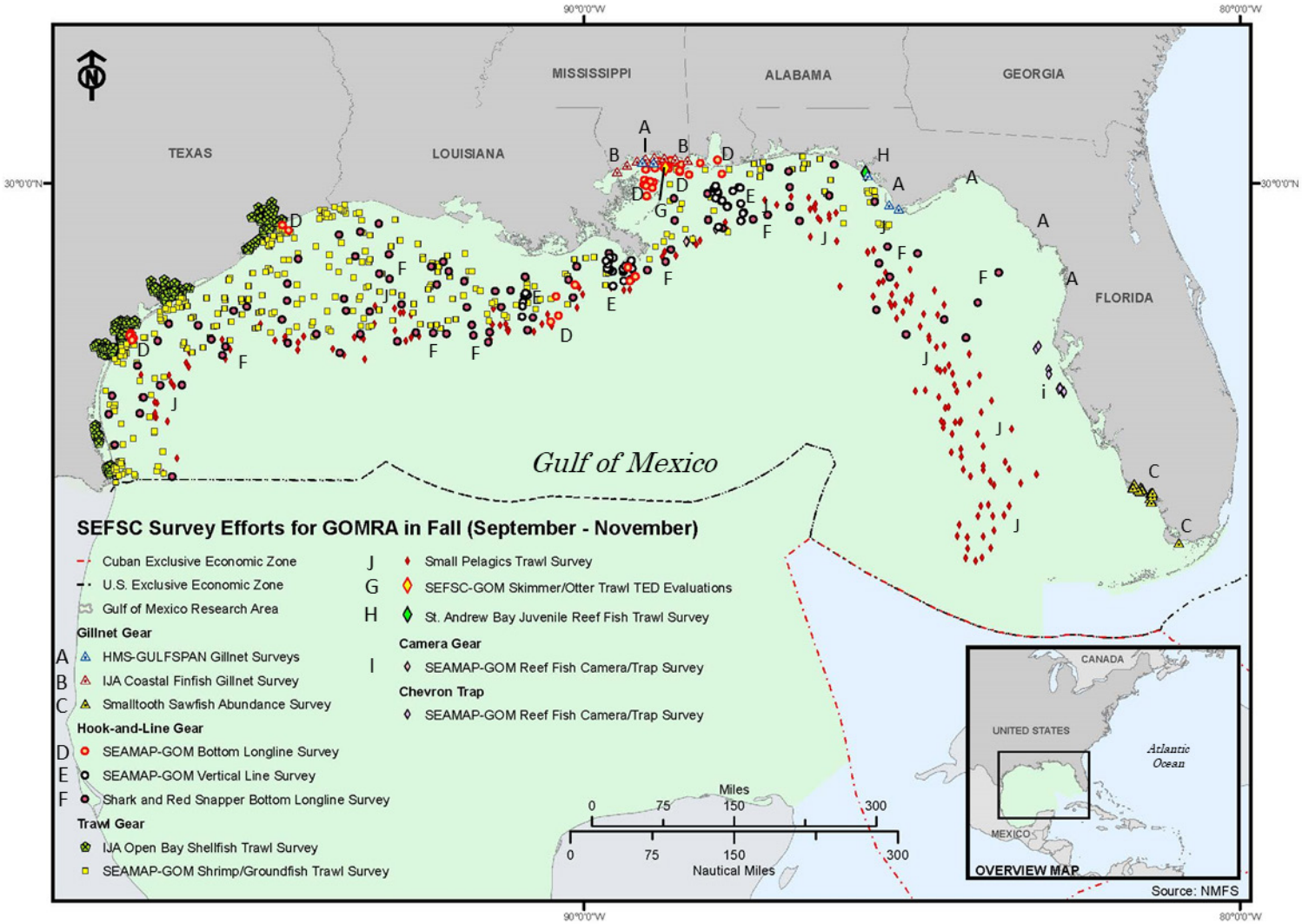
Refer back to Table B-1, Spring (March-May)

Figure 2 Distribution of SEFSC research effort in the Gulf of Mexico Research Area in summer



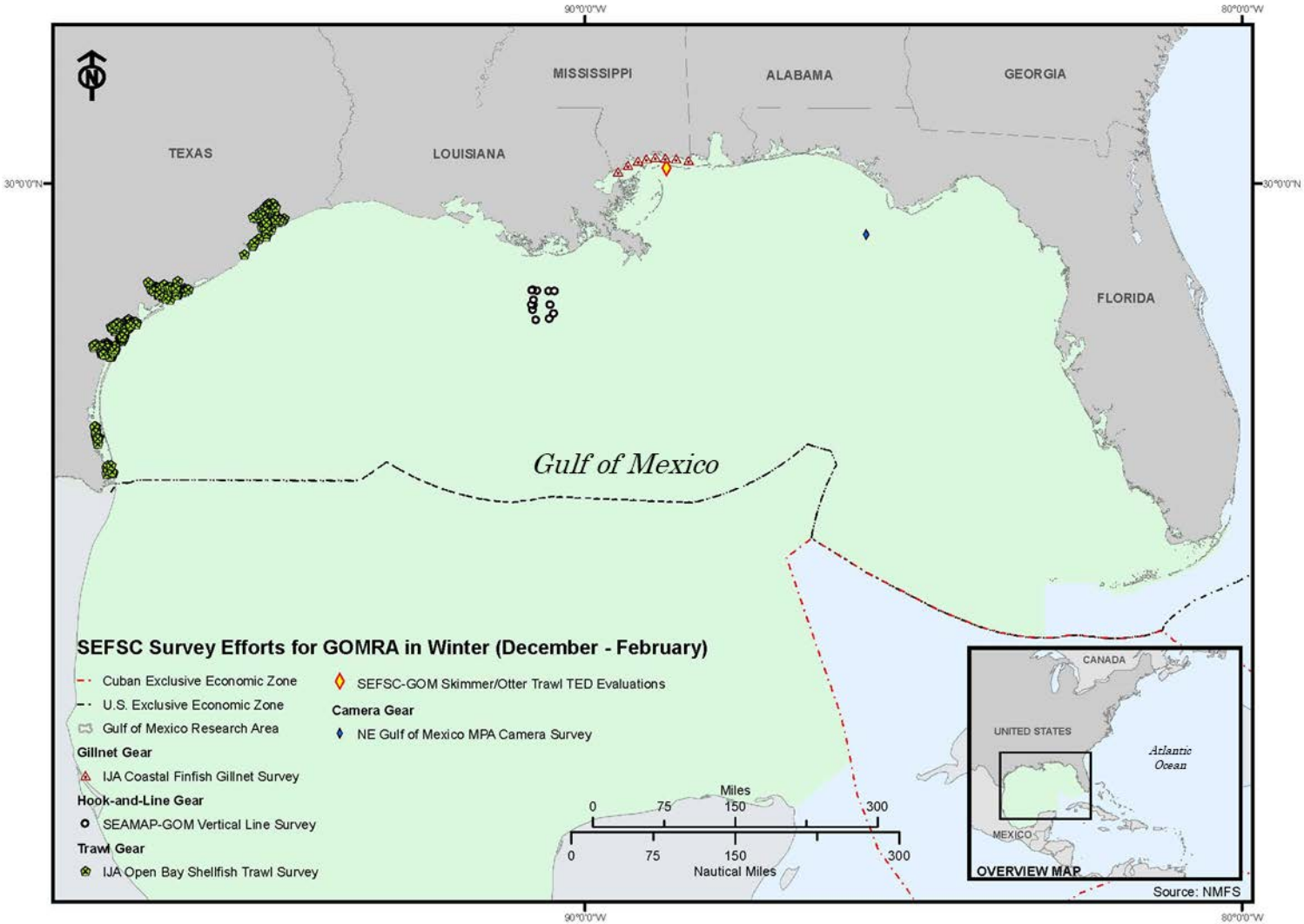
Refer back to Table B-1, Summer (June-August)

Figure 3 Distribution of SEFSC research effort in the Gulf of Mexico Research Area in fall



Refer back to Table B-1, Fall (September-November)

Figure 4 Distribution of SEFSC research effort in the Gulf of Mexico Research Area in winter



Refer back to Table B-1, Winter (December-February)

Table B-2 SEFSC Research Effort by Gear Type in the Atlantic Research Area by Season

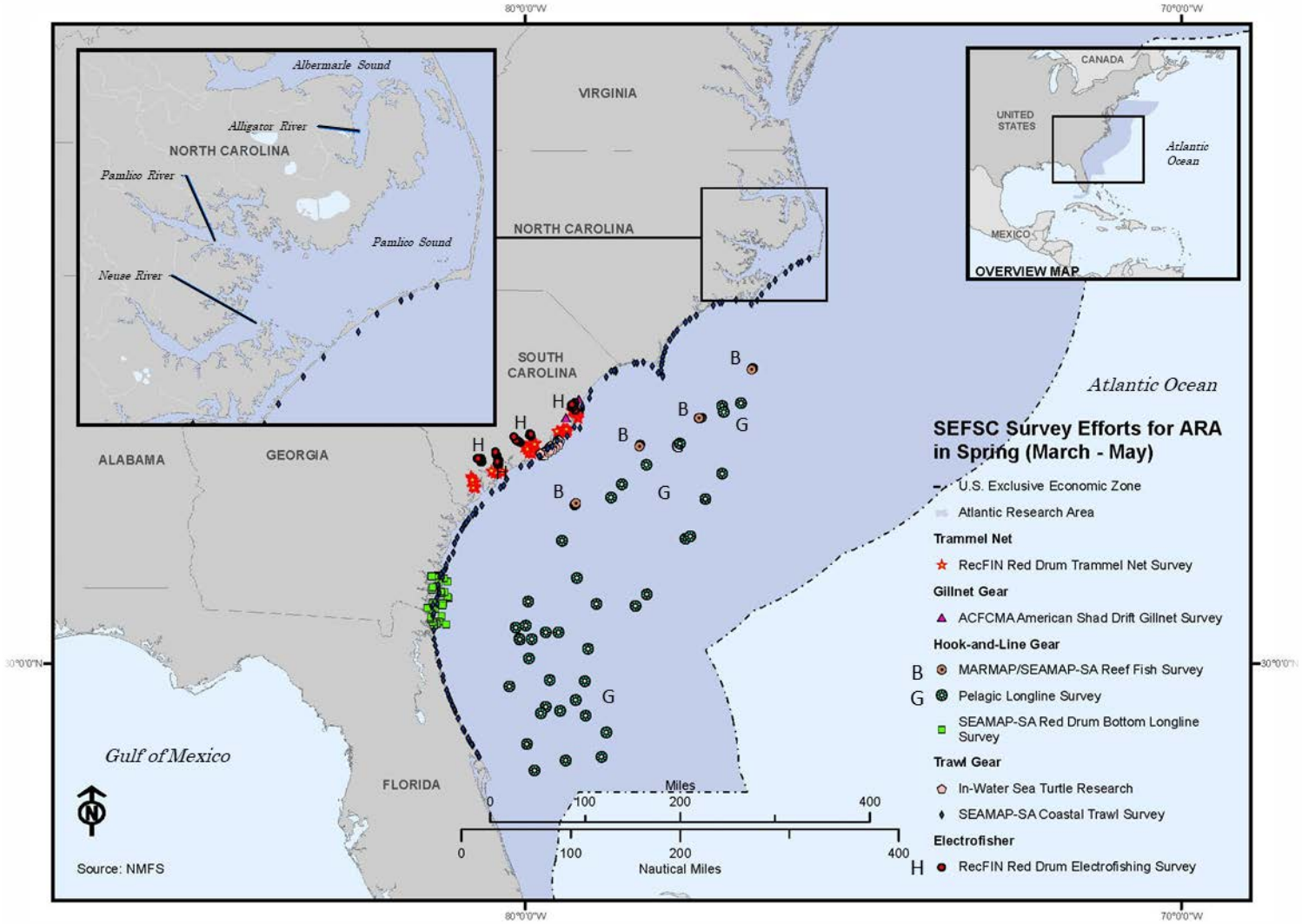
Gear type	Surveys	Gear Description	Sampling Events	Effort
Atlantic Research Area				
Spring (March-May) [map in Figure 5]				
Bandit reel	Marine Resources Monitoring, Assessment, and Prediction (MARMAP)/ SEAMAP South Atlantic Reef Fish Survey	2/0-5/0 or 9/0 J-hooks	57 sets	20 gangions/set, 1-10 min soak
Bottom longline	MARMAP/SEAMAP South Atlantic Reef Fish Survey	84 ft mainline, 14/0 circle hooks	57 sets	20 gangions/set, 90 min soak
	SEAMAP – South Atlantic Red Drum Bottom Longline Survey	2,025-4,490 ft mainline, 15/0 circle hooks	44-61 sets	60 hooks/set, 30 min soak
Chevron fish trap	MARMAP/SEAMAP South Atlantic Reef Fish Survey	1.7 m x 1.5 m x 0.6 m trap	343 sets	90 min soak
CTD profiler and/or rosette water sampler	Pelagic Longline Survey	Tow speed 0 kts	25-33 casts	Duration 10-20 min
	MARMAP/SEAMAP South Atlantic Reef Fish Survey	Tow speed 0 kts	86 casts	Duration 5-15 min
	SEAMAP-SA South Atlantic Coastal Trawl Survey	Tow speed 0 kts	100-115 casts	Duration ~2 min
Falcon bottom trawl	SEAMAP- SA South Atlantic Coastal Trawl Survey	75-ft paired mongoose-type Falcon bottom trawl	102-112 trawls	Duration 20 min
Gillnet	ACFCMA American Shad Drift Gillnet Survey	< 450 ft long, 5 in mesh	60 sets	Depth 22 ft
Pelagic longline	Pelagic Longline Survey	5 nm mainline, 18/0 offset circle hooks, 50 bullet floats	25-33 sets	100 gangions/set, 3 hr soak
Shrimp trawl	In-Water Sea Turtle Research (SCDNR)	Paired 60 ft flat net bottom trawls	~30-40 trawls (most of 400-450 trawls done in summer)	Duration 30 min, tow speed 2.8 kts

Gear type	Surveys	Gear Description	Sampling Events	Effort
Trammel net	Recreational Fisheries Information Network (RecFIN) Red Drum Trammel Net Survey	183 m x 2.1 m net	250 sets	Duration 10 min
Summer (June-August) [map in Figure 6]				
Bandit reel	MARMAP/SEAMAP South Atlantic Reef Fish Survey	2/0-5/0 or 9/0 J-hooks	114 sets	20 gangions /set, 1-10 min soak
Bottom longline	Shark and Red Snapper Bottom Longline Survey	1 nm mainline, 15/0 circle hooks	120-140 sets	100 gangions/set, 1 hr soak
	MARMAP Reef Fish Bottom Longline Survey	5,5000 ft mainline, 14/0 circle hooks	40 sets	100 gangions/set, 90 min soak
	MARMAP/SEAMAP South Atlantic Reef Fish Survey	84 ft mainline, 14/0 circle hooks	114 sets	20 gangions/set, 90 min soak
	SEAMAP–SA Red Drum Bottom Longline Survey	2,025-4,490 ft mainline, 15/0 circle hooks	NC: 75-100 sets SC: 144 sets GA: 100-137 sets	30 min soak NC: 100 hooks/set SC: 40 hooks/set GA: 60 hooks/set
Chevron fish trap	MARMAP/SEAMAP South Atlantic Reef Fish Survey	1.7 m x 1.5 m x 0.6 m trap	686 sets	90 min soak
CTD profiler and/or rosette water sampler	MARMAP Reef Fish Bottom Longline Survey	Tow speed 0 kts	40 casts	Duration 5-15 min
	Shark and Red Snapper Bottom Longline Survey	Tow speed 0 kts	120-140 casts	Duration 5-15 min
	MARMAP/SEAMAP South Atlantic Reef Fish Survey	Tow speed 0 kts	171 casts	Duration 5-15 min
	SEAMAP-SA South Atlantic Coastal Trawl Survey	Tow speed 0 kts	100-115 casts	Duration ~2 min

Gear type	Surveys	Gear Description	Sampling Events	Effort
Falcon bottom trawl	SEAMAP-SA North Carolina Pamlico Sound Trawl Survey	75-ft paired mongoose-type Falcon bottom trawl	54 trawls	Duration 30 min
	SEAMAP-SA South Atlantic Coastal Trawl Survey	75-ft paired mongoose-type Falcon bottom trawl	102-112 trawls	Duration 20 min
Shrimp trawl	In-Water Sea Turtle Research (SCDNR)	Paired 60 ft flat net bottom trawls	~370-420 trawls (some trawls done in spring)	Duration 30 min, tow speed 2.8 kts
Trammel net	RecFIN Red Drum Trammel Net Survey	183 m x 2.1 m net	333 sets	Duration 10 min
Fall (September-November) [map in Figure 7]				
Bandit reel	MARMAP/SEAMAP South Atlantic Reef Fish Survey	2/0-5/0 or 9/0 J-hooks	29 sets	20 gangions /set, 1-10 min soak
Bottom longline	MARMAP Reef Fish Bottom Longline Survey	5,5000 ft mainline, 14/0 circle hooks	20 sets	100 gangions/set, 90 min soak
	MARMAP/SEAMAP South Atlantic Reef Fish Survey	84 ft mainline, 14/0 circle hooks	29 sets	20 gangions/set, 90 min soak
	SEAMAP – South Atlantic Red Drum Bottom Longline Survey	2,025-4,490 ft mainline, 15/0 circle hooks	144 sets in SC 50-68 sets in GA	30 min soak 40 hooks/set in SC 60 hooks/set in GA
Chevron fish trap	MARMAP/SEAMAP South Atlantic Reef Fish Survey	1.7 m x 1.5 m x 0.6 m trap	171 sets	90 min soak
CTD profiler and/or rosette water sampler	MARMAP Reef Fish Bottom Longline Survey	Tow speed 0 kts	20 casts	Duration 5-15 min
	MARMAP/SEAMAP South Atlantic Reef Fish Survey	Tow speed 0 kts	43 casts	Duration 5-15 min
	SEAMAP-SA South Atlantic Coastal Trawl Survey	Tow speed 0 kts	100-115 casts	Duration ~2 min

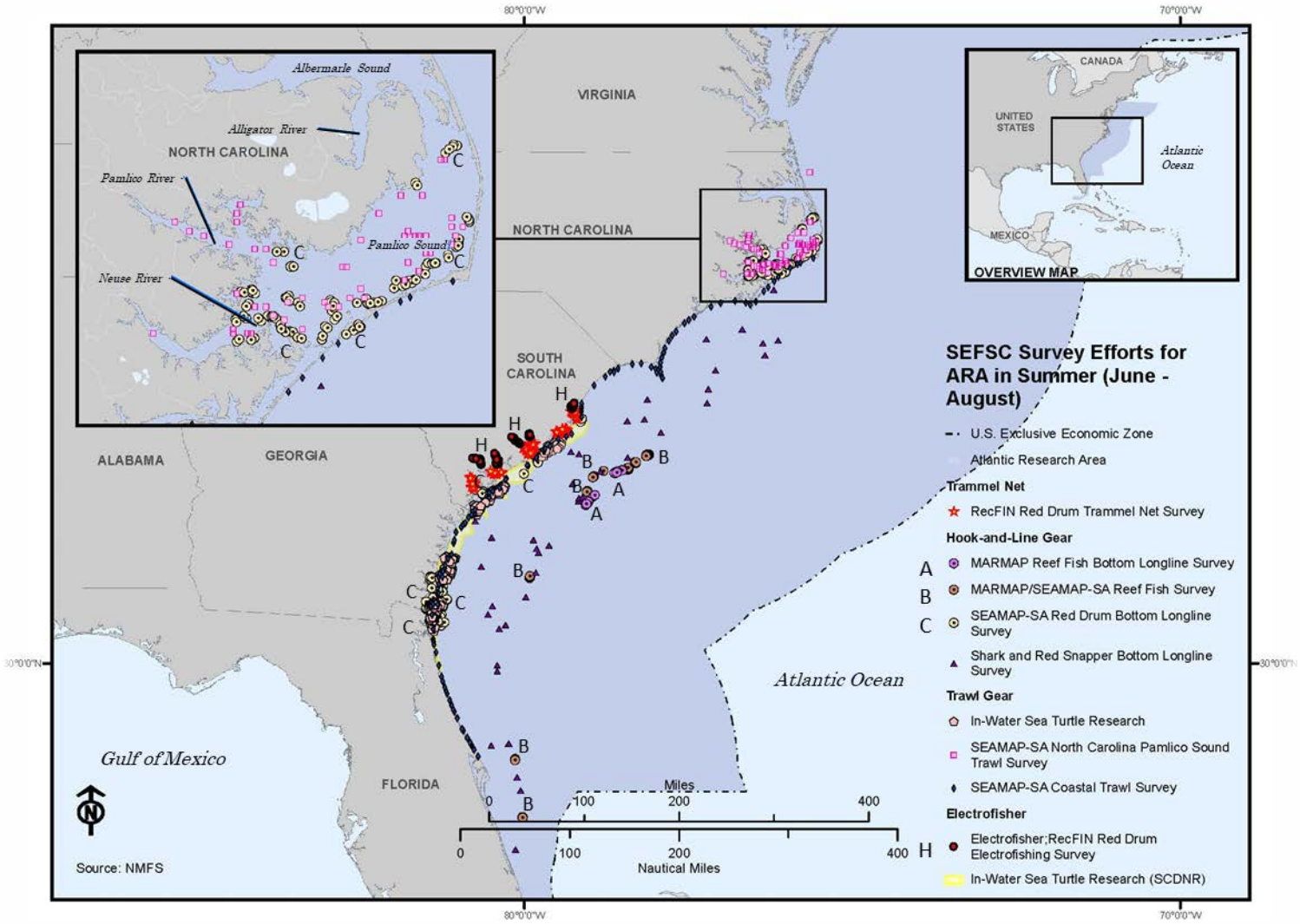
Gear type	Surveys	Gear Description	Sampling Events	Effort
Falcon bottom trawl	SEAMAP-SA North Carolina Pamlico Sound Trawl Survey	75-ft paired mongoose-type Falcon bottom trawl	54 trawls	Duration 30 min
	SEAMAP-SA South Atlantic Coastal Trawl Survey	75-ft paired mongoose-type Falcon bottom trawl	102-112 trawls	Duration 20 min
Trammel net	RecFIN Red Drum Trammel Net Survey	183 m x 2.1 m net	167 sets	Duration 10 min
Winter (December-February) [map in Figure 8]				
Bottom longline	SEAMAP–SA Red Drum Bottom Longline Survey	2,025-4,490 ft mainline, 15/0 circle hooks	72 sets in SC 25-35 sets in GA	30 min soak 40 hooks/set in SC 60 hooks/set in GA
CTD profiler and/or rosette water sampler	Pelagic Longline Survey	Tow speed 0 kts	25-33 casts	Duration 10-20 min
Gillnet	ACFCMA American Shad Drift Gillnet Survey	< 450 ft long, 5 in mesh	60 sets	22 ft depth
High-opening bottom trawl	Atlantic Striped Bass Tagging Bottom Trawl Survey	65 ft net	350 trawls	Duration 30 min
Pelagic longline	Pelagic Longline Survey	5 nm mainline, 18/0 offset circle hooks, 50 bullet floats	25-33 sets	100 gangions/set, 3 hr soak
Trammel net	RecFIN Red Drum Trammel Net Survey	183 m x 2.1 m net	250 sets	Duration 10 min

Figure 5 Distribution of SEFSC research effort in the Atlantic Research Area in spring



