

R/V KATY Volunteer Training Manual



UNIVERSITY OF TEXAS MARINE SCIENCE INSTITUTE



MISSION ★ ARANSAS NATIONAL ESTUARINE RESEARCH RESERVE

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INTRODUCTION

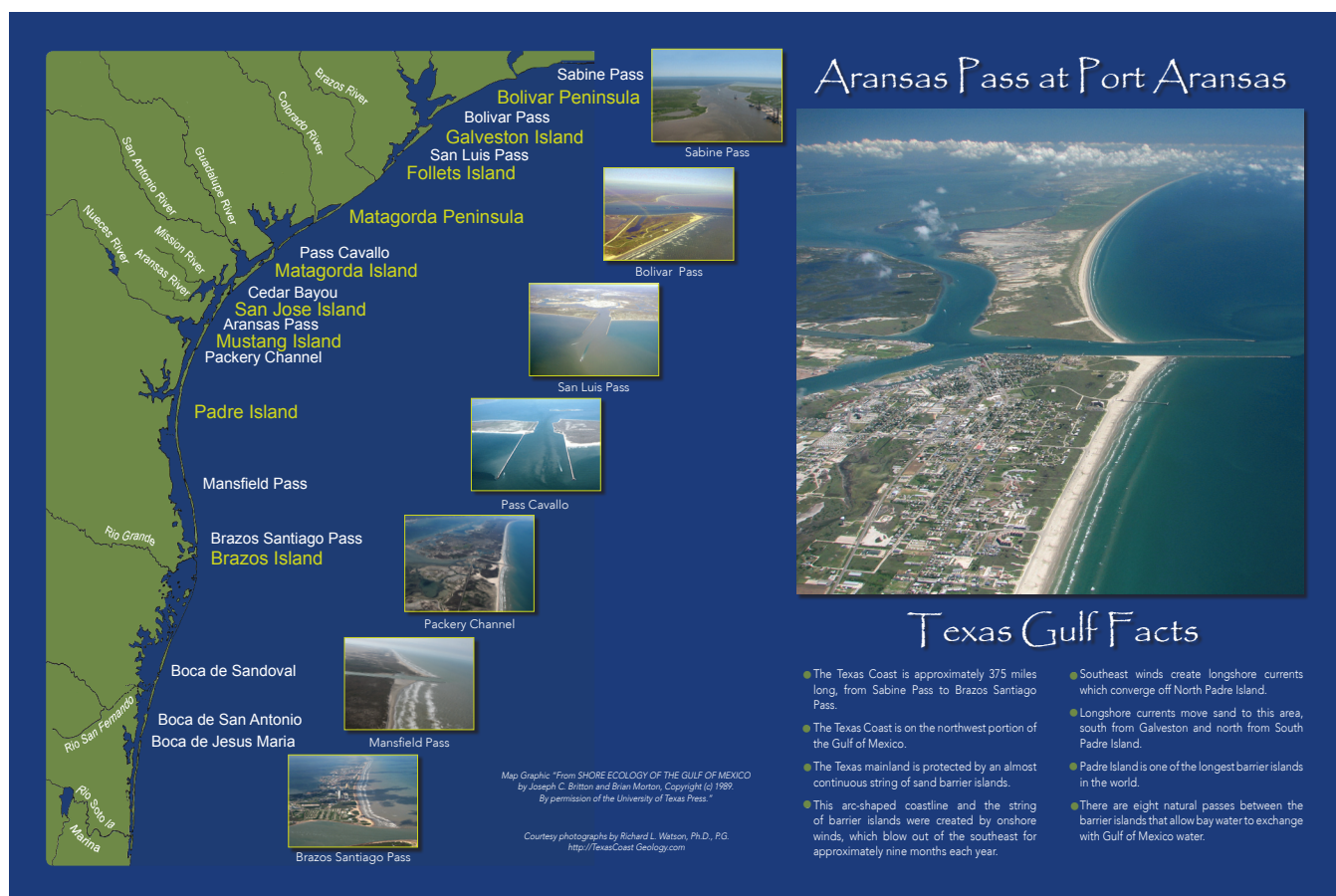
Background Information

The University of Texas Marine Science Institute is located at the north end of Mustang Island. Across the ship channel to the north is San Jose Island. These are two of a string of barrier islands that form a protective ribbon of sand that stretches from south of Brownsville to north of Galveston, a distance of some 270 miles of open beach. Between the mainland and the barrier islands lie shallow bays and lagoons that form a rich nursery ground teeming with marine life.