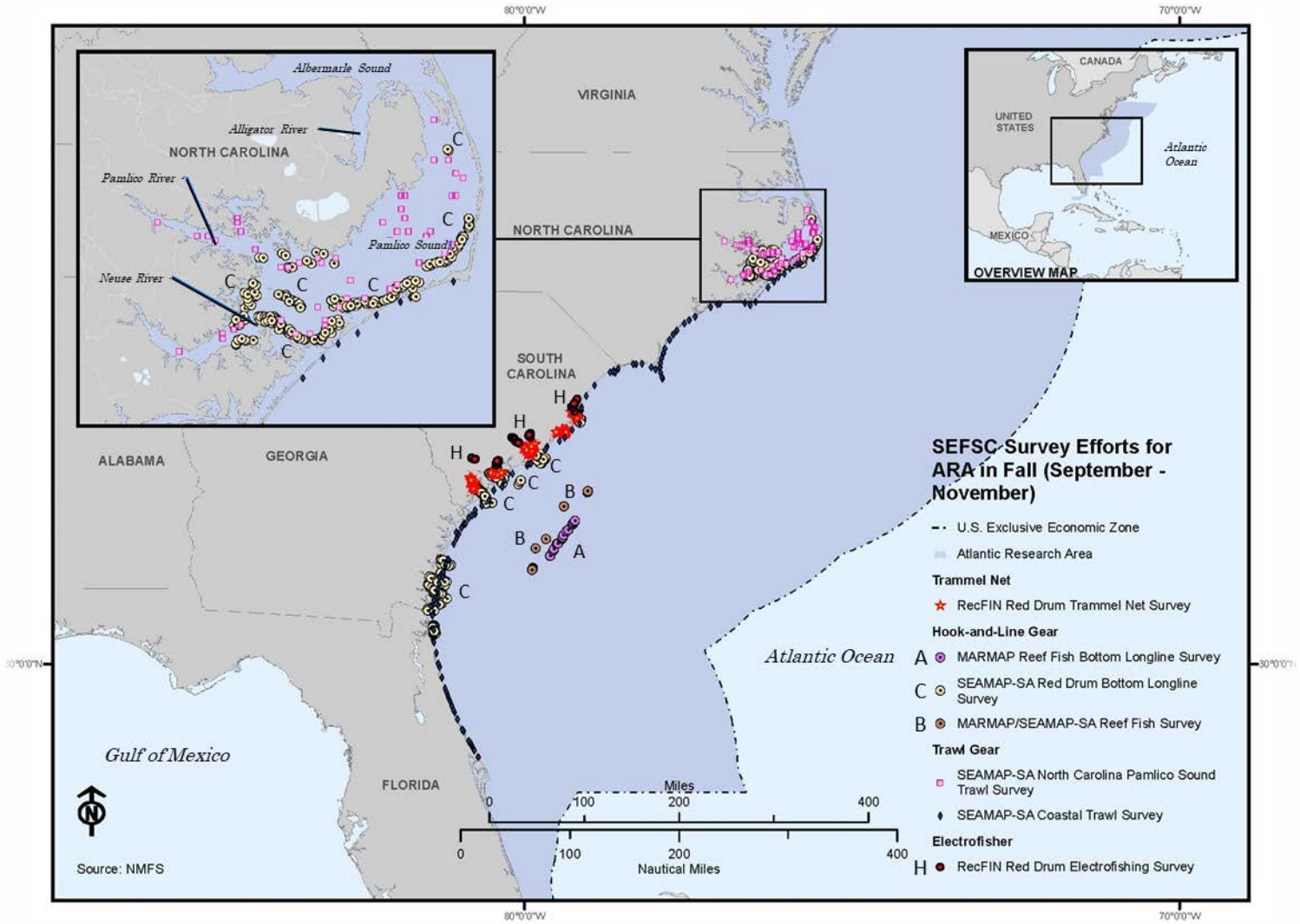
Refer back to Table B-2, Spring (March-May)

Figure 6 Distribution of SEFSC research effort in the Atlantic Research Area in summer



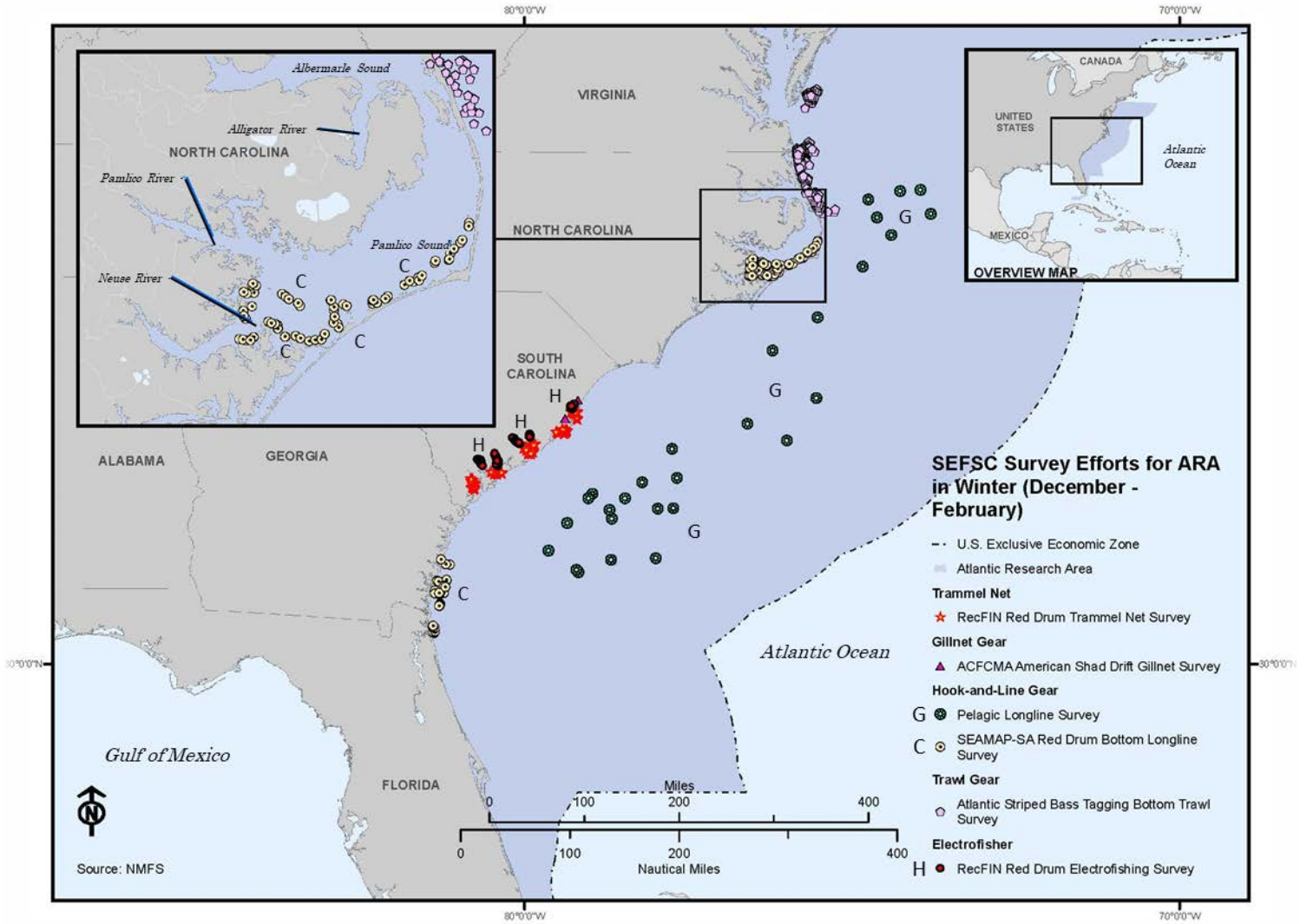
Refer back to Table B-2, Summer (June-August)

Figure 7 Distribution of SEFSC research effort in the Atlantic Research Area in fall



Refer back to Table B-2, Fall (September-November)

Figure 8 Distribution of SEFSC research effort in the Atlantic Research Area in winter

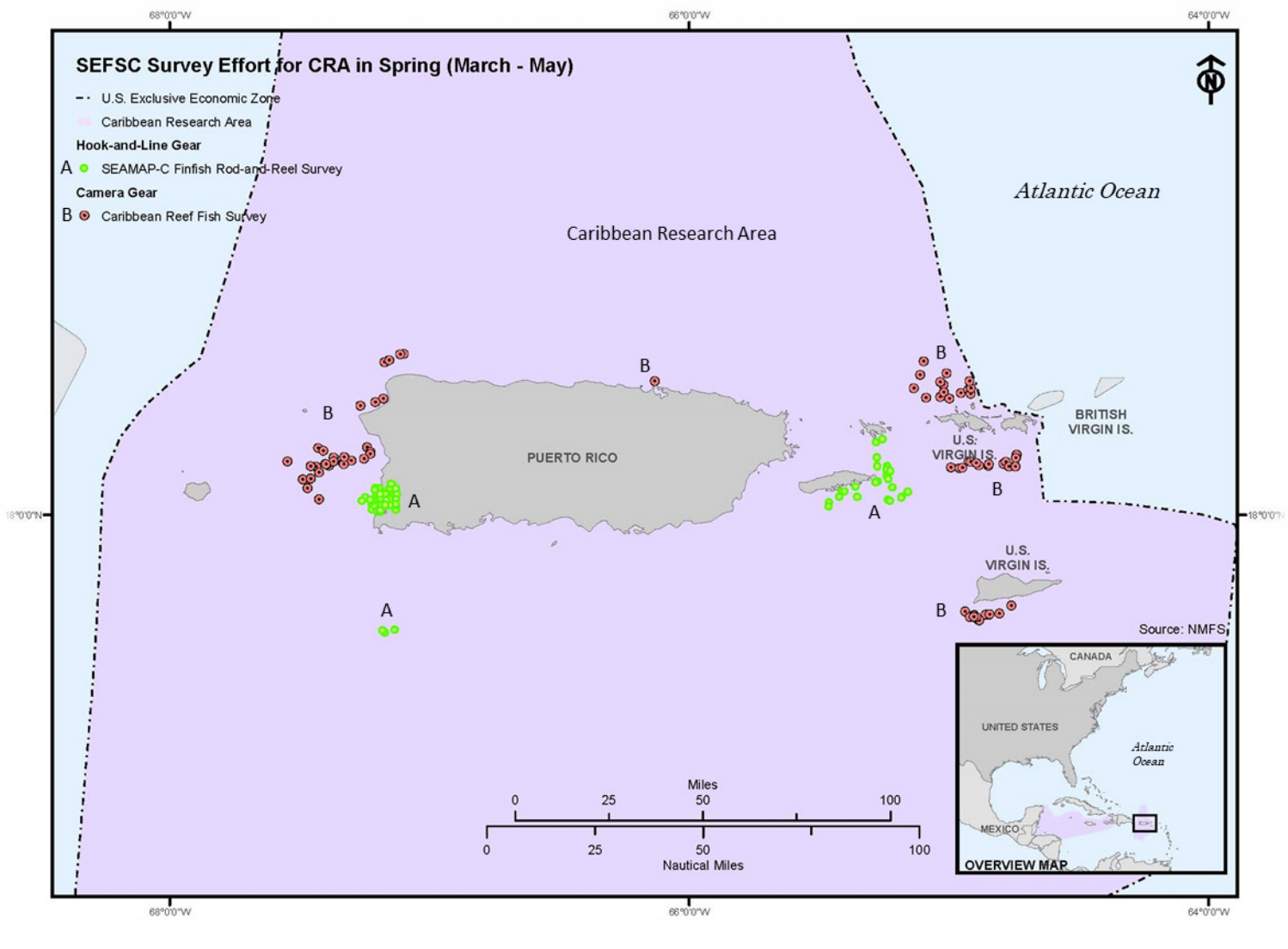


Refer back to Table B-2, Winter (December-February)

Table B-3 SEFSC Research Effort by Gear Type in the Caribbean Research Area by Season

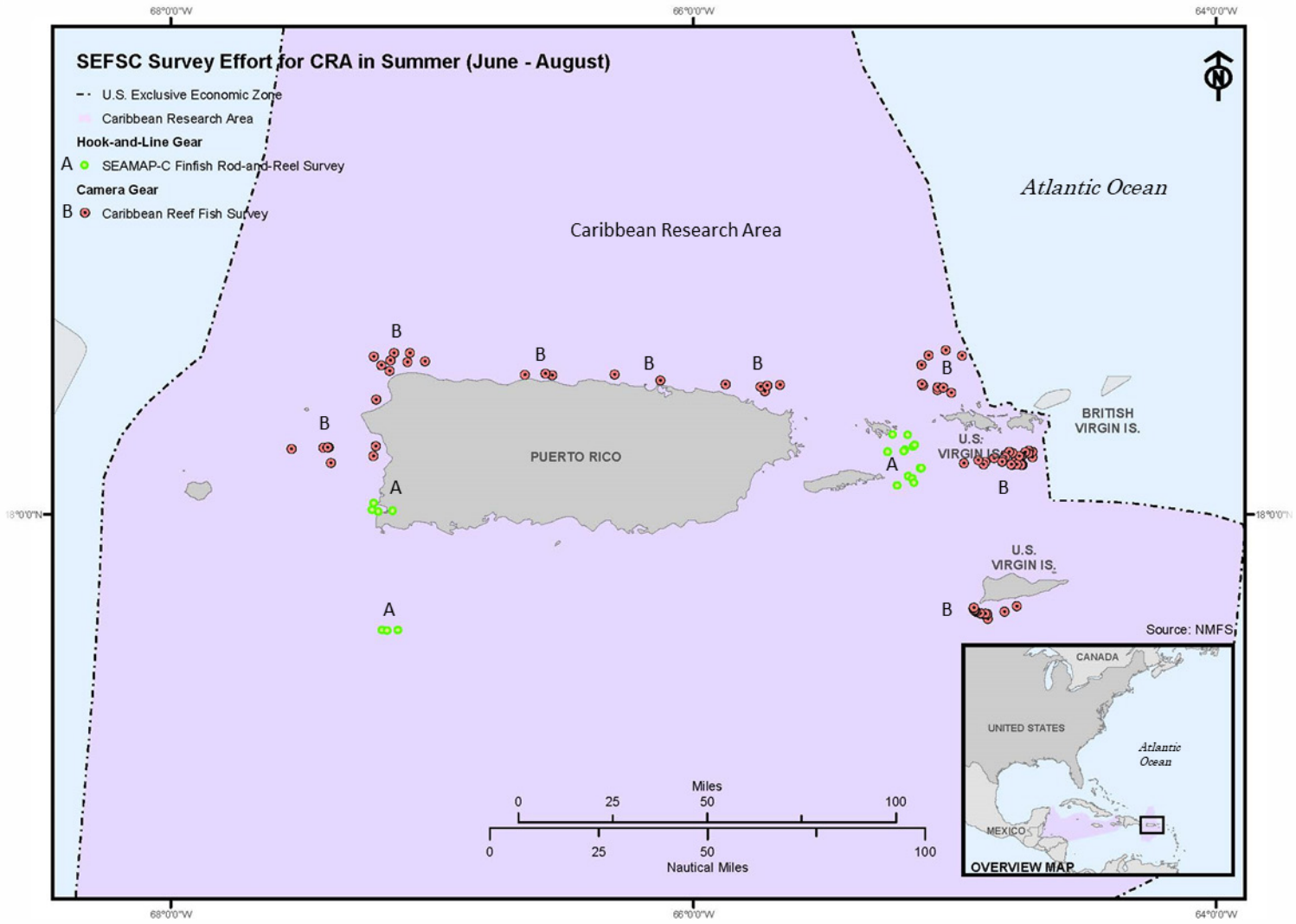
Gear type	Surveys	Gear Description	Sampling Events	Effort
Caribbean Research Area				
Spring (March-May) [map in Figure 9]				
Bandit reel	Caribbean Reef Fish Survey	8/0 or 11/0 circle hooks	225 sets	10 gangions/set, 5-10 min soak
Chevron fish trap	Caribbean Reef Fish Survey	6 m x 6 m trap	75 sets	1 hr soak
CTD profiler and/or rosette water sampler	Caribbean Reef Fish Survey	Tow speed 0 kts	225 casts	Duration 5-15 min
Hook and line	SEAMAP-Caribbean (C) Finfish Rod-and-Reel Survey	#6 Mustad, 80 lb test monofilament	30 stations	3 lines with 3 hooks per line at each station, 4 hr soak
Summer (June-August) [map in Figure 10]				
Bandit reel	Caribbean Reef Fish Survey	8/0 or 11/0 circle hooks	75 sets	10 gangions/set, 5-10 min soak
Chevron fish trap	Caribbean Reef Fish Survey	6 m x 6 m trap	25 sets	1 hr soak
CTD profiler and/or rosette water sampler	Caribbean Reef Fish Survey	Tow speed 0 kts	225 casts	Duration 5-15 min
Hook and line	SEAMAP-C Finfish Rod-and-Reel Survey	#6 Mustad, 80 lb test monofilament	40 stations	3 lines with 3 hooks per line at each station, 4 hr soak
Fall (September-November) [map in Figure 11]				
Hook and line	SEAMAP-C Finfish Rod-and-Reel Survey	#6 Mustad, 80 lb test monofilament	20 stations	3 lines with 3 hooks per line at each station, 4 hr soak
Winter (December-February) [map in Figure 12]				
Hook and line	SEAMAP-C Finfish Rod-and-Reel Survey	#6 Mustad, 80 lb test monofilament	30 stations	3 lines with 3 hooks per line at each station, 4 hr soak

Figure 9 Distribution of SEFSC research effort in the Caribbean Research Area in spring



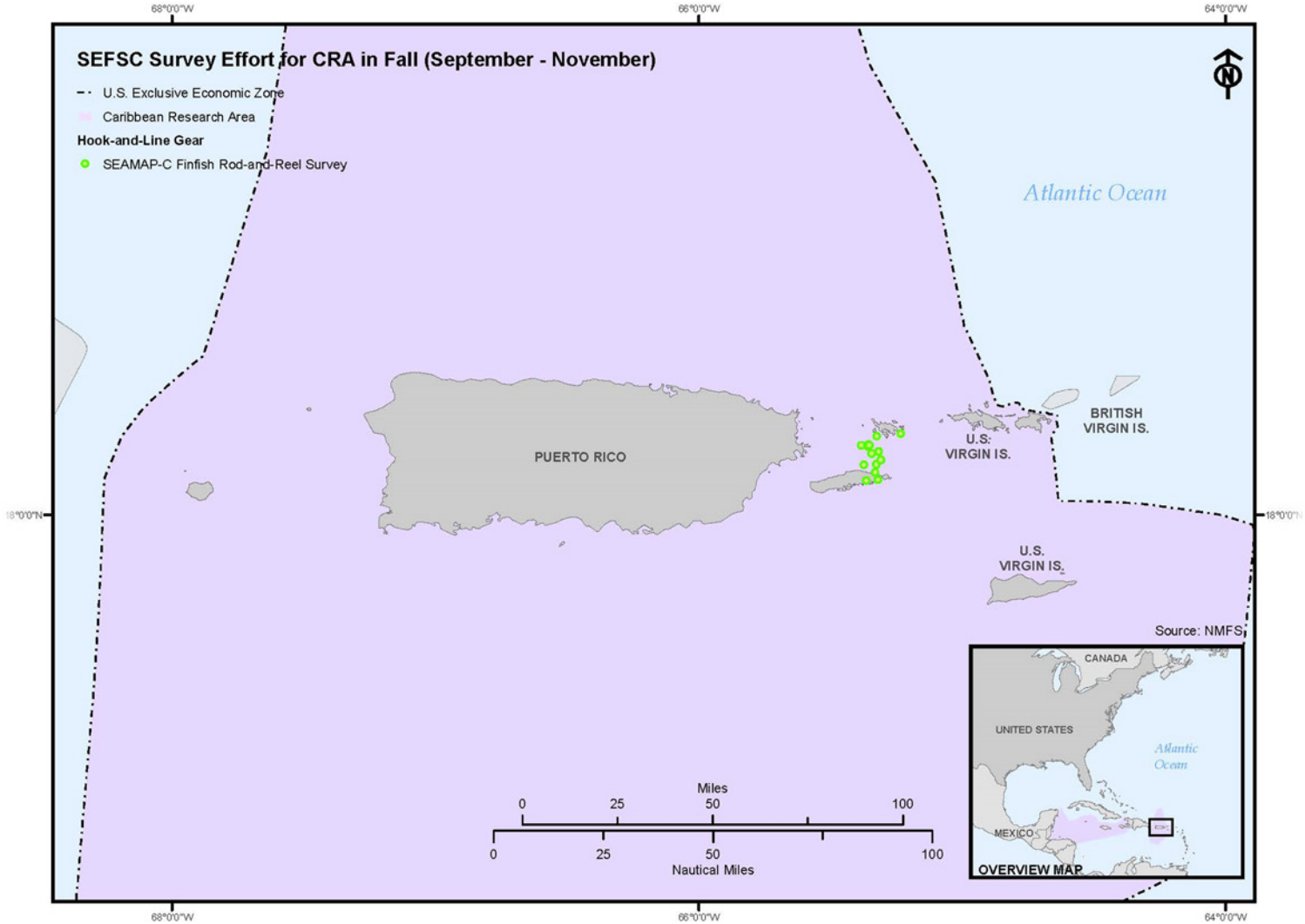
Refer back to Table B-3, Spring (March-May)

Figure 10 Distribution of SEFSC research effort in the Caribbean Research Area in summer



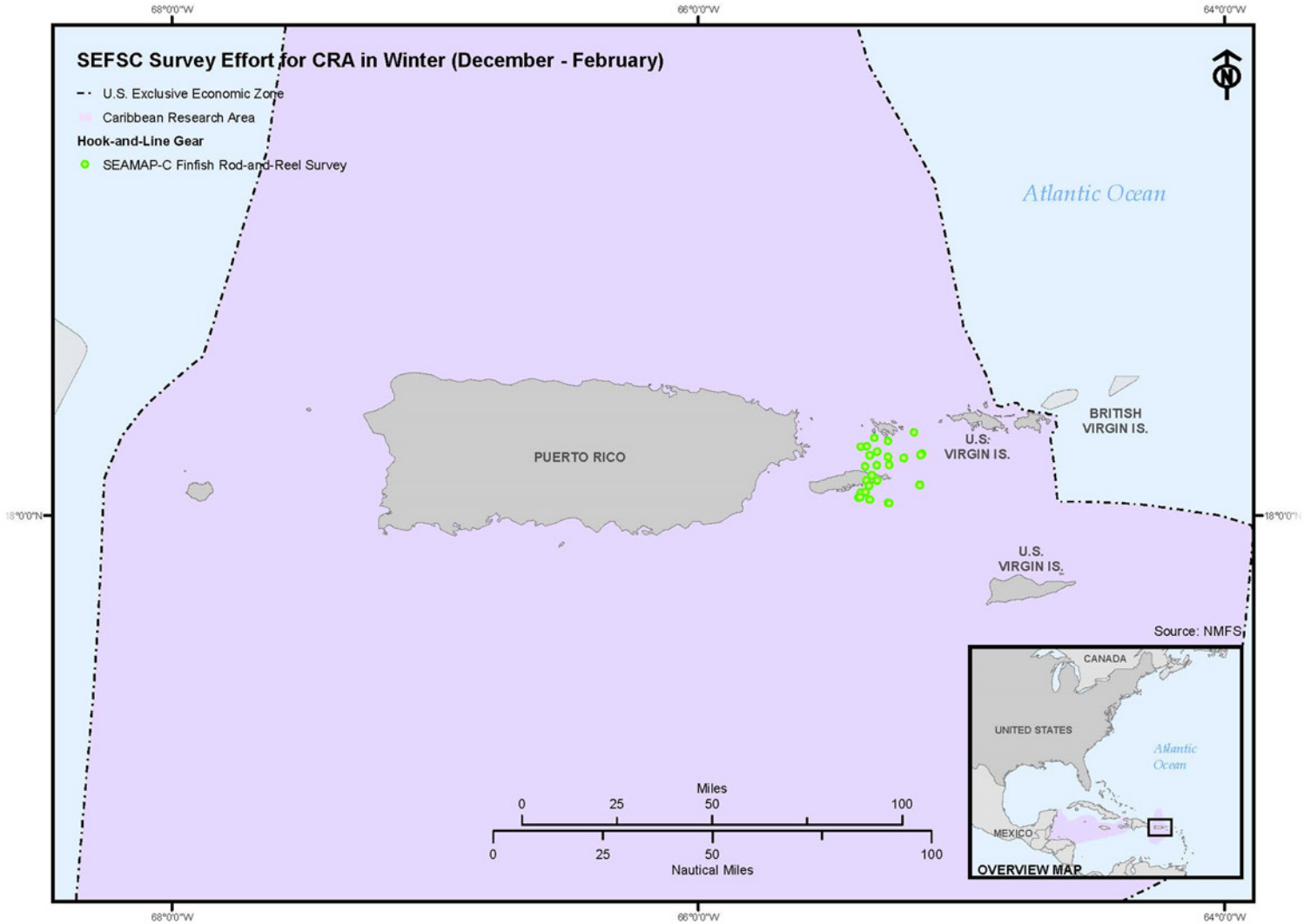
Refer back to Table B-3, Summer (June-August)

Figure 11 Distribution of SEFSC research effort in the Caribbean Research Area in fall



Refer back to Table B-3, Fall (September-November)

Figure 12 Distribution of SEFSC research effort in the Caribbean Research Area in winter



Refer back to Table B-3, Winter (December-February)

FINAL
Programmatic Environmental Assessment

for

Fisheries and Ecosystem Research Conducted and Funded

by the

Southeast Fisheries Science Center

March 2020

Appendix C

Southeast Fisheries Science Center Protected Species Handling, Data Collection, and Reporting Procedures

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1. **Table 1: Protected Species Designated Contacts**
2. **Incidental Take Response, Handling, and Reporting Procedures for Sea Turtles**
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    b. Sea turtle handling release guidelines; gillnet placard
    c. Sea turtle resuscitation guidelines placard
3. **Incidental Take Response, Handling, and Reporting Procedures for ESA-listed Fish**
    a. Sawfish handling and release guidelines
    b. Smalltooth sawfish management information
    c. Protected sturgeon of the U.S. Atlantic and Gulf of Mexico
    d. Atlantic sturgeon safe handling and release guidelines
    e. A Protocol for Use of Shortnose, Atlantic, Gulf, and Green Sturgeons (NOAA Technical Memorandum NMFS-OPR-45, pages 12-19)
4. **Incidental Take Response, Handling, and Reporting Procedures for Marine Mammals**
    a. Procedures and actions for incidental takes of marine mammals in research and monitoring activities
    b. Atlantic pelagic longline placard for handling and release of marine mammals
    c. Right whale or other large whale vessel strike reporting form
    d. Compliance guide for right whale ship strike reduction rules (50 CF224.105)
    e. Identification guide for bottlenose and Atlantic spotted dolphins
5. **Southeast Region Protected Species Incidental Take Reporting Form Instructions**
6. **Southeast Region Protected Species Incidental Take Reporting Form**

Table 1. Protected Resources Designated Contacts.

Species	Contact Name	Address	Phone Number	Email	Samples/Carcass
Sea Turtles	Gabriela Serra-Valente	NOAA/NMFS/SWFSC 8901 La Jolla Shores Drive La Jolla, CA 92037	(858) 546-5697	Gabriela.Serra-Valente@noaa.gov	Tissue/Genetic samples
Sea Turtles	Dr. Brian Stacy	NOAA/NMFS and University of Florida 2187 Mowry Road, Building 471 Gainesville, FL 32611	(352) 283-3370	Brian.Stacy@noaa.gov	Carcasses
Smalltooth Sawfish **FFWCC researchers/ participants*	Dr. Gregg Poulakis	Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Charlotte Harbor Field Laboratory 585 Prineville Street Port Charlotte, FL 33954-1006	(941) 613-0948	Gregg.poulakis@fwc.state.fl.us	Samples/parts/carcasses collected by FFWCC only
Smalltooth Sawfish ***All other* researchers	Dr. John Carlson	NOAA/NMFS Panama City Laboratory 3500 Delwood Beach Road Panama City, FL 32408	(850) 234-6541	John.carlson@noaa.gov	Samples/parts/carcasses collected by all others
Gulf Sturgeon	Dr. John Carlson	See above	See above	See above	Carcasses
Gulf Sturgeon	Dr. Brian Kreiser	Department of Biological Sciences 118 College Drive Ste.5018 University of Southern Mississippi Hattiesburg, MS 39406	(601) 266-6556	Brian.Kreiser@usm.edu	Tissue/Genetic samples
Atlantic Sturgeon & Shortnose Sturgeon	Dr. Tim King	U.S. Geological Survey Leetown Science Center Aquatic Ecology Branch 11649 Leetown Road Kearneysville, WV 25430	(304) 724-4450	tlking@usgs.gov	Tissue/Genetic samples
Marine Mammals	NOAA Fisheries Marine Mammal Stranding Hotline	Stranding Hotline will direct you to the nearest Stranding Network	877-433-8299		Carcasses/Tissue samples

Incidental Take Response, Handling and Reporting Procedures for Sea Turtles

1. **Live Entanglements/Hookings/Trawl Captures:**

    a. Upon sighting an entangled or hooked sea turtle, slow the vessel and move in the direction of the sea turtle. Once the animal is alongside the vessel, place the vessel's engines in neutral. Minimize tension on the line and avoid pulling up the sea turtle by the gear.

    b. Do not use gaffs or other sharp objects to retrieve or control the sea turtle, although a gaff may be used to control the line.

    c. When boating the sea turtle, take care not to drop the sea turtle onto the deck or allow it to slam into the side of the vessel. If the sea turtle requires resuscitation, follow the Sea Turtle Resuscitation Guidelines (NOAA Technical Memorandum NMFS-SEFSC-580, Plate 3-1. Available at: http://www.sefsc.noaa.gov/turtles/TM_NMFS_SEFSC_580.pdf).

    d. All researchers should handle incidentally captured sea turtles in a manner consistent with those described in NOAA's Careful Release Protocols for Sea Turtle Release with Minimal Injury (NOAA Technical Memorandum NMFS-SEFSC-580) to remove as much gear from the animal as possible.

    e. If can be done so, immediately without further harming the animal, photograph the hooking/entanglement location prior to gear removal.

    f. If the animal is seriously injured, and could feasibly be returned to shore, call 1-877-942-5343 to coordinate with local sea turtle stranding responders.

    g. Remove all externally embedded hooks. **If the hook cannot be removed, removing as much line as possible should be the highest priority.** If unsure whether hook removal will cause injury to the sea turtle, do not remove the hook.

    h. The easiest way to remove a hook may be to cut off the eye or barb so that the hook can be pushed through or backed out without causing further injury to the sea turtle. If the hook is visible and accessible, but cannot be removed, bolt cutters should be used to cut off as much of the hook as possible. If the hook cannot be cut or removed, cut the line close to the eye of the hook, removing all line if possible.

    i. Only remove ingested hooks if the insertion point of the barb is clearly visible, and exercise extreme caution during hook removal. Never remove a hook that has been swallowed and the hook insertion point is not visible.

    j. Once gear is removed, please photograph the head, carapace, and plastron of all boated sea turtles. Record the information specified on the Protected Species Incidental Take Form and report the encounter within 24 hrs. If research is under a federal research permit, follow reporting requirements described in that permit as well.

    k. Researchers that have been properly trained by a ESA Section 10(a)(1)(A) permit holder for sea turtles should also follow the sea turtle handling and sampling instructions found in the SEFSC Sea Turtle Research Techniques Manual (NOAA Technical Memorandum NMFS-SEFSC-579; http://www.sefsc.noaa.gov/turtles/TM_579_SEFSC_STRTM.pdf) to check the animal for flipper tags, scan for PIT tags, record the information specified on

the Protected Species Incidental Take Form, tag untagged sea turtles and collect tissue samples (skin biopsy).

l. Release the animal by lowering it over the aft portion of the vessel, close to the water's surface. Make sure fishing gear is not in use and the engines are in neutral. Release the turtle in an area where it is unlikely to be recaptured or injured by vessels.

2. In Case of Sea Turtle Mortality:

a. If a sea turtle is dead or fails to respond to resuscitation attempts, the carcass can be retained and returned to shore. First scan the carcass for PIT tags and flipper tags, remove tissue samples (skin biopsy), and photograph the animal. The remaining specimen(s) or body parts should be preserved (iced/refrigerated or frozen if ice/refrigeration not possible) until additional sampling and disposal procedures are discussed with the designated NMFS contact (see Table 1). If it is not possible to retain the carcass, mark the carcass (spray paint and flipper tag), if possible, and discard carcass near original site of capture in the same manner as that of actively moving sea turtles. Report the encounter to HMS within 24 hrs.

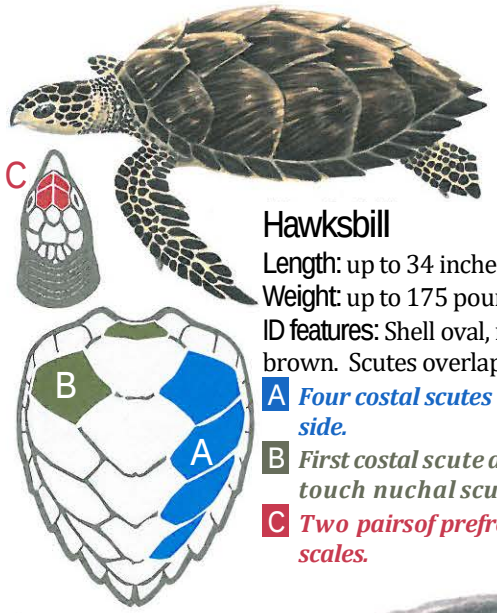
3. Reporting:

a. For entanglements/captures/hookings, please fill out the NOAA Fisheries Southeast Region Protected Species Reporting Form within 24 hours of the incidental take and submit to nmfs.ser.ea_loa.takereport@noaa.gov. Please enter Fisheries Independent Monitoring Protected Species Take (BiOp SER-2009-7541) in the subject line and include the project name and species in the text of the email.

SEA TURTLES OF THE UNITED STATES ATLANTIC COAST

Text color and letter key correspond to identification feature in diagram.

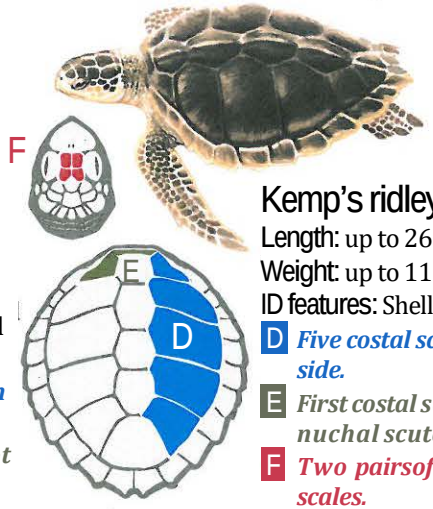
3 Feet



Hawksbill

Length: up to 34 inches
Weight: up to 175 pounds
ID features: Shell oval, mottled brown. Scutes overlapping.

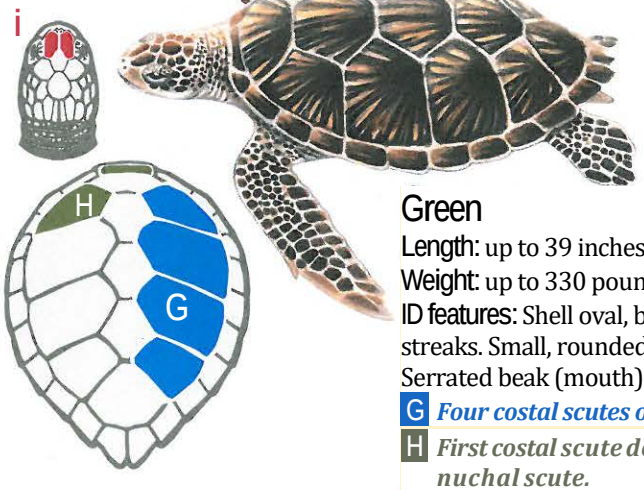
- A *Four costal scutes on each side.*
- B *First costal scute does not touch nuchal scute.*
- C *Two pairs of prefrontal scales.*



Kemp's ridley

Length: up to 26 inches
Weight: up to 110 pounds
ID features: Shell round, gray.

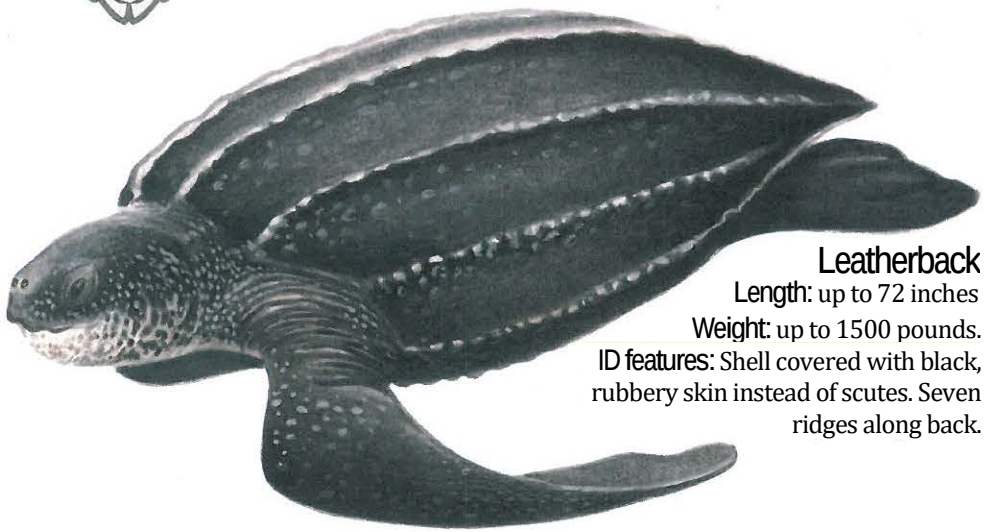
- D *Five costal scutes on each side.*
- E *First costal scute touches nuchal scute.*
- F *Two pairs of prefrontal scales.*



Green

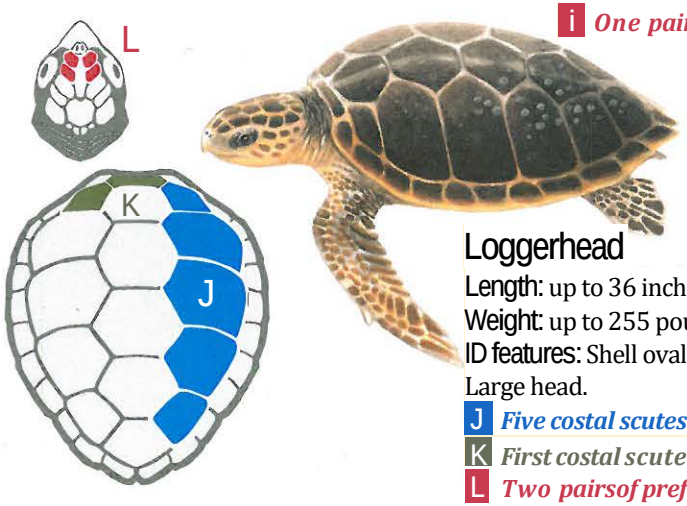
Length: up to 39 inches
Weight: up to 330 pounds
ID features: Shell oval, brown with streaks. Small, rounded head. Serrated beak (mouth) edges.

- G *Four costal scutes on each side.*
- H *First costal scute does not touch nuchal scute.*
- i *One pair of prefrontal scales.*



Leatherback

Length: up to 72 inches
Weight: up to 1500 pounds.
ID features: Shell covered with black, rubbery skin instead of scutes. Seven ridges along back.



Loggerhead

Length: up to 36 inches
Weight: up to 255 pounds
ID features: Shell oval, reddish-brown. Large head.

- J *Five costal scutes on each side.*
- K *First costal scute touches nuchal scute*
- L *Two pairs of prefrontal scales.*

National Marine Fisheries Service Northeast Region Protected Resources Division
978-281-9328 • www.nero.noaa.gov/prot_res
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Sea Turtle Identification Key

Hard carapace (shell) with large scutes (shell plates)

Leathery, no scutes; Longitudinal dorsal ridges

Leatherback
Dermochelys coriacea
Carapace: dark gray/black with white spots; Plastron: white with dark blotches

Two pairs prefrontal scales

One pair prefrontal scales; serrated lower jaw

Usually 5 or more costal (lateral) scutes; first costal scute touches nuchal

Usually 4 costal (lateral) scutes; first costal scute does not touch nuchal

Usually 4 costal (lateral) scutes; first costal scute does not touch nuchal; usuallly 4 inframarginal scutes without pores

Usually 4 inframarginal scutes with pores

Usually 3 inframarginal scutes without pores

Usually 4 inframarginal scutes without pores

Usually 6 or more costal scutes

Usually 5 costal scutes

ocular scales

No preocular scales

Green
Chelonia mydas
Carapace: brown with radiating streaks; Plastron: white to yellow

Black
Chelonia mydas
Carapace: black or gray with black markings; Plastron: gray

Flatback
Natator depressus
Carapace: olive gray; carapace has upturned on adults; Plastron: yellow

Hawksbill
Eretmochelys imbricata
Carapace: tan, brown and black with random streaks; overlapping scutes; Plastron: cream with dark blotches

Loggerhead
Caretta caretta
Carapace: red brown/dark brown; first costal scute is very small; Plastron: yellow/orange

Kemp's Ridley
Lepidochelys kempii
Carapace: gray to light olive green; round; Plastron: white/yellow

Olive Ridley
Lepidochelys olivacea
Carapace: gray to olive green; number of costal scutes may be asymmetrical; Plastron: white/yellow

Typical adult colors are described here; colors may differ, particularly in hatchlings and juveniles

Dorsal View (Carapace)

Ventral View (Plastron)

Sea Turtle Handling/Release Guidelines: Quick Reference for Atlantic Shark GILLNET Gear

October 2006

Guidelines for Handling Gear

- Gillnet gear should be set and/or fished to achieve maximum net **tautness**. This will prevent turtles from becoming entangled in the net in the case of an encounter.
- Scan net as far ahead as possible to sight turtles in advance and reduce the risk of jerking turtles out of the water.
- Vessel operators are required to check nets every 0.5 to 2 hours (50 CFR§ 635.21 (e) (3) (vi)).

Upon Sighting a Turtle

- **Slow vessel** and adjust direction to move towards the turtle. Once turtle is alongside, place the vessel in **neutral**.
- Slowly retrieve the net, avoiding tugging or yanking motions.
- Considering the size of the turtle, sea conditions, and safety of crew, determine whether the turtle can be boated. (All turtles should be **boated if possible**.)

Guidelines for Turtles Boated

- **Boat the turtle** using a dipnet or large turtle hoist. Avoid pulling up the turtle by the gear it is entangled in, as this could injure the animal. Gaffs may only be used to control the fishing gear, **DO NOT USE GAFFS OR SHARP OBJECTS** to retrieve the turtle.
- **Support the turtle** on a cushioned surface, such as a tire, while it is onboard.
- If the turtle cannot easily be disentangled from the net, **carefully cut the net** off the turtle. **Blunt-sided** line cutters such as first-aid clippers are preferred. If one-sided cutters/clippers are used, carefully slide the blunt end under the line or net you want to cut. Attempt to remove any lines or net attached to the turtle.
- **Identify** the species of turtle and record when and where the interaction occurred.

Guidelines for Turtles NOT Boated

- If the turtle is too large to be boated, control the turtle with a turtle tether if possible and bring the turtle close to the vessel.
- **Identify** the species of turtle and record when and where the interaction occurred.
- Try to work the turtle free from the net while the turtle is next to the boat. Use line cutters/clippers with a handle extension or first-aid clippers to cut the net off the turtle if necessary. Carefully slide the **BLUNT END** of the line cutter under the line or net you want to remove. Attempt to remove any lines or net attached to the turtle.

Guidelines for UNCONSCIOUS Turtles

- Place the turtle on its lower shell and **elevate** its hindquarters approximately 6 inches to permit the lungs to drain off water (Figure A).
- Keep the **skin and eyes moist** by covering the turtle with a moist towel or periodically spraying it with water while it is onboard. Place the turtle in the shade if necessary, while maintaining its body temperature above 60°F.
- Check for muscle **reflexes** approximately every 3 hours by touching the eyelid or tail (Figure B). An unconscious, but live turtle may or may not respond to touch.
- Be patient. Sea turtles caught and held underwater are stressed and may take some time to revive. If the turtle has shown no sign of life before returning to port, or after 24 hours on deck, it may safely be considered dead. Release the turtle in the water in a non-fishing area.

A

B

Contact Information

More information on releasing sea turtles is available on the on the web at: http://www.nmfs.noaa.gov/sfa/hms and in the publication, *Careful Release Protocols for Sea Turtle Release with Minimal Injury,* which is available on this website. Call (301) 713-2347 to obtain a copy of the report or for additional copies of this placard.

Stop!

GUIDELINES FOR RELEASING A TURTLE

(1) **STOP VESSEL** and place in **NEUTRAL**;
(2) **Ease turtle** gently into the water, head first, through cut-out door if so equipped;
(3) Observe that turtle is safely **away from the vessel** before engaging the propeller and move 1 nmi before continuing fishing operations.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION · NOAA · U.S. DEPARTMENT OF COMMERCE

Sea Turtle Resuscitation Guidelines

If a turtle appears to be unconscious or comatose, attempt to revive it before release. Turtles can withstand lengthy periods without breathing; a living comatose sea turtle may not move, breathe voluntarily, or show reflex responses or other signs of life. In other cases, a lightly comatose turtle may show shallow breathing or reflexes such as eyelid or tail movement when touched. Use the following method of resuscitation in the field if veterinary attention is not immediately available:

- **Place the turtle on its plastron (lower shell) and elevate the hindquarters approximately 15 - 30 degrees to permit the lungs to drain off water for a period of 4 up to 24 hours. A board, tire or boat cushion, etc. can be used for elevation.**

- **Periodically, rock the turtle gently left to right and right to left by holding the outer edge of the carapace and lifting one side about 3 inches, then alternate to the other side.**

- **Keep the turtle in the shade, at a temperature similar to water temperature at capture. Keep the skin (especially the eyes) moist while the turtle is on deck by covering the animal's body with a wet towel, periodically spraying it with water, or by applying petroleum jelly to its skin and carapace. Do not put the turtle into a container with water.**

- **Do not put the turtle on its carapace (top shell) and pump the plastron (breastplate) or try to compress the turtle to force water out, as this is dangerous to the turtle and may do more harm than good.**

- **Periodically, gently touch the corner of the eye or eyelid and pinch the tail near the vent (reflex tests) to monitor consciousness.**

- **Sea turtles may take some time to revive; do not give up too quickly. Turtles that are successfully resuscitated benefit from being held on deck as long as possible (up to 24 hours) to fully recover from the stress of accidental forced submergence.**

- **Release successfully resuscitated turtles over the stern of the boat, when fishing or scientific collection gear is not in use, the engine is in neutral, and in areas where they are unlikely to be recaptured or injured by vessels. A turtle that has shown no sign of life after 24 hours on deck may be considered dead and returned to the water in the same manner.**

NMFS/SEFSC Photos

References:

Federal Register, December 31, 2001. Government Printing Office, Washington DC 66 (250), pp. 67495- 67496.