The soft bottoms of the bays are rich in nutrients, supporting a diverse community of molluscs, marine annelids, crustaceans, and benthic algae. The margins of the bays and lagoons are covered with dense seagrass meadows that provide both food and shelter for larval and juvenile forms of marine life.

The central Texas coast has two major bay systems. The Aransas Bay System, north of Port Aransas, covers an area of 157 square miles and includes Aransas, Copano, and Mission Bays. Aransas Bay is located behind San Jose Island. It's maximum depth is 5 to 6 feet deep in the north end of the bay increasing to 10 to 13 feet at the southern end near the Lydia Ann Channel.

One of the areas frequently visited on R/V KATY trips is located at the junction of the Lydia Ann Channel and Aransas Bay. It represents a hard substrate environment. Otter trawl samples are collected here in a long trough, averaging 24 to 28 feet deep, formed by the large volumes of water funneling from Aransas Bay through the narrow Lydia Ann Channel. This massive water movement occurs during hurricane storm surges and, more frequently,



This sign is located in the Wetlands Education Center and depicts the chain of barrier islands that make up the Texas Coast.

during passage of very windy cold fronts in the winter. The moving water scours the bottom and carries finer sediments up the channel, leaving the heavier shell and shell fragments behind. Some of the shell fragments found there are slowly being destroyed by the boring sponge, *Clione* sp.

The shells in the Lydia Ann Channel also provide attachment points for a host of other marine invertebrates, such as encrusting bryozoan, star coral, serpulid worms, barnacles, oyster spat, ribbed mussels, and hydroids. The shell rubble is also home for several species of mud crabs, amphipods, brittle stars, snapping shrimp, and tunicates, as well as a variety of gobies, blennies, and skillet fish.

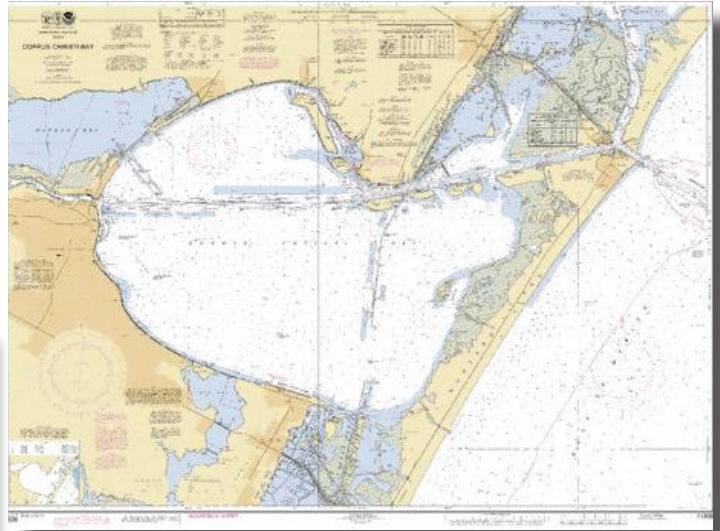


The Lydia Ann Lighthouse.

The Lydia Ann Channel extends to the south between San Jose Island and Harbor Island. The remainder of the channel averages 12 to 15 feet deep over a sandy-mud bottom. The Harbor Island area on the west side of the channel is the largest black mangrove marsh in Texas. The shallow sloughs and lakes within the marsh provide shelter and food for the area. The marsh also is home to many of the larger wading birds, such as the Reddish Egret, Great Blue Heron, Snowy Egret, Great Egret, and the Roseatte Spoonbill.

The Aransas Pass Lighthouse (or Lydia Ann

Lighthouse), built in 1855, also is located on Harbor Island. Its beacon guided sailors across San Jose Island through the many natural passes that once existed there. The present pass is a natural pass that has been jettied with granite boulders and deepened to 45 feet to allow ships to pass through the barrier island to the inshore ports.



USCG Chart of the Corpus Christi Bay System.