July 2009

Incidental Take Response, Handling and Reporting Procedures for ESA-listed Fish

1. **Live Entanglements/Hookings/Trawl Captures – Smalltooth Sawfish:**

    a. Leave the sawfish, especially the gills, in the water as much as possible.

    b. Do not remove the saw (rostrum) or injure the animal in any way.

    c. Remove as much fishing gear as safely possible from the body of the animal.

    d. If can be done safely, untangle any net or line from the animal's rostrum. Remove gear with a boat hook or line-cutting pole. To remove gear tangled around the rostrum, cut the gear along the lateral edge of the rostrum. Once gear is cut, work it free with a boat hook or linecutting pole.

    e. If can be done without further harming the animal, photograph the hooking/entanglement location prior to release. Take multiple photographs of the body, if possible. Record the information specified on the Protected Species Incidental Take Form and send form via email to nmfs.ser.ea_loa.takereport@noaa.gov within 24 hrs.

    f. Researchers that have been trained by an ESA Section 10(a)(1)(A) permit holder for smalltooth sawfish should collect biological samples and tag captured animals. Tissue samples in the form of fin clips (approximately 1 gram of tissue) should be collected in from the trailing edge of the second dorsal fin. Samples should be preserved in ethanol if available, otherwise the samples should be frozen.

    g. Use extreme caution when handling and releasing sawfish as the rostrum can thrash violently from side to side.

2. **Live Entanglements/Hookings/Trawl Captures - Sturgeon:**

    a. Ensure animals are handled rapidly, but with care and kept underwater to the maximum extent possible during handling.

    b. If can be done without further harming the animal, photograph the hooking/entanglement location prior to release. Take multiple photographs of the body, if possible. Record the information specified on the Protected Species Incidental Take Form send form via email to nmfs.ser.ea_loa.takereport@noaa.gov within 24 hrs.

    c. Researchers should also collect a tissue sample from any sturgeon handled onboard if the animal appears healthy. Requirements for the handling and collection of biological and tissue/genetic data on incidentally taken sturgeon are described in A Protocol for Use of Shortnose, Atlantic, Gulf, and Green Sturgeons (NOAA Technical Memorandum NMFS-OPR-45, pages 12-19, attached). PIT tags should be applied (as described in NOAA TM NMFS-OPR-45) to previously untagged fish, if tags are available.

    d. Release the animal as soon as possible, near the capture area, but in a manner that minimizes the likelihood of recapture if sampling continues.

e. If the fish has air in its bladder, efforts must be made to return the fish to neutral buoyancy prior to release. Release air by gently applying pressure to the animal's stomach, moving from the tail toward the head.

f. Before releasing the animal hold it underwater while gently moving the tail fin back and forth to aid water passage over the gills.

g. The fish should be released when it shows signs of increased activity and is able to swim away under its own power.

h. The fish should be watched to make sure it stays underwater and does not float to the surface. If it does resurface, make one additional attempt to recapture the animal and repeat steps 4-7 above.

i. For help with any questions relating to sturgeon, researchers should contact Stephania Bolden, Protected Resources, Southeast Regional Office, NMFS, at (727) 824-5312 (Fax: 727-824-5309).

3. In Case of ESA-listed Fish Mortality:

a. Smalltooth sawfish and Gulf sturgeon – Dead smalltooth sawfish or Gulf sturgeon should be retained. First remove a tissue sample (fin clip), scan the carcass for PIT tags, and photograph the animal. The remaining specimen(s) or body parts should be preserved (iced/refrigerated or frozen if ice/refrigeration not possible) until additional sampling and disposal procedures are discussed with the designated NMFS contact (see Table 1). If it is not possible to retain the carcass, spray paint the carcass, if possible, and discard carcass near original site of capture. Report the encounter to HMS within 24 hrs.

b. Atlantic or Shortnose sturgeon – In the event of a mortality, scan the entire carcass for PIT tags and obtain a tissue sample (fin clip). Spray paint the carcass, if possible, and discard at or near the capture location. Please report the incident via the sturgeon reporting hotline at 1-844-STURG-911 (1-844-788-7491) or via email at nmfs.ser.sturgeonnetwork@noaa.gov. Samples should be sent to contact identified in Table 1.

4. Reporting:

a. For entanglements/captures/hookings, please fill out the NOAA Fisheries Southeast Region Protected Species Reporting Form within 24 hours of the incidental take and submit to nmfs.ser.ea_loa.takereport@noaa.gov. Please enter Fisheries Independent Monitoring Protected Species Take (BiOp SER-2009-7541) in the subject line and include the project name and species in the text of the email.

Sawfish Handling and Release Guidelines

Keep as much of the sawfish in the water as possible.

Use extreme caution when handling and releasing sawfish as the saw can thrash violently from side to side

For sawfish caught on longline gear:

- **Use line cutting poles, boltcutters, long-handled de-hookers and boat hooks to aid in removing gear, including hooks, from the sawfish**
- **If the sawfish is hooked and not entangled, cut the line as close to the hook as possible. Remove the hook with a dehooker, if possible**
- **If the sawfish is hooked and line is tangled around the saw (rostrum), remove all line with a boat hook or line cutting pole, then cut the line as close to the hook as possible. Remove the hook with a de-hooker, if possible**
- **If hooked internally, do NOT attempt to remove the hook, use line cutting pole or boat hook to remove as much line as possible**

For sawfish caught in trawl or gill net gear:

- **DO NOT REMOVE THE FISH'S SAW (ROSTRUM)**
- **Leave the sawfish, especially the gills, in the water as much as possible**
- **Use line cutting pole or knife to cut any net tangled around the saw by cutting the mesh along the length of the saw**
- **Once mesh is cut, work it free with a boat hook or line cutting pole**

In your logbook, document as much information as possible including:

- Date and time of encounter
- Location (GPS coordinates)
- Habitat (water depth, bottom type)
- Estimated total length of sawfish including saw
- Description of gear that could not safely be removed from the animal
- Markings, scars, wounds
- If present, record tag number and type (shape and color) (tags are found on or below the dorsal fins), but do not remove the tag
- Details of capture (bait, hook size/type, mesh size, length of gear)
- Sex of sawfish, if known (male sawfish, like sharks, have two claspers at the base of the pelvic fins)

Do not remove the saw or injure the sawfish in any way.

With a little extra effort, and the proper use of required tools, endangered smalltooth sawfish can be returned to the water with little or no damage.

Smalltooth sawfish are listed as endangered under the Endangered Species Act and "take" of listed species is prohibited under section 9 of the Endangered Species Act. Any sawfish caught while fishing must be released as quickly as possible. More information can be found at https://www.fisheries.noaa.gov/species/smalltooth-sawfish

Sawfish Handling and Release Guidelines

Smalltooth sawfish are listed as endangered under the Endangered Species Act and "take" of listed species is prohibited under section 9 of the Endangered Species Act. "Take", as defined by the Endangered Species Act means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. If a sawfish is hooked or netted it should be released immediately. Remove as much fishing gear as safely possible without harming the animal. Sawfish are large, powerful animals that can cause serious injury. For your safety, and the safety of the sawfish, use extreme caution if you hook or net one.

General guidelines:

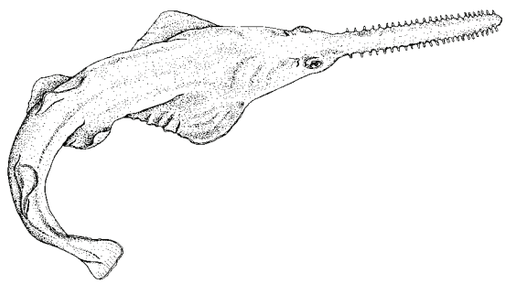
- **Keep the sawfish in the water as much as possible**
- **Do not remove the saw (rostrum) or injure the animal in any way.**
- **Use extreme caution when handling and releasing sawfish as the saw can thrash violently from side to side**

For sawfish caught in trawl or gill net gear:

- **Do not remove the fish's saw**
- **Leave the sawfish, especially the gills, in the water as much as possible**
- **Use line cutting pole or knife to cut any net tangled around the saw by cutting the mesh along the length of the saw**
- **Once mesh is cut, work it free with a boat hook or line cutting pole**

For sawfish caught on longline gear:

- **Keep the sawfish in the water at all times**
- **Use line cutting poles, boltcutters, long-handled dehookers and boat hooks to aid in removing gear, including hooks, from the sawfish**
- **If the sawfish is hooked and not entangled, cut the line as close to the hook as possible. Remove the hook with a dehooker, if possible**
- **If the sawfish is hooked and line is tangled around the saw (rostrum), remove all line with a boat hook or line cutting pole, then cut the line as close to the hook as possible. Remove the hook with a dehooker, if possible**
- **If hooked internally, do NOT attempt to remove the hook, use line cutting pole or boat hook to remove as much line as possible**



Sawfish sketch courtesy of Mote Marine Laboratory

This pamphlet was produced by Mote Marine Laboratory's Sawfish Research Project for National Marine Fisheries Service Office of Protected Resources, under Solicitation # WC133F-06-RQ-0656, in compliance with Section 212 of the Small Business Regulatory Enforcement Fairness Act.

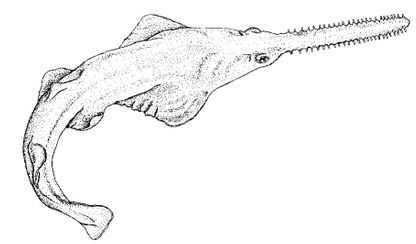
National Marine Fisheries Service
Protected Resources Division
263 13th Avenue, South
Saint Petersburg, Florida 33701
http://sero.nmfs.noaa.gov/

Smalltooth Sawfish Management Information

National Marine Fisheries Service

Protected Resources Division

This pamphlet provides information on the biology, population history, safe handling and release guidelines, and encounter reporting details for the endangered smalltooth sawfish.



Background

In November 1999, National Marine Fisheries Service (NMFS) received a petition from The Ocean Conservancy (formerly the Center for Marine Conservation) requesting that this species be listed as endangered under the Endangered Species Act (ESA). NMFS completed a status review in December 2000 and on April 1, 2003 announced its final determination to list smalltooth sawfish as an endangered species under the ESA. Under the ESA, it is illegal to catch, possess, harass or harm an endangered sawfish. However, some fishermen catch sawfish incidentally while fishing for other species. NMFS has developed these guidelines for fishermen on how to safely handle and release any sawfish they catch.

Conservation Efforts

After listing under the ESA, NMFS convened the Smalltooth Sawfish Recovery Team comprised of scientists, fisheries managers, and environmental managers, to develop a plan to recover the U.S. population of smalltooth sawfish. The plan recommends specific steps to recover the population, focusing on reducing fishing impacts, protecting important habitats, and educating the public.

Species Description

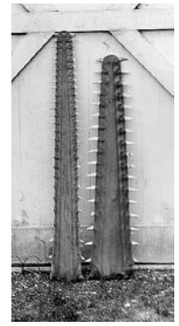
Sawfish, like sharks, skates and rays, belong to a class of fish called elasmobranchs, whose skeletons are made of cartilage. Sawfish are modified rays with a shark-like body, and gill slits on their ventral, or under, side. Sawfish get their name from their "saws"- long, flat snouts edged with teeth which are used to locate, stun, and kill prey. Their diet includes mostly fish and some crustaceans. Smalltooth sawfish commonly reach 18 ft in length and may grow to 20 ft. Little is known about the life history of these animals but they may live up to 50 years, maturing after about 10 to 20 years. Like many elasmobranchs, smalltooth sawfish are ovoviviparous, meaning the mother holds the developing young inside of her until they are ready to be born live, in litters of up to 20 pups.

Smalltooth vs. Largetooth Sawfish

The smalltooth sawfish is one of two species of sawfish that inhabit U.S. waters. However, the largetooth sawfish has not been definitively recorded in US waters for several decades. Several characteristics make the two species easy to distinguish.

Smalltooth sawfish (left)
Largetooth sawfish (right)

Photo courtesy of Florida Museum of Natural History



Smalltooth Sawfish *Pristis pectinata* (left)	Largetooth Sawfish *Pristis perotteti* (right)
Saw slightly tapers to tip	Saw much wider at base than tip
22-34 teeth per side of saw	14-21 teeth per side of saw
First dorsal fin over origin of pelvic fins	First dorsal fin well in front of origin of pelvic fins
Caudal fin lacks a lower lobe	Caudal fin contains distinct lower lobe

Habitat

Sawfish species inhabit shallow coastal waters of tropical seas and estuaries throughout the world. They are usually found in shallow waters very close to shore over muddy and sandy bottoms. They are often found in sheltered bays, on shallow banks, and in estuaries or river mouths. Certain species of sawfish are known to ascend inland in large river systems, and they are among the few elasmobranchs that are known from freshwater systems in many parts of the world.

Distribution

Historically, the U.S. population of smalltooth sawfish was common throughout the Gulf of Mexico from Texas to Florida, and along the east coast from Florida to New York. The current range of this species has contracted to peninsular Florida, and smalltooth sawfish are relatively common only in the Everglades region at the southern tip of the state. No accurate estimates of abundance trends over time are available for this species. However, available records, including museum records and anecdotal fisher observations, indicate that this species was once common throughout its historic range and that smalltooth sawfish have declined dramatically in U.S. waters over the last century.

Population Trends

There are few reliable data available for this species, and no robust estimates of historic or current population size exist. However, available data indicate that the species' geographic range has been reduced by about 90%, and that the population numbers have declined dramatically, perhaps by 95% or more.

Threats

Sawfish are extremely vulnerable to overexploitation because of their propensity for entanglement in fishing gear, their restricted habitat, and low rate of population growth. The decline in smalltooth sawfish abundance has been caused primarily by bycatch in various fisheries, especially in nets. Because adults can grow very large, and potentially damage fishing gear or even pose a threat to fishermen, many incidentally captured sawfish were killed before they were removed from fishing gear. The loss of habitat also likely contributed to the decline of this species. Important habitats, such as mangrove forests, have been modified or lost due to development of the waterfront throughout their range.

Encounter Reporting Requirements

In your logbook, document as much information as possible including:

- Date and time of encounter
- Location (GPS coordinates)
- Habitat (water depth, bottom type)
- Estimated total length of sawfish including saw
- Tooth counts on left and right side of saw (rostrum) if possible to obtain safely
- Description of gear that could not safely be removed from the animal
- Markings, scars, wounds
- If present, record tag number and type (shape and color) (tags are on or below the dorsal fins), but do not remove the tag
- Details of capture (bait, hook size/type, mesh size, length of gear)
- Sex of sawfish, if known (male sawfish, like sharks, have two claspers at the base of the pelvic fins)

More information and recovery documents can be found at
http://www.nmfs.noaa.gov/pr/species/fish/smalltoothsawfish.htm

Protected Sturgeon of the Eastern United States

Atlantic Sturgeon
(*Acipenser oxyrinchus oxyrinchus*)

NMFS

Species Description

Weight: up to 800 pounds (370 kg)
Length: 14 feet (4.3 m)
Appearance: bluish-black or olive brown with paler sides and a white belly; they have 5 major rows of bony plates (scutes): one along the back, one on either side, and two along the belly. No scales, long, hard snout with an upturned tip, mouth relatively narrow, 4 sensory barbels on the underside of the snout.

Sturgeon are generally found in rivers from March - November and in bays, estuaries, and the marine environment during the winter (November to late February) months.

Shortnose Sturgeon
(*Acipenser brevirostrum*)

NMFS

Species Description

Weight: up to 50 pounds (23 kg)
Length: up to 4.5 feet (1.4 m)
Appearance: Brown, tan or bluish-black body, whitish belly, 5 rows of scutes covering the head and body: one along the back, one on either side, and two along the belly, no scales, snout is short, broad and blunt, wide mouth, 4 sensory barbels on the underside of the snout.

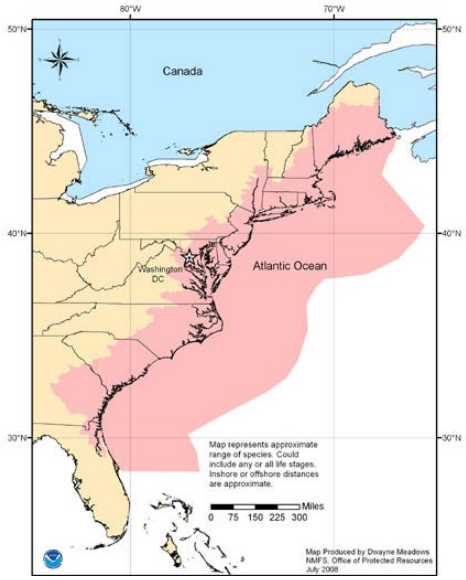
All sturgeon are either endangered or threatened.

It is illegal to fish for, catch or keep them or their parts commercially or recreationally. A permit is required for scientific research, handling and possession.

Atlantic sturgeon (left) are similar in appearance to shortnose sturgeon (right) but can be distinguished by their larger size, smaller mouth, different snout shape, and scutes.

B. Post/SCDNR

Atlantic and Shortnose Sturgeon Range



Additional sturgeon information:
http://sero.nmfs.noaa.gov/protected_resources/

All activities pictured were conducted pursuant to a NMFS Permit.

Layout: M. Cook, NOAA Fisheries Service

Protected Sturgeon of the Gulf of Mexico

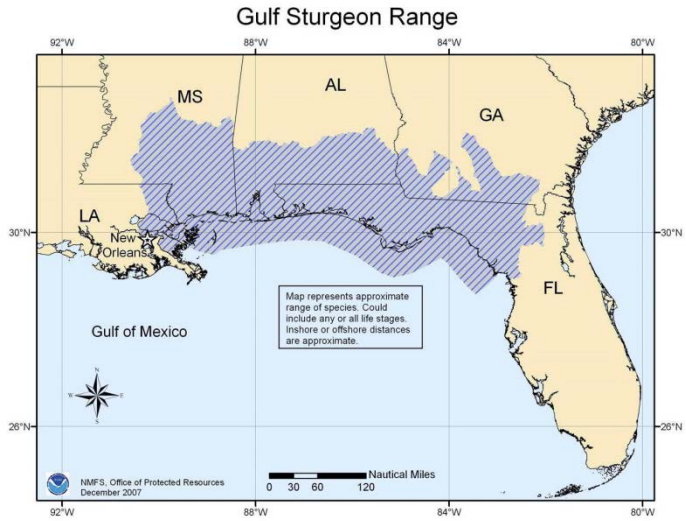
Gulf Sturgeon
(*Acipenser oxyrinchus desotoi*)

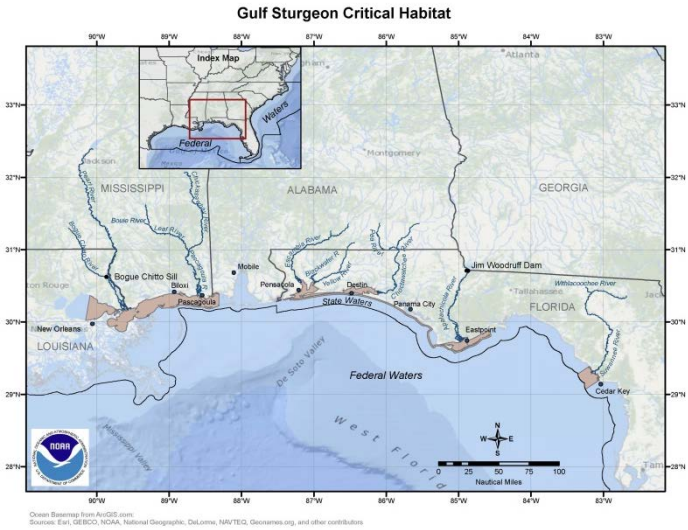
Species Description

Weight: up to 200 lbs. (90 kg)
Length: 4-8 feet (1-2.5 m)
Appearance: Light neutral color to dark brown, white under belly, they have 5 major rows of bony plates (scutes): one along the back, one on either side, and two along the belly. No scales, long, hard snout with an upturned tip, mouth relatively narrow, 4 sensory barbels on the underside of the snout.

Gulf sturgeon are almost impossible to visually differentiate from Atlantic sturgeon, however, their ranges do not overlap.

Gulf sturgeon are endangered throughout their range. Designated critical habitat includes 14 geographic areas from FL to LA, encompassing spawning rivers and adjacent estuarine areas.





Additional sturgeon information:
http://sero.nmfs.noaa.gov/protected_resources/

All activities pictured were conducted pursuant to a NMFS Permit.

Layout: M. Cook, NOAA Fisheries Service

Atlantic Sturgeon are Protected By Federal Law Due to their Endangered Status

Atlantic Sturgeon Safe Handling and Release Guidelines

If you accidentally hook an Atlantic Sturgeon, take the following actions to release it with care

1. Rapidly handle the fish with care, and keep it underwater to the maximum extent possible during handling.

2. If the fish has air in its bladder, return the fish to neutral buoyancy prior to, and during, release. Gently apply pressure to the stomach of the animal by moving from the tail toward the head to release the air from the bladder.

3. Before releasing the fish, hold it underwater, and gently move the tail fin back and forth to aid water passage over the gills.

4. Release the fish when it shows signs of increased activity and is able to swim away under its own power.

5. Watch the fish to ensure it stays underwater and does not float to the surface. If it does resurface, make one additional attempt to recapture the animal and repeat steps 1-4 above.

A Protocol for Use of Shortnose, Atlantic, Gulf, and Green Sturgeons

Jason Kahn and Malcolm Mohead

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

NOAA Technical Memorandum NMFS-OPR-45
March 2010

Atlantic sturgeon (Robert Michelson, Photography by Michelson, Inc.)

Gulf sturgeon (Oscar Sosa, *New York Times*)

Green sturgeon (Thomas Dunklin)

Cover: shortnose sturgeon (credit: Robert Michelson)

Suggested citation:

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A copy of this report may be obtained from:

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Handling and Holding

Handling of sturgeon refers to the time period actual research activities are conducted on live fish and does not refer to the time a fish is held in live cars before and after research activities. Holding is the period of time a sturgeon is in possession but kept in live cars either waiting to be handled or recovered from handling prior to being released.

Proper Handling of Sturgeon

Improper handling can result in lethal or sub-lethal impacts to sturgeon. In some cases, sturgeon may display altered behavior after being released, for example, swimming towards the ocean rather than remaining in the river, or, in some instances, aborting spawning runs completely (Moser and Ross 1995, Schaffter 1997, Kelly *et al.* 2007, Benson *et al.* 2007, Moser and Lindley 2007). There are no other alternatives to handling sturgeon during research; however, the researcher's primary focus should be the well-being of the sturgeon.

NMFS strongly recommends standard handling procedures performed on all sturgeon captured including measuring, weighing, PIT tagging, and tissue sampling. The total time required to complete routine research procedures should not exceed 15 minutes. Additional procedures such as internal tagging, lavage, boroscoping, etc. will take more time for handling and recovery. However, only one additional discretionary procedure to the standard handling procedures should be performed on each sturgeon, thus minimizing handling time prior to release. For example, if a sturgeon is fitted with a telemetry tag, it should not also undergo gastric lavage. And when water temperatures are above 23°C for green sturgeon or 25°C for Gulf, shortnose, or Atlantic sturgeon, the extent of research should be limited to the standard handling procedures of measuring, weighing, PIT tagging, and tissue sampling.

Fish should be handled rapidly, but with care and kept in water to the maximum extent possible during handling. During handling procedures, each fish should be immersed in a continuous stream of ambient water passing over the sturgeon's gills. Many sturgeon researchers provide sturgeon with supplemental compressed oxygen, thereby reducing stress and ensuring DO does not fall below acceptable saturation levels.

Researchers should also attempt to support larger sturgeon in slings preventing struggle during transfer. Sturgeon should be weighed using hand held sling scales or a platform scale for larger sturgeon. Also, because sturgeon are sensitive to direct sunlight, they should be covered and kept moist.

Short-Term Holding

All captured sturgeon should be removed from the capture gear and immediately transferred to short-term holding. When multiple fish are captured, those not processed immediately should be held in a net pen or live car while waiting to be transferred by hand or sling to a processing station on board. Net pens measuring three feet wide, six feet long, and three feet deep can safely hold about 20 adult shortnose sturgeon or comparably sized juvenile Atlantic, Gulf or green sturgeon when temperatures are below

15°C (Doug Peterson, University of Georgia, pers. comm.). Larger net pens (8 feet long) are required for holding adult Atlantic, green, and Gulf sturgeon or they should be processed as quickly as possible (or scheduled first) instead of subjected to confined holding conditions. When water temperature is between 15° and 25°C, fewer fish should be held in the same enclosure because overcrowding animals amplifies short term stress, particularly at higher temperatures (Safi *et al.* 2006). If the fish are being held on-board a vessel in a holding tank, compressed oxygen should be added to increase DO in the water. If the researcher observes a visually stressed sturgeon, efforts should be made to revive the fish and release it in a healthy condition. In some cases, recovery can be achieved by allowing a sturgeon to rest in an appropriately sized net pen for several hours prior to release.

Sturgeon should never be held in gillnets if there isn't enough room to safely hold them in net pens. In some rivers with large populations of sturgeon, catches can exceed the number of fish that can possibly be held safely in live cars or net pens. In such cases, researchers should have multiple holding bins at their disposal. If more fish are captured than can be processed and released within two hours, those excess fish may need to be released to minimize stress or lethal injury.

When sturgeon are held on-board research vessels, they should be placed in flow through tanks where the total volume of water is replaced every 15 to 20 minutes. Traditionally, some species of sturgeon have been held for research purposes by tethering with ropes looped around tails to the sides of research vessels until they can be handled. In a study of lake sturgeon (Axelsen and Mauger 1993 cited in Dick *et al.* 2006), tethered fish experienced greater stress and higher mortality than sturgeon kept in uncrowded cages. Therefore, NMFS recommends only using on-board holding tanks or net pens large enough to hold a large sturgeon. NMFS does not recommend holding any sturgeon by tethering its caudal peduncle to the research vessel. However, while a rope should never be tied around the caudal peduncle, it may be necessary to use a rope placed under the sturgeon immediately posterior to the pectoral fins when moving large sturgeon from net pens onto the boat.

Following handling procedures, fish should be returned to the net pen for observation and to ensure full recovery prior to release. Total holding time in the net pens would be variable depending on water temperature and the condition of each fish, however, the maximum amount of time a fish should be held after removal from capture gear is approximately two hours, unless more time is needed to recover from the effects of an anesthetic or because prolonged holding would benefit a sturgeon. When water temperature is above 25°C for Gulf, shortnose, and Atlantic sturgeon, or 23°C for green sturgeon, they should be held for as little time as possible. Holding time includes the time to remove any other captured sturgeon, time to process other fish, and time necessary for recovery ensuring the safety of the fish.

Prior to release, sturgeon should be examined and, if necessary, recovered by holding fish upright and immersed in river water, gently moving the fish front to back, aiding freshwater passage over the gills to stimulate it. The fish should be released when

showing signs of vigor and able to swim away under its own power. A spotter should watch the fish, making sure it stays submerged and does not need additional recovery.

Recommendations

Proper Handling of Sturgeon

- NMFS strongly recommends standard handling procedures performed on all sturgeon captured including measuring, weighing, PIT tagging, and tissue sampling.
- Only one additional discretionary procedure to the standard handling procedures should be performed on each sturgeon, thus minimizing handling time prior to release.
- When water temperatures are above 23°C for green sturgeon or 25°C for Gulf, shortnose, or Atlantic sturgeon, the extent of research should be limited to the standard handling procedures of measuring, weighing, PIT tagging, and tissue sampling.
- During handling procedures, each fish should be immersed in a continuous stream of ambient water passing over the sturgeon's gills.
- Researchers should attempt to support larger sturgeon in slings preventing struggle during transfer.
- If the researcher observes a severely stressed sturgeon, efforts should be made to revive the fish and release it in a healthy condition.

Short-Term Holding

- Sturgeon should never be held in gillnets while waiting to be handled, but should instead be transferred to a net pen for holding.
- NMFS recommends only using on-board holding tanks or net pens large enough to hold a large sturgeon. NMFS does not recommend tethering sturgeon to the boat by its caudal peduncle.
- The maximum amount of time a fish should be held after removal from capture gear is approximately two hours, unless more time is needed to recover from the effects of an anesthetic or because prolonged holding would benefit a sturgeon.
- Adult Atlantic, green, and Gulf sturgeon over six feet in length should be processed as quickly as possible (or scheduled first) instead of subjected to confined holding conditions.

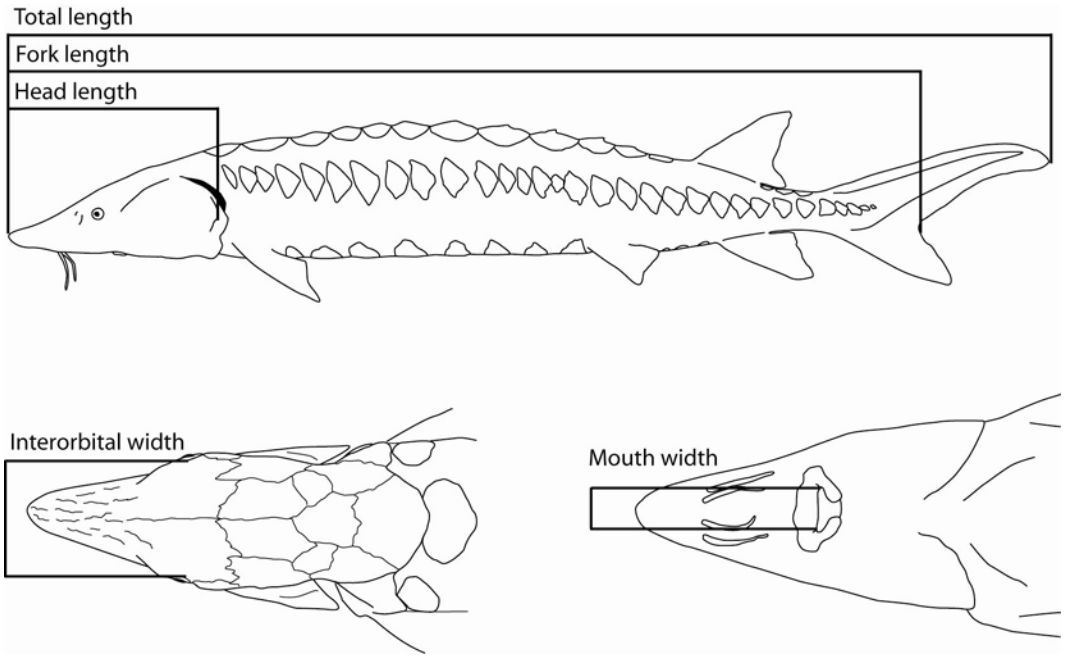
Standard Research Methods

Upon capturing a green, Gulf, shortnose, or Atlantic sturgeon, there are several research procedures strongly recommended on all sturgeon. First, the captured fish is to be measured. The sturgeon should also be weighed if possible. It can also be photographed, if possible. Then, their entire bodies should be scanned for previously inserted PIT tags; and, if none are found, one should be properly inserted. Finally, a small sample of the soft tissue of the pelvic fin should be removed for genetic identification.

Measuring

Standardized length measurements for all sturgeon should be taken from the snout to the fork in the tail (i.e., fork length – FL). The measuring device should be a solid ruler or board, so the measurement does not measure the curvature of the body. Additional length measurements should be taken at the researcher's discretion for total length (TL) or head length (Figure 1). While the heterocercal tail of larger fish may be damaged or shortened, the total length can still be obtained by pressing down the tail at the caudal peduncle and measuring to the tip of the tail. Girth measurements should also be taken at the widest part of the body. While not mandatory, measurements of the ratio of mouth width to interorbital width can also be obtained to differentiate between shortnose and Atlantic sturgeon (Dadswell *et al.* 1984). Interorbital width is measured as the distance between the lateral margins of the bony skull at the midpoint of the orbit and mouth width is measured as the distance between the left and right inside corners of the closed mouth (i.e., excluding the lips) (Figure 1).

Figure 1. Diagram of different types of measurements for sturgeons. Drawings by Eric Hilton, Virginia Institute of Marine Science.



Weighing
All captured sturgeon should be weighed if possible. Weights allow a better understanding of the conditioning of captured sturgeon during various seasons of the year or life span of the fish. For weighing sturgeon, animals should be supported with a sling or net and handling should be minimized throughout the procedure.

Boats used for researching green, Gulf, and Atlantic sturgeon should accommodate larger fish with scales available to safely weigh a 200 pound fish. When targeting shortnose sturgeon (or juvenile green, Gulf, or Atlantic sturgeon), hand-held sling scales are acceptable. When using a bench scale or platform scale to weigh large sturgeon, a five to six foot flat platform will be necessary to support the fish.

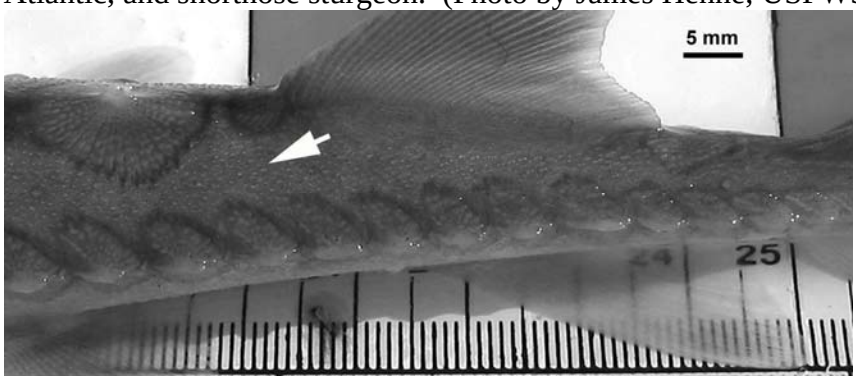
Photographing
When handling sturgeon, optional photography is often used to document the health of fish, research methods, and any identifying marks on the sturgeon potentially useful in the future. Although it is recommended to take as many pictures as needed, researchers should do so without interfering with other research activities.

PIT Tags
Every sturgeon should be scanned for PIT tags along its entire body surface ensuring it has not been previously tagged. Untagged sturgeon should then be appropriately PIT tagged (Figure 2) and the identifying number recorded. Each PIT tag consists of integrated circuitry and an antenna encapsulated in glass. PIT tags are "passive" because they contain no batteries; their internal code is activated and transmitted to the receiver when exposed to the transceiver's electromagnetic signal. The newest PIT tags, and those recommended by NMFS, use a frequency of 134.2 kHz.

Standardized PIT tag placement for Gulf, green, Atlantic, and shortnose sturgeon would enable subsequent researchers to locate prior PIT tags quickly and consistently. Sturgeon, are large fish growing a considerable amount from the time they're first PIT-tagged until they reach their adult size. If muscles grow over the PIT tag as they mature, the tag can become increasingly more difficult to read.

For this reason, NMFS strongly recommends PIT tag placement in all four sturgeon species to be located to the left of the spine, immediately anterior to the dorsal fin, and posterior to the dorsal scutes (Figure 2). This positioning would optimize PIT tag readability over the animal's lifetime as sturgeon experience the least new muscle growth in this location during their lifetimes (Berg 2004, Simpson and Fox 2006). After the tag is inserted, it should be scanned to ensure it is readable before the fish is released. If necessary, to ensure tag retention and prevent harm or mortality to small juvenile sturgeon of all species, the PIT tag can also be inserted at the widest dorsal position just to the left of the 4th dorsal scute.

Figure 2. Standardized location for PIT tagging all green, Gulf, Atlantic, and shortnose sturgeon. (Photo by James Henne, USFWS)



PIT tags have the highest reported retention rate of all identification tags, though they are not visible to the researcher or fisherman upon capture. Clugston (1996) found PIT tags implanted in gulf sturgeon have approximately a 90% retention rate. Musick and Hager (2007) tagging 445 Atlantic sturgeon reported a 99% retention rate of PIT tags after 96 hours. Smith *et al.* (1990) noted 100% retention after 60 days in wild shortnose sturgeon. In the Penobscot River, retention rates for PIT tags in Atlantic sturgeon were 93% after as much as 8.8 years (Gayle Zydlewski, University of Maine, pers. comm.). Nelson *et al.* (2007) report approximately 100% retention of PIT tags in recaptured white sturgeon.

Other researchers have had different results. Researchers with EDI Environmental Dynamics (2006) reported recapturing three white sturgeon, with 66% retention of PIT tags. DeHaan *et al.* (2008) recorded 51 to 95% retention when PIT-tagging juvenile pallid sturgeon, which is similar to rates observed by Henne *et al.* (unpublished).

As with all research procedures, there is a risk of injury or mortality either directly or indirectly related to PIT tagging. When PIT tags are inserted into animals having large body sizes relative to tag size, empirical studies generally conclude they have no adverse effect on the growth, survival, reproductive success, or behavior of individual animals (Brännäs *et al.* 1994, Elbin and Burger 1994, Keck 1994, Jemison *et al.* 1995, Clugston 1996, Skalski *et al.* 1998, Hockersmith *et al.* 2003). However, smaller sturgeon may experience mortality within the first 24 hours, usually as a result of inserting the tags too deeply or from pathogenic infection. When analyzing mortality of small sturgeon caused by PIT tags, Henne *et al.* (2008) found 11 and 14 mm tags inserted into shortnose sturgeon longer than 300 mm was safe. In this study, they found that when fish are under 300 mm, factors other than length, such as weight or condition, most influence the likelihood of mortality. Therefore, NMFS recommends only sturgeon over 300 mm should receive PIT tags.

A negative aspect of using PIT tags in sturgeon research is the difficulty for NOAA observers or non-researchers to detect tags in recaptured sturgeon without the benefit of a PIT tag reader. Rien *et al.* (1994) and Nelson *et al.* (2004) recommend removal of the second left lateral scute indicating the presence of a PIT tag in white sturgeon. This methodology has been subsequently used for green sturgeon as well. While removal of

scutes rarely results in bleeding, and is not considered deleterious, there are other, safer means for externally marking sturgeon. NMFS believes a standardized PIT tag location is less stressful to animals and is easily located. If an external mark is necessary, NMFS recommends using other external tags identified in this document. Those external tags are not only obvious to other researchers, but also to the general public for identifying recaptured animals to alert researchers of their recapture. NMFS therefore recommends using external tags to identify the presence of a PIT tag, if necessary, but researchers should not remove scutes from sturgeon for any reason.

Genetic Tissue Sampling

Tissue sampling is a common practice in fisheries science characterizing the genetic "uniqueness" and quantifying the level of genetic diversity within a population. NMFS strongly recommends genetic tissue samples be taken from every sturgeon captured unless, due to marks or tags, the researcher knows a genetic sample has already been obtained. Tissue samples should be a small (1.0 cm^2) fin-clip collected from soft pelvic fin tissues using a pair of sharp scissors. Tissue samples should be preserved in individually labeled vials containing 95% ethanol. There is no evidence that this procedure harms any species of sturgeon.

Recommendations

Strongly Recommended

- Researchers should measure all captured green, Gulf, Atlantic, and shortnose sturgeon. The sturgeon should also be weighed, if possible.
- Researchers should scan captured sturgeon for previously inserted PIT tags; and, if none are found, one should be properly inserted.
- Researchers should remove a small tissue sample by clipping the soft tissue of the pelvic fin.

Measuring

- Standardized length measurements for all sturgeon should be taken from the snout to the fork in the tail.
- NMFS recommends measuring the ratio of mouth width to interorbital width to differentiate shortnose and Atlantic sturgeon.

PIT Tags

- NMFS recommends PIT tag placement in all four sturgeon species to be located to the left of the spine, immediately anterior to the dorsal fin, and posterior to the dorsal scutes.
- NMFS recommends using 134.2 kHz PIT tags.
- If necessary, to ensure tag retention and prevent harm or mortality to small juvenile sturgeon of all species, the PIT tag can also be inserted at the widest dorsal position just to the left of the 4th dorsal scute.
- NMFS recommends only sturgeon over 300 mm should receive PIT tags.
- NMFS recommends using external tags to identify the presence of a PIT tag, if necessary, but researchers should not remove scutes from sturgeon for any reason.

Genetic Tissue Sampling

- NMFS strongly recommends genetic tissue samples be taken from every sturgeon captured unless, due to marks or tags, the researcher knows a genetic sample has already been obtained.
- Tissue samples from Gulf, green, Atlantic, and shortnose sturgeon should be archived at the NOAA/NOS Tissue Archive in Charleston, South Carolina. Proper certification, identity, and chain of custody of samples should be maintained during transfer of tissue samples.

Incidental Take Response, Handling and Reporting Procedures for Marine Mammals

1. **Live Entanglements/Hookings/Trawl Captures:**

    a. **Incidental captures and vessel strikes must be reported immediately to the NOAA Fisheries Marine Mammal Stranding Hotline (877-433-8299).**

    b. While considering human safety, work from the vessel as quickly and carefully as possible to free the animal from the gear. Never enter the water to attempt disentanglement. Ensure the animal's blowhole is kept at the surface as much as possible to allow it to continue to breathe while disentangling.

    c. Before releasing the animal, ensure all net or line (or as much as possible) is cut away from the animal.

    d. If possible, photograph the animal once it is free from gear, prior to its release. Record the information specified on the Protected Species Incidental Take Form and send form via email to nmfs.ser.ea_loa.takereport@noaa.gov within 24 hrs.

    e. Provide a detailed narrative to accompany the NOAA Fisheries Southeast Region Protected Species Reporting Form that includes a complete description of the incident including:

    f. Whether the animal was seen prior to entanglement and a description of its behavior and direction of travel relative to the vessel

    g. Discretionary decisions made by the Chief Scientist or Captain, including rationale for those decisions

    h. Description of how the animal was entangled in the gear, if gear is left on the animal, a description of how the gear was cut and where, approximately how much gear is left on the animal and where it is still entangled

2. **In Case of Marine Mammal Mortality:**

    a. **All mortalities due to incidental captures or vessel strikes must be reported immediately to the NOAA Fisheries Marine Mammal Stranding Hotline (877-433-8299).** In the event of marine mammal mortality, haul the animal aboard the vessel, place in a shaded area, cover and ice carcass, if possible, and retain for pickup by a Stranding Network member. If the animal is unable to be hauled aboard due to human safety and other unforeseen logistics, call the NOAA Fisheries Marine Mammal Stranding Hotline at 1-877-433-8299 for guidance. Photos and measurements (from the tip of upper jaw to the notch in the tail) should also be taken before the carcass is discarded.

    b. Provide a detailed narrative to accompany the NOAA Fisheries Southeast Region Protected Species Reporting Form that includes a complete description of the incident including whether the animal(s) was seen prior to entanglement and a description of its behavior and direction of travel relative to the vessel. Please include any photos taken of the animal during and/or after the entanglement.

3. Reporting:

a. For entanglements/captures/hookings, please fill out the NOAA Fisheries Southeast Region Protected Species Reporting Form within 24 hours of the incidental take and submit to nmfs.ser.ea_loa.takereport@noaa.gov. Please enter Fisheries Independent Monitoring Protected Species Take (BiOp SER-2009-7541) in the subject line and include the project name and species in the text of the email.

b. For marine mammal vessel strikes, please complete both the SER Vessel Strike form and NOAA Fisheries Southeast Region Protected Species Reporting Form.

Incidental Take Response, Handling and Reporting Procedures for Marine Mammals

1. **Live Entanglements/Hookings/Trawl Captures:**

    a. **Incidental captures and vessel strikes must be reported immediately to the NOAA Fisheries Marine Mammal Stranding Hotline (877-433-8299).**

    b. While considering human safety, work from the vessel as quickly and carefully as possible to free the animal from the gear. Never enter the water to attempt disentanglement. Ensure the animal's blowhole is kept at the surface as much as possible to allow it to continue to breathe while disentangling.

    c. Before releasing the animal, ensure all net or line (or as much as possible) is cut away from the animal.

    d. If possible, photograph the animal once it is free from gear, prior to its release. Record the information specified on the Protected Species Incidental Take Form and send form via email to nmfs.ser.ea_loa.takereport@noaa.gov within 24 hrs.

    e. Provide a detailed narrative to accompany the NOAA Fisheries Southeast Region Protected Species Reporting Form that includes a complete description of the incident including:

    f. Whether the animal was seen prior to entanglement and a description of its behavior and direction of travel relative to the vessel

    g. Discretionary decisions made by the Chief Scientist or Captain, including rationale for those decisions

    h. Description of how the animal was entangled in the gear, if gear is left on the animal, a description of how the gear was cut and where, approximately how much gear is left on the animal and where it is still entangled

2. **In Case of Marine Mammal Mortality:**

    a. **All mortalities due to incidental captures or vessel strikes must be reported immediately to the NOAA Fisheries Marine Mammal Stranding Hotline (877-433-8299).** In the event of marine mammal mortality, haul the animal aboard the vessel, place in a shaded area, cover and ice carcass, if possible, and retain for pickup by a Stranding Network member. If the animal is unable to be hauled aboard due to human safety and other unforeseen logistics, call the NOAA Fisheries Marine Mammal Stranding Hotline at 1-877-433-8299 for guidance. Photos and measurements (from the tip of upper jaw to the notch in the tail) should also be taken before the carcass is discarded.

    b. Provide a detailed narrative to accompany the NOAA Fisheries Southeast Region Protected Species Reporting Form that includes a complete description of the incident including whether the animal(s) was seen prior to entanglement and a description of its behavior and direction of travel relative to the vessel. Please include any photos taken of the animal during and/or after the entanglement.

3. Reporting:

a. For entanglements/captures/hookings, please fill out the NOAA Fisheries Southeast Region Protected Species Reporting Form within 24 hours of the incidental take and submit to nmfs.ser.ea_loa.takereport@noaa.gov. Please enter Fisheries Independent Monitoring Protected Species Take (BiOp SER-2009-7541) in the subject line and include the project name and species in the text of the email.

b. For marine mammal vessel strikes, please complete both the SER Vessel Strike form and NOAA Fisheries Southeast Region Protected Species Reporting Form.

Procedures & Actions for Incidental Takes of Marine Mammals in Research & Monitoring Activities

(applies to surveys on NOAA and charter vessels and partner surveys)

Context

While research conducted by NOAA or through NOAA sponsorship is undertaken to support NOAA's various missions, these activities must still comply with applicable statutes and regulations, including those relating to takes of marine mammals under the Marine Mammal Protection Act. When NOAA activities cause a take of a marine mammal, the cruise senior scientist or designee, should take the following actions.