To the south of Port Aransas is the Corpus Christi Bay system, made up of Corpus Christi Bay, Nueces Bay, and Redfish Bay, an area of approximately 200 square miles. Corpus Christi Bay is the largest of the three with an area of 152 square miles. It has an average natural depth of 12 to 15 feet, grading up to a depth of 3 to 5 feet along the margins of the bay. The sediment is dark, clay-like mud with scattered oyster reefs located in the shallows along the shore.

Nueces Bay, one of the two true riverine-influenced estuaries along the central Texas coast, is located on the northwest edge of Corpus Christi Bay. Nueces Bay is a small, shallow bay covering an area of 29 square miles. Runoff from the Nueces River and its upstream drainage basin plays an important role in nutrient cycling and regeneration throughout the Corpus Christi Bay system. Dams placed upstream, however, will reduce the flow of the river and affect both the salinity gradient of the bay and the nutrient

flushing and cycling that occurs after periodic floods.

Redfish Bay is on the northeast side of Corpus Christi Bay. This small, shallow bay has an average depth of only 3 to 8 feet and covers an area of 19 square miles. The sediment varies from coarse shell along the margin of the ship channel to soupy, claylike mud in the upper parts of the bay. Redfish Bay's margins are heavily vegetated with several species of seagrasses as well as dense growths of macroalgae. Stands of submerged vegetation form dense meadows that provide both food and shelter for a host of larval and juvenile marine life.

South of Corpus Christi Bay is a long, narrow body of water called the Laguna Madre. It extends some 115 miles behind Padre Island south to Port Isabel. There is very little water movement in Laguna Madre, and evaporation far exceeds the rainfall. This creates hypersaline conditions during dry years. It is not uncommon to encounter salinities in the 40 to 60 ppt range and in excess of 100 ppt in isolated ponds.

The Corpus Christi Bay and Aransas Bay systems are connected by a ship channel which runs from the west end of Corpus Christi Bay to the junction of the Lydia Ann Channel. This channel is connected to the Gulf of Mexico by a natural pass through the barrier islands. The channel is maintained at an authorized depth of 45 feet. It has been dredged through a hard clay substrate and is shaped like an open "U".

All the sampling that takes place on the R/V KATY trips occurs behind the barrier islands. As the name implies, barrier islands provide an effective barrier against storm surges during hurricanes, and can help prevent oil from entering the productive bay systems.

Barrier islands are cut by natural passes that allow Gulf waters to exchange and mix with bay and lagoon waters. Collectively these channels provide a highway to move goods and materials by ships and barges. They also serve as a highway for nutrients and

marine life to move between the bay nursery grounds and the shallow, productive continental shelf off the Texas coast. During virtually every month of the year, some form of adult marine life - fish, shrimp or crab - is migrating from the shallow bays and lagoons through channels and barrier islands into the shallow Gulf shelf to spawn either offshore or in the mouth of the channel. The native Gulf white shrimp, *Penaeus setiferus*, is a typical example.

After hatching from an egg, shrimp begin life offshore as larvae. Being poor swimmers, they are carried by tides and currents through passes into shallow bays and lagoons. As postlarvae, they take up residence in the rich nursery grounds. Shrimp are omnivorous bottom feeders, and their food consists of algae, molluscs, marine worms, and small crustaceans. *P. setiferus* reach adult size after nearly a year in the sheltered bays, and begin their annual spring migration back to the open Gulf, using channels and passes through the barrier islands. Adult shrimp feed on organic materials that they find in the surface layer of the offshore sediments. This organic material, called detritus, is made up of rotting vegetation swept out of bays by tides. It also includes remains of other marine plants and animals that have a role in the marine food chain.

This is a typical estuarine life cycle. It is exhibited by the majority of important commercial and sport species of fish, crabs, and shrimp found off the Texas coast.

PROCEDURES

Safety



1. All persons 12 years of age or younger must wear a U.S.C.G. approved life jacket at all times.
2. Know where life jackets are located on board.
3. Board/disembark only when told to do so by staff.
4. Wear closed-toed shoes with good traction (tennis shoes, etc.). NO SANDALS.
5. Do not go below deck or on upper deck without permission.
6. No running or horseplay.
7. Keep body extremities inside the boat while underway.
8. Beware of moving equipment, hoses and cables or ropes under tension, such as trawl wires.
9. Do not sit on, climb on, or attempt to operate any equipment or rigging.
10. Wash hands thoroughly after handling any chemicals on board. Do not put chemicals into mouth, nose or eyes.
11. Do not handle specimens until shown how to do so properly. Some animals can sting, bite, pinch, cut, or stab very effectively.
12. Follow all instructions of UTMSI personnel.
13. Persons with known severe allergies should inform MSI personnel in advance and not handle certain animals and chemicals.