Key Actions

1. Notify the geographically appropriate Regional Stranding Network Coordinator (contact information in this document) immediately following the incidental take of a marine mammal.

2. Regional Stranding Network Coordinator will immediately contact the Office of Law Enforcement (OLE).

3. For live injured/uninjured marine mammals, priority should be to release the animal before notifying Regional Stranding Networks.

4. For dead animals, maximum efforts should be made to retain carcass and coordinate transfer to the Regional Stranding Network.

5. If Coordinators are unreachable, collect pertinent Protected Species Incidental Take (PSIT) information and release animal or retain carcass if logistically feasible.

6. In all cases, within 48 hours of any take, designated NMFS staff shall submit take-related information to the **PSIT Main – NOAA** (website: www.st.nmfs.noaa.gov/finss/psit/psitMain.jsp). Attach narrative, photos, and completed data forms.

***PSIT** – Protected Species Incidental Take Database

NOAA FISHERIES

Pre-cruise Actions

1. Whether onboard a NOAA, chartered, or partner vessel, prior to the cruise, communicate, and coordinate with vessel crew about established protected species incidental take reporting and handling procedures.

2. Ensure regional pertinent protected resources staff are in the PSIT email alert notification list.

3. The NMFS cruise Chief Scientist or Designee shall contact the appropriate Regional Stranding Network and query about additional numbers or specific contacts to reach in case of an incidental take of a marine mammal.

Contact

For any PSIT* or NMFS protected species incidental research take protocol queries, contact:

Dr. Mridula Srinivasan, *NMFS Office of Science and Technology*
301.427.8179
mridula.srinivasan@noaa.gov

What to Do with a Live, Injured or Uninjured Marine Mammal?

If a live, injured or uninjured marine mammal is incidentally captured, the animal should be released immediately. ***In the event of a large entangled whale, immediately call your regional entanglement response network.***

1. Considering human safety, work from the vessel as quickly and carefully as possible to free the animal from the gear. Ensure the animal can continue to breathe while freeing from the gear.

2. If it can be done immediately without further harming the animal, photograph the animal (dorsal and ventral sides including dorsal fin, flanks, head/jaw) prior to and after removal of gear and collect required PSIT information. Research/biological sampling of marine mammals is not permitted without an appropriate Take Authorization.

3. If animal is NOT brought aboard the vessel and taking photos is not an option, provide a comprehensive summary of the incident following requirements described under 'PSIT narrative' in this document.

4. Notify Regional Stranding Network Coordinator immediately after the incident.

5. **Submit take information to PSIT within 48 hours and attach any forms, photos, and narrative to the take record within a week of the event.**

What to Do with a Dead Marine Mammal?

1. Notify Regional Stranding Network Coordinator about the take of a dead marine mammal.

2. Based on any prior discussions with the Regional Stranding Network and importantly, after considering logistics and human safety, make all efforts to haul animal aboard the vessel and retained for pickup by the local Regional Stranding Network. Develop a plan with Regional Stranding Network Coordinator for carcass pickup and subsequent necropsy.

If the animal cannot be hauled aboard or picked up by the Regional Stranding Network Coordinator, as a last resort, release animal after necessary information is collected as described below.

3. Photos of the carcass should be taken: dorsal fin, ventral side, and flank for marine mammals, as well as signs of entanglement, scars, and injuries. This also includes collecting required PSIT data and morphometric measurements.

4. Submit take information to PSIT within 48 hours and attach any forms, photos, and narrative to the take record within one week of the event.

5. Research/biological sampling of marine mammals is not permitted without an appropriate Take Authorization.

What to Do with All Marine Mammals?

In addition to the required PSIT information (date, gear, location, etc.) please complete a narrative which includes the following information. A completed narrative is essential for serious injury determinations.

1. Animal Condition (include photos)

Code 1	Code 2	Code 3	Code 4
Live Animal	Fresh Dead	Moderate Decomposition	Advanced Decomposition

2. Mention if animal escaped or was released.

3. Indicate if the animal or other marine mammals were seen in the vicinity of the vessel during fisheries operations.

4. Animal condition post-release: Describe any observed injuries, the condition and behavioral state of released or injured animal (e.g., no obvious injuries and animal swam away vigorously, did not swim away vigorously, animal surfaced to breathe, animal sank to bottom, or blood in water observed).

5. If gear was still attached to animal after release, describe how the gear was cut and approximately how much gear is left and where it is still entangled/injured.

6. Provide comprehensive photographic evidence (if possible) and written description of live/dead or injured animal. Provide pictures of how the animal was entangled in the gear, and any gear-related interactions such as wounds or constrictions.

7. Decision-making: Include rationale for any discretionary decisions taken by Chief Scientist/crew.

8. Describe possible causes for incidental capture of the animal and any additional mitigation measures that were taken, or might be taken to prevent similar captures in the future.

Regional Stranding Response Coordinator 24/7 Hotline Numbers

*(**for marine mammals**) are provided below. The relevant number should be included in your cruise plan and posted on the ship for easy access.*

*For **all non-marine mammal** takes, designated personnel shall report takes to PSIT within 48 hours of take.*

Northeast Region	1.866.755.6622
Southeast Region	1.877.433.8299
Western Region	1.866.767.6114
Pacific Islands Region	1.888.256.9840
Alaska Region	1.877.925.7773 **NMFS Stranding Coordinators** Aleria Jensen | 907.586.7248 and Barbara Mahoney | 907.271.3448 (cell – after hours | 907.360.3481) **General NMFS Protected Resources Office Line** | 907.586.7235 Kate Wynne (NMFS Kodiak) | 907.486.1517

Entanglement Response Network Numbers

Southeast Region	1.877.433.8299 or 1.877.942.5343
Northeast Region	1.866.755.6622 For large whale entanglements can also contact USCG via Channel 16.
Western Region	1.877.767.9425 (877-SOS-WHALE)
Pacific Islands Region	1.888.256.9840
Alaska Region	1.877.925.7773

MARINE MAMMAL
HANDLING/RELEASE GUIDELINES
A Quick Reference for Atlantic Pelagic Longline Gear

GUIDELINES FOR ALL MARINE MAMMALS

- Have an identification guide, paper, and camera ready at all times in case of an interaction.
- Document as much information as possible to describe the marine mammal, particularly physical appearance and potential injuries:
  - Animal's length
  - Animal's features to be used for species identification (color pattern, dorsal fin shape, head shape)
  - Any gear remaining on the animal (type, placement, color, size, etc.)
  - Any existing tags on the animal (description, tag number)
- Take photographs from different angles. Pictures of the head, dorsal fin, and tail are most helpful in species ID. Fishermen should submit these photos to NMFS Office of Protected Resources, along with the NMFS Marine Mammal Injury/Mortality Reporting Form (see below).
- Attempt to release the animal with minimal injury (see below).
- After an interaction with a marine mammal:
  - Remove remainder of the gear from the water
  - Move at least one nautical mile away to avoid further interactions
  - Alert other fishermen in the area to the presence of marine mammals
  - Record all injuries and mortalities of marine mammals within 24 hours of returning to shore on the NMFS Marine Mammal Injury/ Mortality Reporting Form
- Reporting Requirement: Submit the Marine Mammal Injury/Mortality Reporting Form by fax to (301) 427-2522, or by mail: NMFS Office of Protected Resources Attn: MMAP, 1315 East West Highway, Silver Spring, MD 20910. Additional copies of the reporting form may be requested from the same address, or found online at: http://www.nmfs.noaa.gov/pr/pdfs/interactions/mmap_reporting_form.pdf.

GUIDELINES FOR SMALL MARINE MAMMALS

- Ensure the crew is ready to assist.
- Avoid abrupt actions or vessel movements that may panic the animal.
- As soon as the opposite side of the mainline is available, use two long gaffs to recover it. DO NOT USE GAFFS OR SHARP OBJECTS in direct contact with the animal. A gaff should be used only to control the line.
- Move the vessel cautiously, STOP THE VESSEL within range of the marine mammal.
- Gently bring the marine mammal alongside the vessel.
- If a tangle exists:
  - Gaff the other side of the mainline and attach it to the vessel or float ball to isolate the vessel and marine mammal from any tension on the remaining gear in the water
  - Work the tangle off the marine mammal as smoothly and quickly as possible
- If the animal is hooked:
  - Use a NMFS-approved dehooking device
  - Cut the barb off the hook with long-handled bolt cutters
  - Cut the line with line cutters as close to the hook as possible
- Remove as much line as possible from the animal.
- DO NOT use a tether, ninja sticks, or sea turtle dehooking or disentangling devices to control the animal.

GUIDELINES FOR LARGE WHALES

- If a large whale is alive and entangled in fishing gear, contact the Provincetown Center for Coastal Studies Disentanglement Hotline at (800) 900-3622 or immediately contact the U.S. Coast Guard at VHF Ch. 16 for instructions.
  - Maneuver the vessel in such a way as to minimize tension on the line
- If a large whale is dead and on the line, immediately contact the U.S. Coast Guard at VHF Ch. 16 for instructions.

SAFETY FIRST!

Hooked or entangled marine mammals can be unpredictable. There are inherent human safety concerns associated with handling/disentangling marine mammals. Be prudent and safe on the water. Human safety is paramount.

GET A MOVE ON!

If you have one marine mammal interaction, there is a high likelihood that you will have additional encounters if you continue fishing in the same area. Alert other fishermen via radio communication and MOVE, or wait 48 hours to reset gear rather than risk further interactions.

This placard meets the regulatory requirements of 50 CFR 229.36(c).

(727) 824-5312 • www.nmfs.noaa.gov

Version May 2013

Right Whale or Other Large Whale Vessel Strike Report Form

Incident Date (mm/dd/yyyy): ____/____/____

Incident Time (local): _____

Location

Latitude ____º____.___’ **N**

Longitude ____º____.___’ **W**

How lat/long determined: _____

Area Description: _____

_____

_____

_____

_____

Weather/ Environmental Conditions

Lighting:

☐ Day ☐ Night ☐ Twilight

Weather/ Precipitation:

☐ Clear ☐ Rain ☐ Fog ☐ Snow

☐ Other: _____

Visibility

☐ Good ☐ Fair ☐ Poor

Est. Visibility Distance: _____

Air Temp.: _____ ☐ ºC ☐ ºF

Wind Speed (knots): _____ **Direction (deg):** _____º

Wave Height: _____ **Swell:** _____ ☐ m ☐ ft

Water Depth: _____ ☐ m ☐ ft

Vessel Information

Vessel Make: _____

Vessel Model: _____

Vessel Length: _____

Engine Make/Model: _____

Engine HP: _____

Propeller

Diameter: _____ **Pitch:** _____

No. Blades: _____

Distance between prop shafts

(center to center): _____

Navigation Information at Time of Incident

Vessel Activity:

☐ Moored, anchored, or fixed ☐ On plane

☐ Underway, but off plane ☐ Drifting

Autopilot: ☐ On ☐ Off

Vessel Speed (knots): _____

How Determined _____

Engine RPMs: _____

Vessel Course (degs.) _____º

Position/ Location of Watchstanders:

☐ Bridge ☐ Bow ☐ Other: _____

No. of Watchstanders: _____

Incident Information

Part of Vessel that struck whale(s):

☐ Bow ☐ Propeller ☐ Unknown ☐ Other: _____

Observations of whale(s):

☐ Swam away ☐ Floating/ moving slowly at surface ☐ Never saw the whale ☐ Blood in water

☐ Other/ Additional observations: _____

_____

Incident Information (continued)

Description of what was seen, heard, etc.:

_____
_____
_____
_____
_____

Description of impact relative to sandbar, container, etc.:

_____
_____
_____
_____
_____

Description of damage to vessel:

_____
_____
_____
_____
_____

Comments on how collision may have been avoided:

_____
_____
_____
_____
_____

Additional Remarks:

_____
_____
_____
_____
_____

Compliance Guide for Right Whale Ship Strike Reduction Rule (50 CFR 224.105)

ATTENTION: All vessels greater than or equal to 65 ft (19.8 m) in overall length and subject to the jurisdiction of the United States and all vessels greater than or equal to 65 ft in overall length entering or departing a port or place subject to the jurisdiction of the United States.

YOU MUST SLOW TO SPEEDS OF 10 KNOTS OR LESS IN SEASONAL MANAGEMENT AREAS

NOAA FISHERIES SERVICE

Mandatory speed restrictions of 10 knots or less are required in Seasonal Management Areas along the U.S. East Coast during times when right whales are likely to be present. The purpose of this regulation is to reduce the likelihood of deaths and serious injuries to these endangered whales that result from collisions with ships.

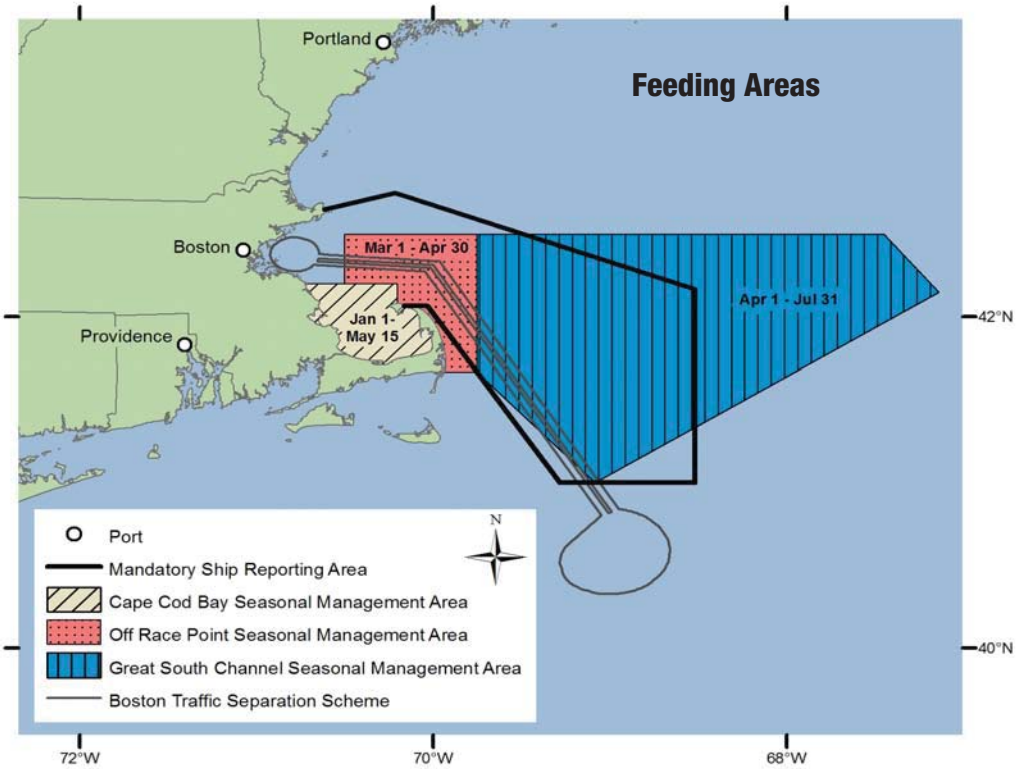
NOAA

Vessels may operate at a speed greater than 10 knots only if necessary to maintain a safe maneuvering speed in an area where conditions severely restrict vessel maneuverability as determined by the pilot or master.

If a deviation from the 10 knot speed restriction is necessary, the following information must be entered into the logbook:

- Reasons for deviation
- Speed at which vessel is operated
- Latitude and longitude at time of deviation
- Time and duration of deviation
- Master of the vessel shall sign and date the logbook entry

Northeast U.S. Seasonal Management Areas



Feeding Areas

Cape Cod Bay
January 1 - May 15
Includes all waters of Cape Cod Bay with Northern Boundary of 42º04'56.5"N, 070º12'W to 42º12'N, 070º12'W then due west back to shore.

Off Race Point
March 1 - April 30
Waters Bounded by:
42º04'56.5"N 070º12'W
42º12'N, 070º12'W
42º12'N, 070º30'W
42º30'N, 070º30'W
42º30'N, 069º45'W
41º40'N, 069º45'W
then due west back to shore.

Great South Channel
April 1 - July 31
Waters Bounded by:
42º30'N, 069º45'W
42º30'N, 067º27'W
42º09'N, 067º08'24"W
41º00'N, 069º05'W
41º40'N, 069º45'W
then back to starting pt.

The rule does not apply to waters inshore of COLREGS lines.

Migratory Route

November 1 through April 30

Vessel speed is restricted in the following areas:

- Block Island Sound waters bounded by:
  40º51'53.7" N 070º36'44.9" W
  41º20'14.1" N 070º49'44.1" W
  41º04'16.7" N 071º51'21.0" W
  40º35'56.5" N 071º38'25.1" W
  then back to starting point.
- Within a 20 nm (37 km) radius of the following (as measured seaward from the COLREGS lines):
  - -Ports of New York/New Jersey:
    40º29'42.2"N 073º55'57.6"W
  - -Entrance to the Delaware Bay (Ports of Philadelphia and Wilmington):
    38º52'27.4"N 075º01'32.1"W
  - -Entrance to the Chesapeake Bay (Ports of Hampton Roads and Baltimore):
    37º00'36.9"N 075º57'50.5"W
  - -Ports of Morehead City and Beaufort, NC:
    34º41'32.0"N 076°40'08.3"W
- Within a continuous area 20 nm from shore between Wilmington, NC, to Brunswick, GA, bounded by the following:

Point	Latitude	Longitude
A	34º10'30"N	077º49'12"W
B	33º56'42"N	077º31'30"W
C	33º36'30"N	077º47'06"W
D	33º28'24"N	078º32'30"W
E	32º59'06"N	078º50'18"W
F	31º50'00"N	080º33'12"W
G	31º27'00"N	080º51'36"W

and west back to the shore.

Calving and Nursery Grounds

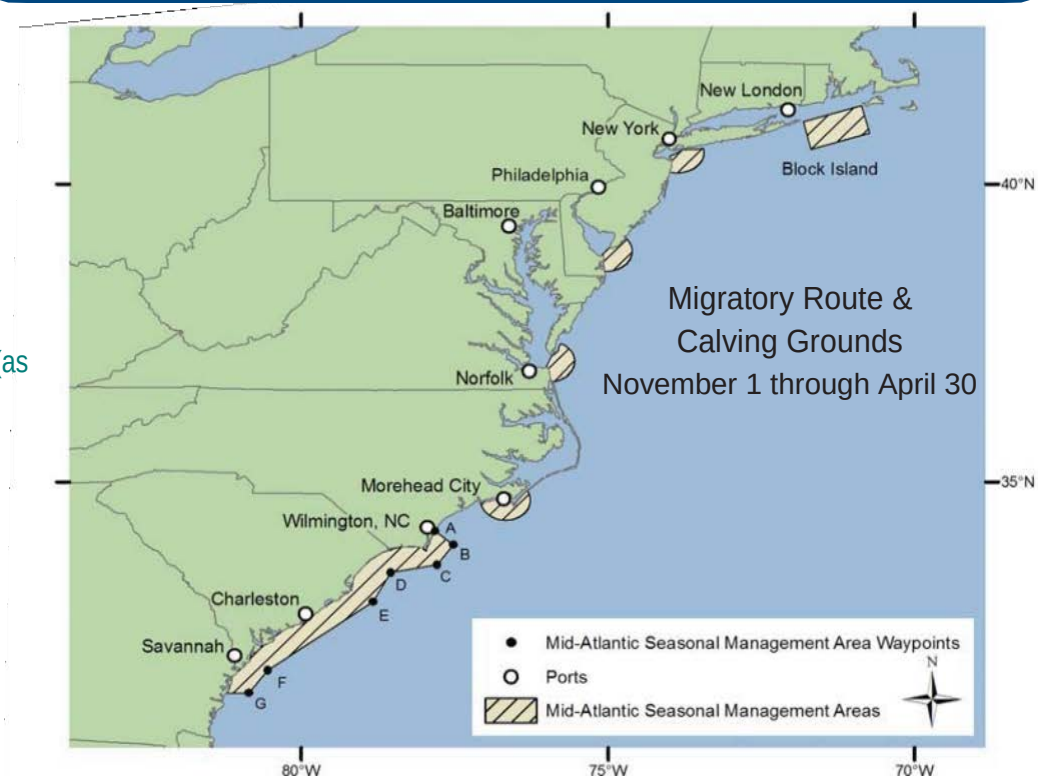
November 15 through April 15

Vessel speed is restricted in the area bounded to the north by latitude 31º27'N; to the south by latitude 29º45'N; to the east by longitude 080º51'36"W.

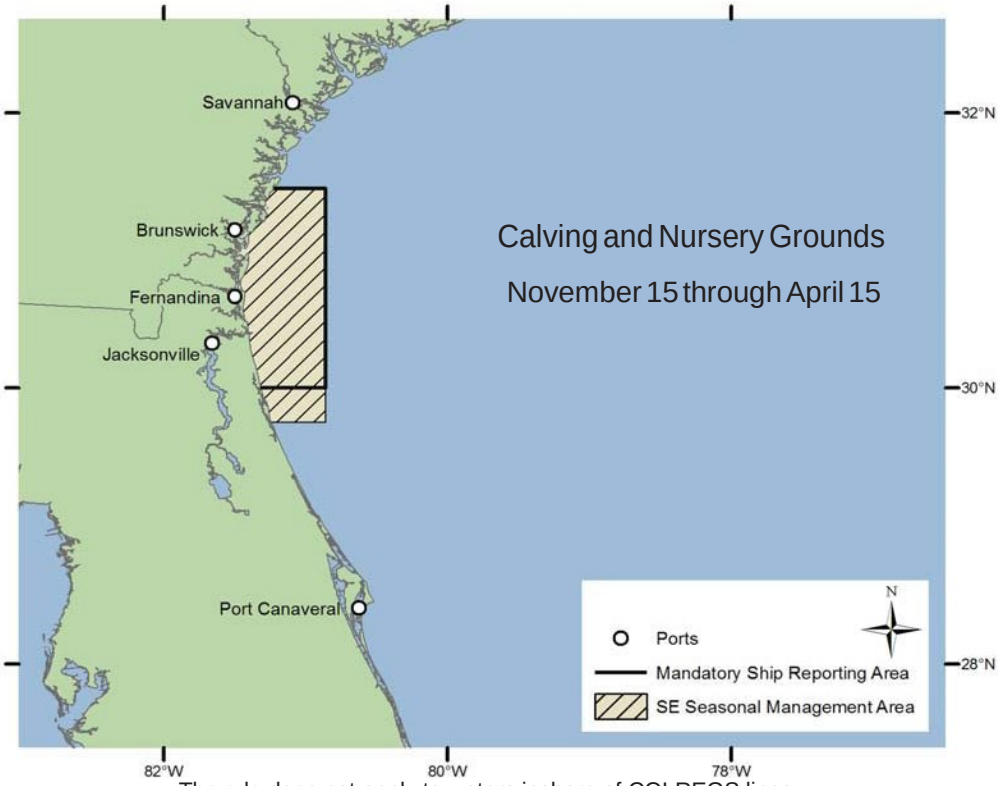
For more information, visit:
http://www.nmfs.noaa.gov/pr/shipstrike
http://nero.noaa.gov/shipstrike
http://rightwhalessouth.nmfs.noaa.gov

Right Whale Ship Strike Reduction Rule expires on December 9, 2013

Mid-Atlantic U.S. Seasonal Management Areas



Southeast U.S. Seasonal Management Area



The rule does not apply to waters inshore of COLREGS lines.