Trip Outline

Trip agenda may vary on the basis of trip length and student group.

Pre-cruise

1. Meet at the UTMSI Boat Basin 30 minutes prior to when the R/V KATY is scheduled to leave.
2. The naturalist will introduce the program activities and cover safety procedures with the group on the pavilion.
3. Ensure that all those going on the boat have signed the ship's log.
4. Equip students with life jackets, if necessary. Board the vessel and stow gear.

Cruise

1. Plankton Tow - one tow at the surface
2. Water Quality Reading - with YSI sonde when boat is stopped (Optional)
3. Peterson Mud Grab - sediment type, composition and benthic infauna identification
4. Otter trawl in Redfish Bay - fish samples, crabs, shrimp, vegetation
5. Otter Trawl in Ship Channel - fish samples, crabs, shrimp, vegetation

Return Trip

1. Clean up and store collected gear.



R/V KATY Trip Check List

Equipment Checklist

- o Hat, Sun Glasses, Sun block, and Water
- o Empty Datasheet, clipboard, and pencil or pen
- o YSI Sonde (optional)
- o Laminated "talking posters" of plankton
- o Plankton net with cod end
- o Working Microscope & other magnifiers with lenses, slides and working batteries

Pre-trip Checklist:

- o Hand out life jackets to students, if students are under age 12 or if requested.
- o All adults going on the R/V KATY, including you, have signed the sign-in sheet.



Plankton Tow

- o Be willing to work the winch while naturalist lowers the net
- o Be available to help students use the different types of magnifiers
- o While some students are in the wet lab, keep others engaged in the different types of magnifiers. Show students how to refresh samples in specimen holders, if required.
- o Help to ensure that all students have a rotation in the wet lab.
- o Leave plankton sample and bin of magnifiers on the deck - some students return for further examination



Trip Procedure Checklist

Getting underway and on the trip out

- o Help students store things in the dry cabin and guide them to the bow of the boat
- o Make sure the magnifiers are ready for use
- o Put a new data sheet on clipboard
- o If not done, turn on TV, microscope(s), and cameras
- o If not done, put saltwater in live well
- o Engage students in observing other animals (birds, dolphin etc.)
- o Monitor safe behavior of students



Petterson Mud Grab.

Mud Grab

- o Move Peterson Mud Grab to back deck with the naturalist.
- o Make sure there is a short bucket under the grab
- o Bring out the three sieves and set them on the deck
- o Bring out glass dishes and forceps
- o Be available to help students pick through samples and find specimens.
- o Rinse grab after sample is distributed into sieves
- o Rinse deck of mud while students are in wet lab
- o Move grab back to original location

Otter Trawl

- o Help keep students safe by monitoring the orange – NO STAND – areas
- o Be available in the wet lab – some students like to continue looking through plankton samples.
- o Stand near the naturalist with data sheet to record fish species and number



- o Have dip net ready to hand to the Naturalist
- o Assist Naturalist as directed
- o Work with students to encourage careful observation and respectful handling of fish
- o On the second trip of the day, if appropriate, remind the Naturalist that there might be other specimens in the holding tanks

Return Trip

- o Help students and or the naturalist return unwanted specimens to the water
- o Spray fresh saltwater into holding tanks to aerate water, especially on the second trip of the day
- o Clean-up wet lab and make ready for the next trip or store lab equipment and tools
- o Engage students in observing other animals or interesting scenery



Gulls and other birds will flock to the boat if fish from the trawl are thrown overboard. Often times students and staff will get pooped on. Discourage feeding the birds for this reason.

At the Boat Basin

- o Monitor student safety, by ensuring that body parts are not outside the rails and gunwales of the boat and that all life jackets remain zipped or buckled.
- o Manage the life jackets, after the students are off the boat, put them in storage or place them for access to the next group.
- o If necessary, wipe jackets clean with damp towel.



Shut Down

- o Turn off microscope(s), cameras and TV, cover TV
- o Rinse petri dishes and other containers with freshwater. Position to drain and air dry.
- o On the way home collect all magnifiers, rinse everything with freshwater, and replace in bins. Bleach from under the sink can be added to water if soaking lenses is needed.
- o Wipe off counter in wet lab
- o Empty Holding tanks of critters and drain – try not to feed the local Pelican.

To find out if the Visitor Center aquarium staff would like what was caught call Lynn Ulch at 361-749-6805.

Save any Ribbon fish or squid caught for the ARK at 361-749-6793 and make sure someone is there to use them.

Emergency Procedures

In any emergency the first thing to do is notify the naturalist and the captain and wait for instructions.

In case of:

Fire - There are fire extinguishers located in the wheel house and dry cabin of the boat. There is a fire suppression system for fires below deck and should only be used under the authorization of the captain.

Man Overboard - Immediately notify the captain. Do not take your eyes off of the person/s in the water. Throw anything that floats, preferably a life ring with tether.

First Aid - There is a large first aid kit located in the dry cabin on the wall over the stairs. Any time someone is injured on the R/V KATY including yourself it needs to be recorded in an incident report. These are forms located in the first aid cabinet.



R/V KATY Volunteer Job Description

Objective

To convey the mission and interpretive goals of the Marine Education Services department at the University of Texas Marine Science Institute by helping to educate school and public groups about the importance and biodiversity of different ecological habitats within marine systems that flow into the Gulf of Mexico.

Characteristics and Experiences

Deckhands must be enthusiastic, cheerful and willing to learn. They should have an interest in working with students and other groups of all ages. It is essential that Deckhands are physically capable of working on a boat for up to four hours at a time. Experience in natural history, environmental or marine science and/or education are helpful but not required.

Supervision & Training

Deckhands will complete an introductory training with volunteer supervisor, compliance training, and read and familiarize themselves with the Volunteer Training Manual. Deckhands will shadow the naturalist and assist on R/V KATY trips as in the field training.

Requirements

- Minimum age of 15 years
- Communicate via e-mail
- Receive and follow directions from volunteer supervisor
- Work up to a four hour shift
- Walk and talk comfortably on a moving boat
- Withstand extreme weather conditions,

heat, rain, cold etc.

Activities and Responsibilities

Deckhands are responsible for helping to engage students in a better understanding of the biological, physical and chemical processes at work in the marine environment and the interrelationships among them. The Deckhands are also responsible for assisting with supply set up, take down, and cleaning.