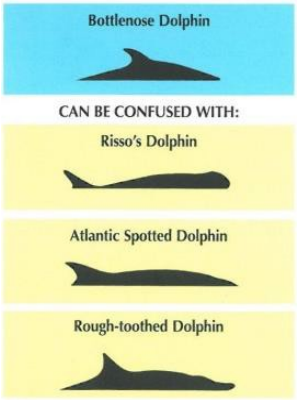
Voluntary Dynamic Management Areas (DMAs) may also be established by NOAA Fisheries Service. Mariners are encouraged to avoid these areas or reduce speeds to 10 knots or less while transiting through these areas. NOAA Fisheries Service will announce DMAs to mariners through its customary maritime communication media.

This serves as NOAA's small entity compliance guide.

OMB Control #0648-0580

Most Common Marine Mammals of the Gulf of Mexico, Atlantic and Caribbean in waters < 200 m deep

Bottlenose dolphin (*Tursiops truncatus*)



SIZE: Adult size varies considerably: 1.9–3.6 m (6-12 ft), 140-650 kg. At birth approx. 1 m (3 ft), 25 kg.

BODY: Robust body and head. **Short, thick, well defined beak.** Two "ecotypes" are recognized: **"Coastal Form"** is shorter and slimmer than larger **"Offshore form."** Flippers pointed, flukes deeply notched.

COLOR: Highly variable: blue-gray to brown with lighter sides and belly. **No distinctive color pattern.** Some have spots, pale shoulder blaze, or cape.

DORSAL FIN: Tall, falcate, with broad base; located mid-back.

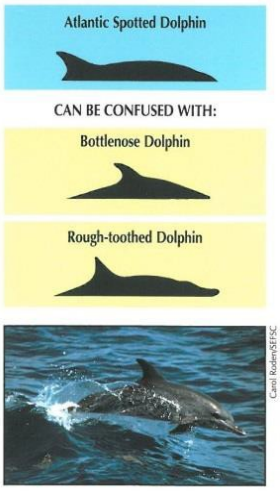
BEHAVIOR: Coastal form: small groups <10; offshore form: groups of 10s to 100s. Acrobatic: breach, spyhop, lobtail. Often seen with pilot whales and right whales (in FL, GA).

DIVE PATTERN: Max dives of 3–4 min. **Beak rarely visible when surfacing.**

HABITAT: Coastal form: shallow, warm, in-shore waters of bays and rivers. Offshore form: deep offshore waters of shelf edge and slope.

Source: Guide to Marine Mammals & Turtles of the U.S. Atlantic & Gulf of Mexico by K. Wynne & M. Schwartz Layout: M. Cook, National Marine Fisheries Service

Atlantic spotted dolphin (*Stenella frontalis*)



SIZE: Adults 2.1–2.3 m (7–7.5 ft), 140 kg. At firth approx. 1 m (3 ft).

BODY: Fairly robust body with moderate keel. **Long, thick, white-tipped beak.** Flippers curved and pointed. Coastal animals larger and more spotted than offshore animals.

COLOR: **Tricolored background:** dark purplish gray back and cape, light gray sides, white belly. **Pale blaze** often sweeps up from side toward dorsal fin. **Variable spotting:** born unspotted, develop spots with age that may obliterate background color. **White tipped beak. Tail stock single color**, pales with age.

DORSAL FIN: Tall, dark falcate; located fid-back.

BEHAVIOR: Gregarious; coastal groups of <20, offshore groups usually <100. Associate with other dolphins and small whales.

DIVE PATTERN: Tip of beak breaks surface first. Fast, acrobatic; avid bowrider.

HABITAT: Coastal to pelagic. Tropical to warm-temperate waters over continental shelf, edge, and upper reaches of slope. Associated with Gulf Stream n. wall and warm core rings.

SOUTHEAST REGION PROTECTED SPECIES INCIDENTAL TAKE REPORTING FORM INSTRUCTIONS

October 2014

By
Melissa Cook[1]
Brandi Noble[1]
Andrew Herndon[2]
Stacey Horstman[2]

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Mississippi Laboratories
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Pascagoula, MS 39567

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Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

Point of Contact:
For questions regarding incidental takes, the Protected Species Incidental Take form or instructions contact:
SEFSC surveys: Brandi Noble Brandi.Noble@noaa.gov (228) 549-1636
State/Academic surveys: Andrew Herndon Andrew.Herndon@noaa.gov (727) 824-5312

For questions regarding the National Environmental Policy Act Environmental Assessment (NEPA EA):
Melissa Cook Melissa.Cook@noaa.gov (228) 549-1628

For questions regarding the Marine Mammal Protection Act Letter of Authorization (LOA) for incidental takes: Keith Mullin Keith.Mullin@noaa.gov (228) 549-1632

Southeast Region Protected Species Incidental Take Reporting Form Instructions

INTRODUCTION

The Southeast Region Protected Species Incidental Take (PSIT) Reporting Form, version 1.3 10/2014 (Appendix A) is used to record vessel/trip information, gear characteristics and interaction information, and biological data of protected species (e.g. sea turtles, sawfish, marine mammals, etc.) incidentally captured during fishery independent sampling. Other data collected, such as biological information, tagging data and biopsy samples are critical to the development of conservation and recovery strategies for protected species. Only trained and authorized personnel may collect the biological information indicated on this form.

When conducting research, authorized personnel must carry all relevant permits and authorization letters and follow all terms and conditions, including reporting requirements, as outlined in the permit(s).

GENERAL INSTRUCTIONS

Complete one Southeast Region Protected Species Incidental Take Reporting Form for each protected species (i.e., marine mammals, sea turtles, sturgeon and sawfish) captured. If possible, photograph the gear interaction prior to removal. Try to photograph all specimens, including those hooked or entangled that are not brought aboard due to their large size and/or for safety reasons. Photographs are used to confirm species identification and document the gear interaction. Record tag data, if tags are present, and take biological samples if requested and authorized. Note the amount of writing required when completing the form has been minimized by offering drop-downs and options to check a box, although some questions require a written response. **If an answer is not available in the drop-down list you may type in your response. For many fields, hovering over the blank box will further describe the requested information required.**

Report all marine mammal incidental takes immediately. Marine mammal entanglements (live or dead) and vessel strikes must be reported immediately to the NOAA Fisheries Marine Mammal Stranding Hotline at 1-877-433-8299. All applicable reporting forms should be sent within 24 hours.

Please submit completed PSIT Form and photographs within 24 hours to nmfs.ser.ea_loa.takereport@noaa.gov. Please enter Fisheries Independent Monitoring Protected Species Take (BiOp SER-2009-7541) in the subject line and include the project name and species in the text of the email.

Please fill out the following required fields for each incidentally captured protected species. All required fields are outlined in red on the instructions and PSIT form. If red outline is not visible, select Highlight Fields, located in the purple instructions section of the form.

REPORTER INFORMATION

Reporting Agency (required): Select name from the list or enter your agency's abbreviations.

Project/Survey Name (required): Select the name of your project from the list.

VESSEL/TRIP INFORMATION

Vessel Name/ID (required): Record vessel name or identification number.

Cruise/Trip # (required): Record the survey cruise/trip #.

Station/Site # (required): Record the station/site #. Please do not leave blank.

Collection #: If you assign a unique number for a specimen please record it here.

Specimen # (required): Record a three digit consecutive number for each protected species captured on that cruise. Enter 001 for the first capture and number sequentially for each additional animal caught (regardless of species). Protected species specimen numbers are kept separate from all other specimen numbers for other species groups. Example: if two turtles were captured, regardless of species, in one net then it should be 001 and 002, if a sturgeon was captured on the next station it would be number 003 and so on.

Vessel Size (required): Select the size (in feet) of the vessel from the list.

Unique Identifier (assigned by NMFS): Please leave blank, automatically populated. Identifier is composed of the Agency abbreviations, capture date (year, month, day), station number and specimen number. Each field is separated by a hyphen. Ex. NMFS-20141023-100-01.

The following section describes the gear used in the sampling activity involved in the protected species interaction. Please complete all applicable fields.

GEAR CHARACTERISTICS

TRAWL GEAR

Trawl Type: Select type of trawl from the list or enter trawl type if not listed.

Headrope Length (ft): Record the headrope length in feet. Length is measured between the points at which the ends of the headrope are attached to the trawl net, measured along the forward-most webbing.

Footrope Length (ft): Record the footrope length in feet. Length is the distance between the points at which the ends of the footrope are attached to the trawl net, measured along the forward-most webbing.

# of Nets: Select the total number of nets pulled at that specific station.

TED Present: Indicate whether or not a turtle excluder device (TED) was installed in the net the capture occurred by selecting Yes or No from the list.

Trawl Body: Select from the list the type of material from which the trawl body is constructed and record the *stretched* mesh size in inches.

Cod End: Select from the list the material type from which the cod end of the trawl is constructed and record the *stretched* mesh size in inches.

Ground Gear: Indicate the length of the ground gear (i.e. tickler chain, cookies, wheels, etc.) in feet and record its size in inches.
Doors**:** Select from the list the type of material type from which the trawl doors are constructed. Also include the length and height of the door in feet.

Lazy Line: Select from the list the type of material type from which the lazy line is made.

Net Sampling Location: Refers to the general sampling location of where the net is fishing in the water column. Please select the appropriate classification from the list.

Net Sampling Depth: Enter the actual depth in the water column where the net was fishing. For trawls fishing on the bottom entering the bottom depth is appropriate. For midwater trawling, enter the depth where the net was fishing.

OTHER NET TYPES: SEINE/GILLNET/TRAMMEL/FYKE NETS

Other Net Types: Select the type of non-trawl net used from the list or enter trawl type if not listed.

Seine/Gillnet/Trammel Net – Floatline Length: Record the floatline length in feet and the diameter in inches.

Seine/Gillnet/Trammel Net – Leadline Length: Record the leadline length in feet and the diameter in inches.

Fyke Net – Leader Length: Record the leader length in feet.

All Net Types Mesh – Material Type: Select from the list the type of material from which the net is constructed.

All Net Types Mesh – Twine Size: Record the twine size of the net in inches.
Gillnet – Net Sampling Location: Refers to the general sampling location of where the net is fishing in the water column. Please select the appropriate classification from the list.

Gillnet – Mode of Fishing: Refers to the more general type of gillnet fishing (i.e., anchored, drift, or encircling). Please select the appropriate method from the list.

Gillnet – # of Panels: Record the total number of mesh panels making up a net, even if they are of different mesh sizes. Please select the appropriate number from the list.

Gillnet – Length (ft): Record the length of the panel in feet.

Gillnet – Height (ft): Record the height of the panel in feet.

Gillnet – Spacing (ft): Record the distance between each panel in feet. If there is no distance between the panels, record the distance as 0.

Gillnet – Mesh Size (in): Record the *stretched* mesh size for each panel in inches. Even if the mesh sizes are the same, record it for each panel.

LONGLINE/HOOK-AND-LINE GEAR

Hook and Line Type: Select from the list the type of hook-and-line gear used.

Mainline Length (m): Record the length of the mainline in meters.

Mainline Test (lb): Record the test of the mainline in pounds.

Mainline Line Type: Select from the list the material type of the mainline.

Gangion Length (m): Record the length of the gangions in meters.

Gangion Test (lb): Record the test of the gangions in pounds.

Gangion Line Type: Select from the list the material type of the gangions.

Vertical Line/Bandit Reel ONLY – Backbone Length (m): Record the length of the gangions in meters.

Vertical Line/Bandit Reel ONLY – Backbone Test (lb): Record the test of the gangions in pounds.

Vertical Line/Bandit Reel ONLY – Backbone Line Type: Select from the list the material type of the gangions.

Bait Type: Select from the list the type of bait used. If multiple bait types or a type of bait not listed is used, please describe the bait(s) used in the space provided.

Hook Size: Check the box for the appropriate size(s) of hook, (e.g., 9/0, 18/0). If using multiple hook sizes, check all that apply.

Hook Type: Select "J" or Circle from the list.

 # Gangions: If using longline, bandit or vertical line gear, record the total number of gangions used.

Rod and Reel ONLY – Hooks/Line: Record the number of hooks per line.

Manufacturer: Select from the list the manufacturer of the hooks used (e.g. Mustad) or enter if not on the list.

Style No.: Record the style number of the hooks used (e.g., Mustad #39968D).

Offset: Record the degree of hook offset (e.g., 0°, 5°, 10°).

ALL OTHER GEAR: Please record any other fishing gear used that was not included in previous sections.

The following sections describe the capture, identification, interaction, biological information and release of the species involved in the interaction. Please complete all applicable fields. All required fields are outlined in red on the instructions and form.

CAPTURE INFORMATION

Start of Set Date (required): Record the date of the start of the set.

Start of Set Time (required): Record the starting time of the set. This may vary depending on type of gear used. Ex. Trawl, gillnet/trammel net and hook & line - when the gear reaches its fishing depth, longline - when the last highflyer enters the water. Record the time using 24-hour (HHMMSS) notation of the start of the set. Enter time as six digits and do NOT use punctuation (ex. 091530).

Start of Set Zone (required): Select from the list the time zone (GMT or local) used for recording the time for the Start of the Set.

End of Set Date (required): Record the date of the end of the set.

End of Set Time (required): Record the ending time of the set. This may vary depending on type of gear used but it is typically when gear haul back begins. Ex. Trawl, gillnet/trammel net and hook & line - when haul back begins, longline - when the first high flyer is retrieved. Record the time using 24-hour (HHMMSS) notation of the end of the set. Enter time as six digits and do NOT use punctuation (ex. 091530).

End of Set Zone (required): Select from the list the time zone (GMT or local) used for recording the time for the End of the Set.

Standard Soak Time (min) (required): The target amount of time in minutes that the gear is typically soaked in the water based the survey's sampling protocol.

Soak Time (calculated by NMFS) (required): The amount of time the gear actually soaked in the water. Calculated from start and end of set fields.

Water Depth (m) (required): Record the maximum water depth in meters at the location where the animal was captured.

Surface Water Temperature (°C): Record the surface water temperature in Celsius at the location where the animal was captured.

Capture Latitude (DD.DDDD) (required): Record, using decimal degrees, the latitude at the time of the actual recovery of the animal.

Capture Longitude (DD.DDDD) (required): Record, using decimal degrees, the longitude at the time of the actual recovery of the animal. Remember longitude is negative in the western hemisphere.

Capture Date (required): Record the date the animal was captured.

Capture Time (24 hr) (required): Record the time the animal was captured using 24-hour (HHMMSS) notation. Enter time as six digits and do NOT use punctuation (ex. 091530).

Capture Zone (required): Select time zone (GMT or local) from list - for recording the capture time.

Marine Jurisdiction (required): Select the jurisdiction in which the vessel was fishing when the capture occurred. If the incidental capture occurred in state waters please select which state waters or choose Federal if the capture occurred in federal waters.

Animal Boarded? (required): If the captured animal was brought on the vessel select Yes. If the animal was kept in the water and not brought on the vessel select No.

Condition of animal at time of capture (required): Select the appropriate description that best corresponds to the captured animals' condition when it was recovered. On the diagram(s) on page 4, record specific notes about any previous/healed injuries and injuries due to the interaction.

- **Alive, Injured:** The animal is alive and injured. Any fresh lesion or abrasions from the interaction constitutes an injury.
- **Alive, Uninjured:** The animal is alive and visually does not appear to be injured from the related interaction, and there are no fresh lesions or abrasions.
- **Comatose/Unresponsive:** Select this category if the animal is comatose/unresponsive and/or if there is any indication of life but no obvious movements or breaths.
- **Fresh Dead:** The animal appears to have died as a direct result of incidental capture in the current research or looks like it has died within the last 24 hours. The carcass may show signs that it had been alive during the interaction (e.g., multiple wrap entanglement in line or netting, or internal hooking). The carcass may or may not have rigor mortis.
- **Previously Dead:** "Dead before interaction". The animal obviously died prior to and not as a result of the observed fishing interaction. A previously dead animal will usually have rotting tissue around the eyes and vents, and it may be bloated and foul smelling. It also may have sloughing skin/scutes/scales. However, it may not smell, but may have rigor mortis.
- **Unknown:** The scientist cannot determine if the animal is injured or cause of death cannot be determined. This may happen when an animal is not boarded, and no one got a good view of the animal. If the animal is dead and it cannot be determined if fresh or previously dead select Unknown and note comments and uncertainties in the Additional Comments section on page 3.

If comatose/unresponsive, attempted resuscitation? Choose Yes or No to indicate whether resuscitation was attempted. Record in the Additional Comments section on page 3, the time it took for the animal to respond and how long the animal was kept on deck before release. For sea turtles, Resuscitation Guidelines are described in the Federal Register (66 FR 67495, December 31, 2001) and in Chapter 3 of the Sea Turtle Research Techniques Manual.

IDENTIFICATION

Species (required): Select the species of captured animal from the list. If you are unable to identify the species with certainty, try to take photographs and record the species to the lowest possible taxa.

Confidence in species ID (required): Select from the list Good, Fair or Poor to indicate confidence in species identification.

Photographs taken? (required): Select from the list Yes or No as to whether photos of the captured animal were taken. Please attempt to photograph every animal if it does not jeopardize the health and safety of the animal. Take as many photos as necessary to: (1) confirm species identification and (2) document the gear interaction.

Number of Photos: Record the number of photos taken. *If applicable, do not leave blank.*

Video taken? (required): Select from the list Yes or No as to whether video of the captured animal was taken.

Contact Info for Photos/video (person, email): Provide the name and email address of the person possessing the original photographs and/or video.

GEAR INTERACTION

***ALL NET GEAR*:**

Capture Location in Gear: Indicate the section of gear where the animal was captured or entangled. Select all answers that apply, as animals may interact with multiple parts of the gear. If entangled in the body of the gear, record the stretched mesh size of the webbing in inches. If the gear location is not listed on the form, check the "other" box and describe the location of the gear where the animal was captured.

Entanglement Location on Animal: Indicate the location on the animal's body where the gear was entangled. Select all answers that apply as gear may interact with/entangle on multiple parts of the animal. If not entangled in net, leave blank. *Please also indicate exact location of gear interaction on the appropriate diagram on page 4.*

Gear left on Animal? For each location selected above where the animal was entangled, select Yes or No if any gear was left on the animal at the time of release (for live animals only). For example, if tail/fluke is checked as the location on the body where the animal was entangled, indicate whether gear was left on the tail/fluke when the animal was released by selecting Yes or No.

How much? Estimate the length of gear remaining on each entanglement location at the time of release. Select the units of measurement (centimeters, meters, feet, inches).

ALL LONGLINE/HOOK AND LINE GEAR:

Capture Location in Gear: Indicate the location of the gear where the animal was entangled and/or hooked. Select all answers that apply as animals may interact with multiple parts of the gear. If selecting "hooked", please also select the size of hook from the list. If the gear location is not listed on the form, check the "other" box and describe the location of the gear interaction.

Entanglement Location on Animal: Indicate the location on the animal where the gear was entangled. Select all answers that apply as gear may interact with multiple parts of the animal. *Please also indicate the exact location of gear interaction(s) on the appropriate diagram on page 4.*

Gear left on Animal? For each location selected above where the animal was entangled/hooked, select Yes or No if any gear was left on the animal at the time of release (for live animals only). For example, if tail/fluke is checked as the location on the body where the animal was entangled/hooked, indicate whether gear was left on the tail/fluke when the animal was released by selecting Yes or No.

How much? If there was any location on the animal in which gear was left, estimate the length of gear remaining on each entanglement location at the time of release. Select the units of measurement (centimeters, meters, feet, inches) for estimated length of fishing line remaining. For hook and line fisheries, the measurement begins at the eye of the hook, includes the crimp, and all line left on the animal.

If Hooked, Hook Location on Animal: For hooked animals, select **all** locations where the animal is observed to be hooked or may be hooked (both internal and external) if they can be determined. If a specific jaw or mouth location cannot be determined, note the general location of the hook by checking the beak/mouth box. If the hooked location is not listed on the form, check the "other" box and describe the location on the animal where it was hooked. Please also n*ote the hook location in the appropriate diagram on page 4. Indicate if there is more than one hook involved in the Additional Comments section at the bottom of page 3.*

BIOLOGICAL INFORMATION

Length Measurements

Use measuring tape, calipers, and a scale to record the following measurements. Select the units used to take the measurement. If the animal cannot be measured, estimate the total length and check the estimated box.

Finfish (Other than Sawfish)
Total length – Using a measuring tape, record the straight distance from the tip of the nose to the end of the tail. Do NOT compress the tail.

Fork length – Using a measuring tape, record the straight distance from the tip of the rostrum/nose to the notch in the tail.

Sawfish
Total length – Using a measuring tape, record the straight distance from the tip of the rostrum to the dorsal caudal fin by stretching/compressing the fin away from the body.

Marine Mammals
Total length – Using a measuring tape, record the straight distance from the tip of the rostrum to the notch of the fluke.

Sea Turtles
Curved carapace length (cm): Using a measuring tape, record the distance between the center of the nuchal scute and the end of the longest post-central scute **(notch-to-tip)**, following the curvature of the

dorsal center line. On leatherbacks the measurement is taken alongside (not over the top) of the vertebral (center) ridge.

Curved carapace width (cm): Using a measuring tape, record the maximum distance between the lateral edges of the carapace, measured over the curvature of the shell, perpendicular to the center line of the carapace, at the widest point. On leatherbacks, the width is measured from side ridge to side ridge at the widest point.

Straight carapace length (cm): Using calipers, record the distance between the center of the nuchal scute and the end of the longest post-central scute (**notch-to-tip)**. If the animal cannot be measured, estimate the straight carapace length and check the estimated box.

Straight carapace width (cm): Using calipers, record the maximum distance between the lateral edges of the carapace, perpendicular to the center line of the carapace. Note: this measurement may be taken at a different place on the carapace than when measured over the curve with a tape measure.

Weight and Sex: All Incidentally Captured Animals

Weight: If possible, use a scale to weigh the animal and note if units are pounds (lb) or kilograms (kg). If the weight was estimated, mark the estimated box.

Sex: Select from the list if the sex of the animal was M (male), F (female) or unknown.

Tag/ID #

Examine the animals' entire body for existing tags. Multiple tags and different types of tags may appear on the same animal. Animals may have both external and internal tags. For example, sea turtles may have metal or plastic tags located externally on any of the four flippers. Marine mammals, notably bottlenose dolphins, may have a freeze brand near the base of the dorsal fin. Sea turtles, sturgeon and sawfish should be scanned with a passive integrated transponder (PIT) tag reader if one is available.

Tag/ID # 1-4: Record the number of the tag that is already present or that is being applied. If no tags are on the animal and none are applied, leave blank.

For each Tag/ID # (1-4), note each of the following by using the drop-down menu. If response is not listed it may be entered manually in the "other tag" section.

Tag/ID Presence: Choose "*Already present*" if the Tag/ID was in/on the animal prior to the incidental capture; choose "*Applied*" if a Tag/ID was put on by the scientists on the vessel following capture. If the tag is already present, record the return address of the tag in the Additional Comments section. Only trained and permitted individuals may tag incidentally captured species.

Tag/ID Type: Choose from the list the type of tag/ID on/applied to the animal.

Tag/ID Color: Choose from the list the color of the tag/ID on/applied to the animal.

Tag/ID Position: Select from the list the location on the animal's body where the tag was located or applied.

Tags Removed? Select from the list Yes or No to indicate if tags are removed.

-Sea turtles, any tags that are getting hard to read or about to fall off should be removed and replaced with new ones. The removed tags should be collected and provided to the SEFSC Program Coordinator. If existing tags are in good condition, leave them in place.