RESOURCES

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Appendix

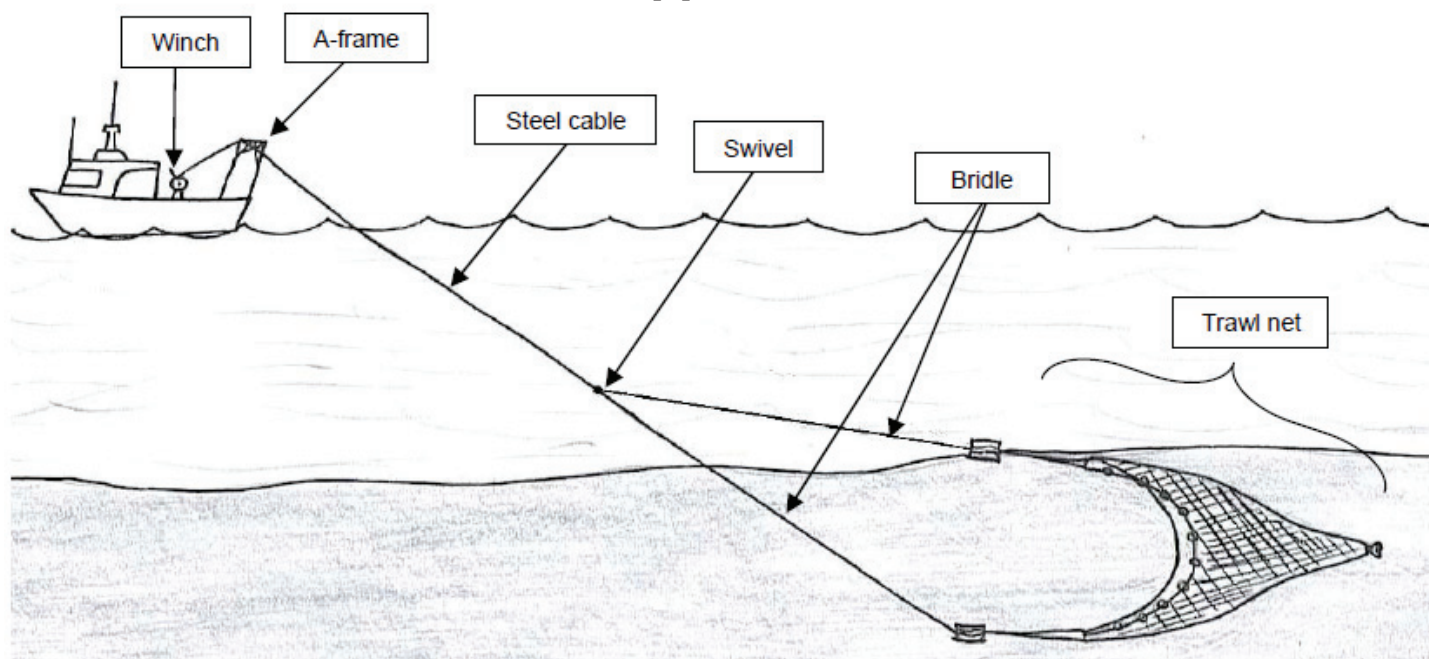


Illustration courtesy of Bonnie Batson

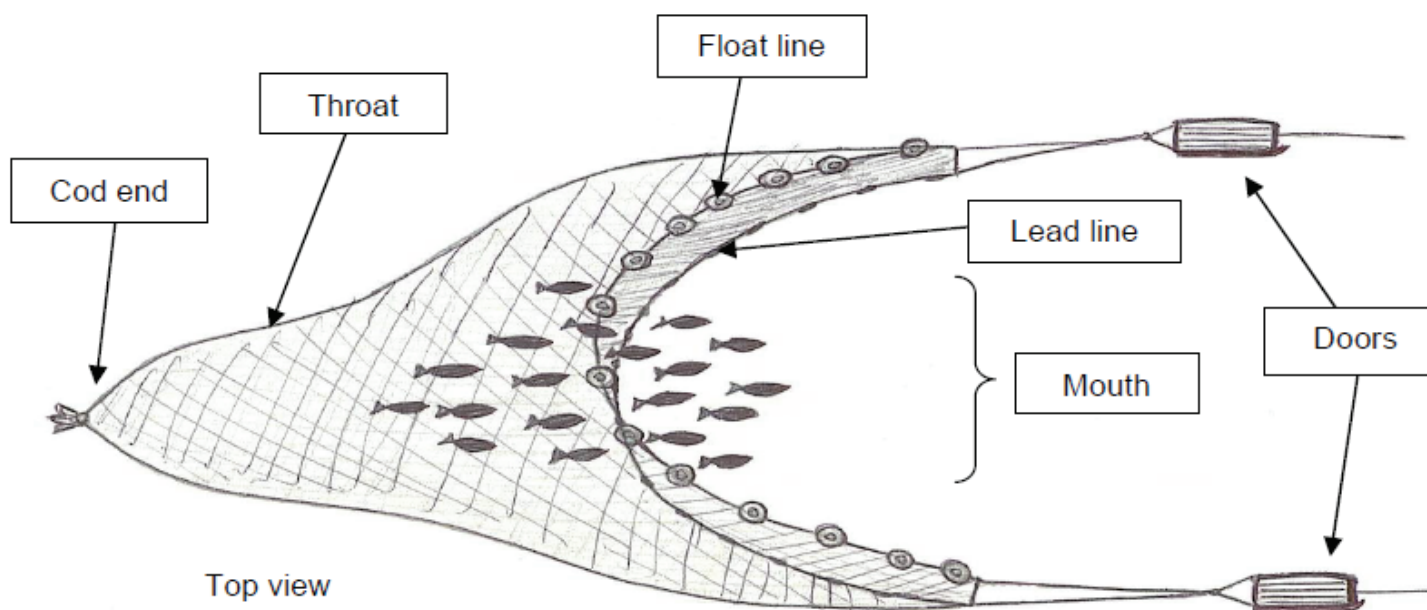


Illustration
Courtesy of Bonnie Batson



References

Tinnin, Richard K. 1992 Marine Education A seagoing Education Experience. Texas A&M University Sea Grant College Program.