Other Tags: When other types of tags, not listed above, are present or are applied, record the tag number if it has one. Record details, including position and photograph the tag. If living tags are observed, please describe them here and record details, including position and photograph the mark. Some sea turtles, mainly Kemp's ridleys, may have living tags externally on any of the lateral scutes.

PIT Tag Scan? Select from the list Yes or No, indicating whether you scanned the animal with a PIT tag scanner prior to and after application. Remember when scanning to hold the scanner as close as possible to the animal and keep the reader protected from the wet environment by sealing it in a water proof bag.

-Sea turtles, scan the four flippers, shoulder and "armpit" area with the PIT tag scanner.

-Sturgeon PIT tag placement is typically located to the left of the spine, immediately anterior to the dorsal fin, and posterior to the dorsal scutes. However, it is recommended to scan the entire body surface to ensure it has not been previously tagged.

Samples

Samples Taken: Select from the list Yes, No or Unsuccessful to indicate if any samples were taken from the animal. Dead protected species should be photographed (if possible) and then discarded near the original site of capture. The only exception is sea turtles caught using trawl gear, if appropriately permitted, may be salvaged.

Sample number: Record the sample number for the corresponding sample taken.

Sample Recipient: Record the name of the person receiving the sample at the end of the survey.

Affiliation: Record the affiliation of the person receiving the sample at the end of the survey.

RELEASE INFORMATION

Record the location (latitude and longitude) where the animal was released, the release time, and water temperature at that location. If the entire animal was returned to shore (salvaged or taken to holding facility), leave blank (this is recorded in the Final Disposition section).

Latitude of Release (DD.DDDD): Record, using decimal degrees, the latitude at the time of the actual release of the animal.

Longitude of Release (DD.DDDD): Record using decimal degrees the longitude at the time of the actual release of the animal.

Date: Select the date the animal was released.

Time (24hr): Record the time of day the animal was released using 24-hour (HHMMSS) notation. Enter time as six digits and do NOT use punctuation (ex. 091530).

Zone: Select from the list the time zone (GMT or local) used for recording the capture time.

How was animal released?: Select from the list the best description of how the animal was released or escaped from the gear. *If the animal was cut free from the gear, disentangled, or a hook was removed, please record the equipment used to perform the action in the Additional Comments section on page 3.*

Time taken to release animal (calculated by NMFS): The amount of time it took to release the animal. This will be calculated from the capture and release time. Includes any time spent on sampling (measuring, weighing, etc).

Final Disposition: Record the final disposition (fate) of the animal by checking the appropriate box:

- **Discarded Dead/Comatose/Unresponsive Carcass:** In some cases, an animal may have shown signs of life while onboard, but if it is dead or unresponsive at release, it belongs in this category.
    - **Marked?** Select Yes or No as to whether the carcasses was marked before being discarded. All carcasses returned to sea should be spray painted, tagged, or otherwise marked.
- **Salvaged Carcass/Parts (other than sampled above, list all):** Select this disposition if the carcass or parts of the carcass were salvaged. List all parts saved.
- **Released Alive:** Select if animal was alive upon release.
- **Taken to Holding Facility:** Select if live animal was taken to a holding facility and list facility name and location.
- **Unknown** (explain): If final disposition is unknown please explain.

Behavior upon release: It is extremely important to observe and record the behavior(s) of the animal upon release. Check ALL the appropriate boxes that apply and/or describe the animal's behavior next to "other".

Describe the nature of any injuries caused by the capture and release in the box provided. If the animal was injured as a result of the capture and/or release, it is extremely important to explain and describe the nature of those observed or suspected injuries (i.e. blood in the water, location of bleeding, how much bleeding, cuts/lacerations on body and where, etc.). If wounds were observed on the animal's body, please note these on the appropriate diagram on page 4.

Data Recorder (required): Person responsible for filling out data sheet.

Tagger: Person responsible for handling and tagging animal (if applicable).

Mitigation Measures in place at time of capture: List all mitigation measures followed at the time of capture, and note why other mitigation measures in place for your particular project may not have been followed. Some examples of mitigation measures are limited tow/soak times, turtle excluder devices (TEDs) in trawls, ending soak/tow time if protected species are sighted in sampling area, ending soak/tow time if protected species is observed interacting with sampling gear, use of circle hooks, gear constantly monitored/tended, etc.

Additional Comments: Use this area to record any additional comments, as noted specifically above, or that the recorder feels are important. If resuscitation was attempted on the animal, please record all details in this section (such as length of time resuscitation was attempted, method(s) used, etc.). If the animal was cut free from the gear, disentangled, or a hook was removed, record the equipment used to perform the action.

Diagrams on Page 4: Please note any gear interactions, scars, etc. on appropriate diagrams.
Use these diagrams to annotate any details as specifically noted above and any anomalies, wounds, location of living tags, etc. Also, be sure to indicate locations of all biological samples collected. To annotate the diagrams, on your menu, go to *Tools->Comment and Mark up and* select a drawing tool. Use the typewriter tool to enter text.

Appendix A

Southeast Region Protected Species Incidental Take Reporting Form

Sample NOAA Fisheries Southeast Region Protected Species Incidental Take (PSIT) Reporting Form (Version 1.3, 10/2014), Page 1 of 4
SAMPLE ONLY – Not for Use

NOAA Fisheries

Southeast Region Protected Species Incidental Take Reporting Form

version 1.3 10/2014

REPORTER INFORMATION

Reporting Agency: ____ Project/Survey Name: ____

VESSEL/TRIP INFORMATION

Vessel Name/ID ____ Cruise/Trip# ____ Station/Site# ____ Collection # ____ Specimen # ____ Vessel Size ____ Unique Identifier (generated): ---

If vessel strike, also complete the SER Vessel Strike form and immediately contact 877-433-8299.

GEAR CHARACTERISTICS

Trawl Type ____

Headrope length (ft) ____ # of nets ____ TED present? ____
Footrope length (ft) ____

Trawl Body: material type ____ mesh size (in) (stretched) ____
Cod End: material type ____ mesh size (in) (stretched) ____
Ground Gear: length (ft) ____ size (in) ____

Doors: type ____ length (ft) ____ height (ft) ____
Lazy Line: material type ____

net sampling location (water column) ____ net sampling depth (m) ____

Other Net Types ____

Seine/Gillnet/Trammel: Floatline length (ft) ____ diameter (in) ____ Leadline length (ft) ____ diameter (in) ____
Fyke: Leader length (ft) ____

All Net Types: mesh material type ____ twine size (in) ____

Gillnet: net sampling location (water column) ____ mode of fishing ____

Panels/bags in net: # of panels ____ length (ft) ____ height (ft) ____ spacing (ft) ____
mesh size (in): (stretched) panel 1 ____ panel 2 ____ panel 3 ____ panel 4 ____ panel 5 ____ panel 6 ____

Longline/Hook and Line Type ____

Mainline length (m) ____ test (lb) ____ line type ____
Gangion length (m) ____ test (lb) ____ line type ____
Backbone length (m) (vertical line/bandit reel only) ____ test (lb) ____ line type ____

Hook size (s): (check all that applies)
4/0 11/0
6/0 12/0
7/0 13/0
8/0 15/0
9/0 18/0

hook type ____ hooks/line (rod and reel only) ____
gangions ____

bait type ____
If bait type "other/multiple", please describe ____

Manufacturer ____
Style No. ____ offset ____

All Other Gear (describe): ____

CAPTURE INFORMATION

Start of Set: Date ____ Time (24hr) ____ Zone ____
End of Set: Date ____ Time (24hr) ____ Zone ____

Standard Soak Time (min) ____
Soak Time (calculated) 0

Water Depth (m) ____
Surface Water Temp (°C) ____

Page 1 of 4

Sample PSIT Reporting Form, Page 2 of 4

CAPTURE INFORMATION (Cont.)

Latitude: (DD.DDDD) Longitude: (DD.DDDD)

Date Time (24hr) Zone

Marine Jurisdiction Animal Boarded?

Condition of animal at time of capture

If comatose/unresponsive, attempted resuscitation?

IDENTIFICATION

Species Confidence in species ID

Photographs taken? # of Photos Video taken? Contact Info for photo/video (person, email)

GEAR INTERACTION

ALL NET GEAR:

Capture Location in Gear (check all that applies)	Entanglement Location on Animal (check all that applies)	Gear left on Animal?	How Much?
cod end	beak/neck/head/saw/rostrum		
lazy line	rear flipper/groin/peduncle		
wing extension	front flipper/shoulder/armpit		
in the body mesh size(in) (stretched)	carapace/plastron/body		
near lead line	pectoral flipper		
near float line	dorsal fin		
other (describe):	tail/fluke		
	other (describe):		

ALL LONGLINE/HOOK AND LINE GEAR:

Capture Location in Gear (check all that applies)	Entanglement Location on Animal (check all that applies)	Gear left on Animal?	How Much?
entangled in mainline	beak/neck/head/saw/rostrum		
entangled in floatline	rear flipper/groin/peduncle		
entangled in gangion	front flipper/shoulder/armpit		
entangled in float	carapace/plastron/body		
hooked (size)	pectoral flipper		
other (describe):	dorsal fin		
	tail/fluke		
	other (describe):		

If Hooked, Hook Location on Animal

Internal: (check all that applies)

- beak/mouth jaw location: upper lower side (mouth only)
- mouth location: tongue jaw joint glottis/throat roof of mouth
- swallowed/esophagus (hook visible)
- swallowed/esophagus (hook not visible)
- unknown
- other (describe):

External: (check all that applies)

- beak/neck/head/saw/rostrum
- rear flipper/groin/peduncle
- front flipper/shoulder/armpit
- carapace/plastron/body
- pectoral flipper
- dorsal fin
- tail/fluke
- other (describe):

Page 2 of 4

Sample PSIT Reporting Form, Page 3 of 4

BIOLOGICAL INFORMATION

Measurements

Finfish

total length ____ estimated

fork length ____ estimated

Marine Mammals

total length ____ estimated

Sea Turtles

curved carapace length (cm) ____

curved carapace width (cm) ____

straight carapace length (cm) ____ estimated

straight carapace width (cm) ____

All Incidentally Captured Animals

Weight ____ estimated

Sex ____

Tag/ID #

	Tag/ID Presence	Tag/ID Type	Tag/ID Color	Tag/ID Position	Tags Removed?
Tag/ID #1					
Tag/ID #2					
Tag/ID #3					
Tag/ID #4					

Other tag (describe) ____ PIT scan? ____

Samples

Samples Taken	Type	Sample Number	*Final Disposition* Person	Affiliation
	blood			
	fin clip			
	tissue			
	carcass			
	other (describe):			

RELEASE INFORMATION

Latitude: (DD.DDDD) ____ Longitude: (DD.DDDD) ____

How was animal released? ____

Date ____ Time (24hr) ____ Zone ____

Time taken to release animal (calculated) 0

Final Disposition:

- discarded dead/comatose/unresponsive carcass (marked?) ____
- salvaged carcass/parts (list all): ____
- released alive
- taken to holding facility (location): ____
- unknown (explain): ____

Behavior upon release:

- swam away vigorously
- dove quickly
- swam away slowly
- dove slowly
- remained at surface
- sank
- surfaced to breathe
- other (describe): ____

Describe the nature of any injuries caused by capture and release (i.e. blood in water, location of bleeding, how much bleeding, cuts/lacerations on body and where): ____

Data Recorder ____ Tagger ____

Mitigation Measures in place at time of capture: ____

Additional Comments: ____

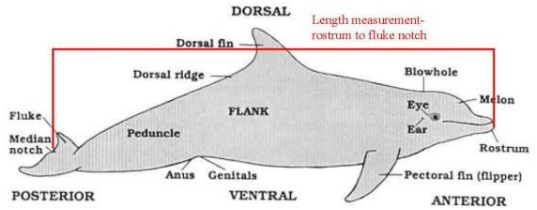
Please submit completed PSIT Form and photographs within 24 hours to nmfs.ser.ea_loa.takereport@noaa.gov. Please enter Fisheries Independent Monitoring Protected Species Take (BiOp SER-2009-7541) in the subject line and include the project name and species in the text of the email.

Print Form | Reset Form | Page 3 of 4

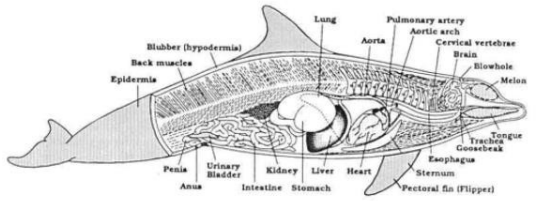
Sample PSIT Reporting Form, Page 4 of 4

Use these diagrams to annotate any details as specifically noted above and any anomalies, wounds, location of living tags, etc. Also, be sure to indicate locations of all biological samples collected. To annotate the diagrams, on your menu, go to *Tools->Comment and Mark up* and select a drawing tool. Use the typewriter tool to enter text.

Marine Mammals



Basic External Anatomy

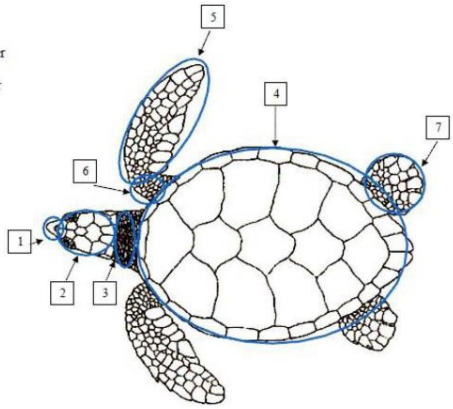


Basic Internal Anatomy

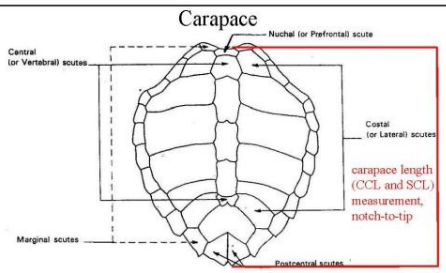
Sea Turtles

External hardshell:

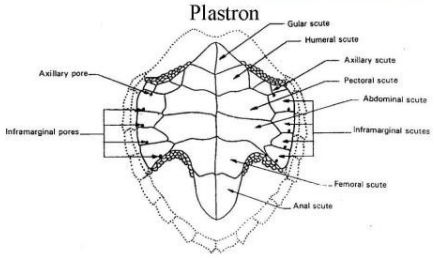
1) Beak
2) Head
3) Neck
4) Carapace
5) Front Flipper
6) Shoulder
7) Rear Flipper



Carapace

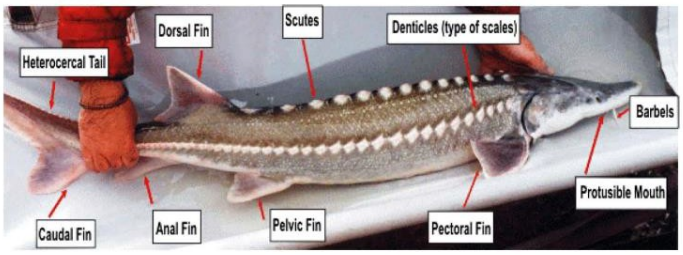


Plastron

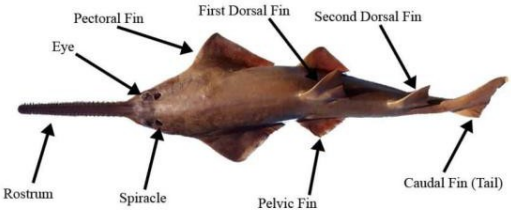


Finfish

Sturgeon



Sawfish



Page 4 of 4

FINAL
Programmatic Environmental Assessment

for

Fisheries and Ecosystem Research Conducted and Funded

by the

Southeast Fisheries Science Center

March 2020

Appendix D

Southeast Fisheries Science Center Protected Species Letters Confirming Mitigation and Monitoring Measures

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
75 Virginia Beach Drive
Miami, Florida 33149 U.S.A.
(305) 361-4204 Fax: (305) 361-4499

May 17, 2017

Mr. Jim Valade
Florida Manatee Recovery Coordinator
U.S. Fish and Wildlife Service
North Florida Ecological Services
7915 Baymeadows Way, Suite 200
Jacksonville, Florida 32256

Re: Manatee Habitat, NMFS Conditions for Netting in Manatee Habitat and request for concurrence on NMFS informal consultation with USFWS pursuant to Section (7(a) of the Endangered Species Act.

Dear Mr. Valade:

This letter addresses specific comments by the U.S. Fish and Wildlife Service (USFWS), and received by the National Marine Fisheries Service, Southeast Fisheries Science Center (NMFS), on May 18, 2016, on the Draft Programmatic Environmental Assessment (DPEA) for "Fisheries and Ecosystem Research Conducted and Funded by the NMFS, Southeast Fisheries Science Center." The comments by USFWS evaluated the potential direct, indirect, and cumulative impacts of conducting fisheries and ecosystem research in marine waters along the southeastern coast of the U.S., the Gulf of Mexico, and the Caribbean Sea (Puerto Rico and U.S. Virgin Islands) on species that the USFWS has statutory and trust responsibility to protect with emphasis on the Florida manatee (*Trichechus manatus*).

During their review of the DPEA, the USFWS identified an historical take of manatee during turtle excluder device (TED) research in 1997 and suggested that it be included in the DPEA. Upon further investigation by NMFS, it was determined that this mortality did not occur during a NMFS-funded research program. Rather, the take occurred during a TED research project conducted by the Gulf and South Atlantic Fisheries Foundation (GSAFF). The GSAFF is a private, nonprofit research organization supporting commercial fishing interests in the Southeast region. The project was not managed or directed by NMFS and the GSAFF was responsible for procuring any required State and Federal research permits. The incidental take occurred aboard a contracted shrimp trawler off the Northeast coast of Florida and NMFS learned of the incidental manatee take anecdotally during a phone call with the project coordinators. Therefore, this take has not been included in the DPEA because it is considered outside the scope of the NMFS fisheries research program.

Finally, NMFS and USFWS discussed conditions for netting in manatee habitat to be included in the DPEA as mitigation measures to ensure no takes of manatee occur in NMFS-funded and -directed research. The attached Standard Conditions for Netting in Manatee Habitat address NMFS fisheries research as mitigation measures. Specifically, Conditions 1, 2, 4, 5, and 6 apply, including requirements to adhere to manatee protection zone measures when traveling in inshore waters to and from offshore project sites, requirements for disentangling manatees, and reporting requirements for all accidental captures, etc. In addition, given the unlikelihood of Florida manatees being found at distances greater than one mile from shore, NMFS and the USFWS find that:

a. Condition 3a need not be applied to permits for netting activities located beyond one mile from shore in the southeastern U.S. given the low likelihood of encountering manatees at such distance. In addition, NMFS SEFSC utilizes plankton gear (such as bongo or neuston nets) within one mile from shore. However, given the extremely low

likelihood a manatee would become entangled in this gear and considering additional mitigation measures described below, Condition 3a need not be applied to such research.

b. Condition 3b requires a 15-minute waiting period at each sampling site. NMFS has conducted a coastal trawl survey that has been in operation for over three decades without incident. This coastal research involves a 20-minute tow at each site (excluding wire-out and haulback time), sorting of fish, and moving on to the next station. Manatees are extremely unlikely to rare in most of the area covered by this survey. In the 30+ years this trawl survey has been active, we have never interacted with or observed a manatee. Given the short duration of research tows and regular monitoring for manatees to avoid interactions, Condition 3b is not needed.

c. Condition 3c requires having at least one dedicated manatee observer. Approximately 90% of research cruises do regularly monitor for manatees as scientific or vessel crew are generally available to conduct observations; however, there is a small percentage of tows where crew are fully occupied conducting research or are needed to safely operate the vessel. Therefore, observations for manatees might be disrupted during those circumstances. Despite these circumstances, our ability to monitor for manatees to the extent practicable has resulted in zero manatees captured in NMFS fishery research activities. NMFS would continue to use this approach.

d. Condition 3d requires that netting and vessel movements stop if a manatee comes within 100 feet of the action area. For NMFS research activities to stop, we must retrieve the net which requires us to move the vessel. This means that a portion of the net would be left unattended to begin retrieval. Under these circumstances, if a manatee gets entangled in the net, we would be unable to assist the animal as we would be working to retrieve the net from a different position. Rather than stopping active netting, NMFS proposes to monitor the animal until it safely leaves the area, only retrieving the net if the manatee remains in the area and continues to approach the net thereby increasing the possibility of becoming entangled.

e. These exceptions do not apply to projects occurring in waters in Puerto Rico and in the U.S. Virgin Islands where the subspecies Antillean manatee (*Trichechus manatus manatus*) may be found at distances of greater than one mile from shore. Generally, NMFS research in these waters does not involve netting. Some bottom longlining does occur but the lines are attended 100% of the time and there has never been an interaction with a manatee. Permit applications for projects occurring in these areas should continue to be considered on a case by case basis.

NMFS SEFSC also conducts research on the endangered smalltooth sawfish (*Pristis pectinata*) under scientific research permit No 17787, issued February 12, 2014 (see attached). The sawfish research contains conditions identified in Section 5(j) of the permit and have been agreed upon by NMFS and USFWS to ensure that no taking of manatees will occur. In all cases, if a manatee is observed, the primary objective becomes to monitor the animal until it safely leaves the area.

This letter and agreed upon conditions will be appended to the DPEA, and the conditions herein be considered as required mitigation measures to protect the Florida manatee throughout its range during NMFS fisheries and ecosystem research in the marine waters of the southeastern United States. Further, agreement to these conditions concludes informal consultation between NMFS and the USFWS pursuant to Section (7(a) of the Endangered Species Act.

Thank you for assistance in this matter. If you have further questions please contact Dr. Melissa Cook at 228-549-1628 or at Melissa.Cook@noaa.gov or myself at 305-361-4264 or Bonnie.Ponwith@noaa.gov.

Sincerely,

Bonnie J. Ponwith, Ph.D.
Science and Research Director

United States Department of the Interior

U. S. FISH AND WILDLIFE SERVICE

7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FLORIDA 32256-7517

IN REPLY REFER TO:

May22, 2017

Bonnie J. Ponwith, Ph.D.
Science and Research Director

U.S Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
75 Virginia Beach Drive
Miami, Florida 33149 U.S.A.

Re: Manatee Habitat, NMFS Conditions for Netting in Manatee Habitat and request for concurrence on NMFS informal consultation with USFWS pursuant to Section (7(a) of the Endangered Species Act

Dear Dr. Ponwith:

The U.S. Fish and Wildlife Service (Service) evaluated the National Marine Fisheries Service's (NMFS) Draft Programmatic Environmental Assessment for Fisheries and Ecosystem Research Conducted and Funded by the NMFS, Southeast Fisheries Science Center. In our review we recommended as mitigation measures the Service's Standard Conditions for Netting in Manatee Habitat (Standard Conditions).

As discussed with your staff, the Service agrees that not all mitigation measures identified in the Standard Conditions are appropriate measures for the described work. Consistent with your letter dated May 17, 2017, we agree that Standard Conditions 3a and 3b are not applicable and that identified modifications to Standard Conditions 3c and 3d should provide necessary protections for manatees during fisheries and ecosystem research activities.

This concludes our consultation pursuant to section 7(a) of the Endangered Species Act. Please contact Jim Valade at Jim_Valade@fws.gov or by phone at 904 731-3116 if there are any questions or concerns. Thank you.

Sincerely,

for Annie Dziegmowicz

Jay B Herrington
Field Supervisor

Attachment: Letter, dated May 17, 2017

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
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Science and Research Director