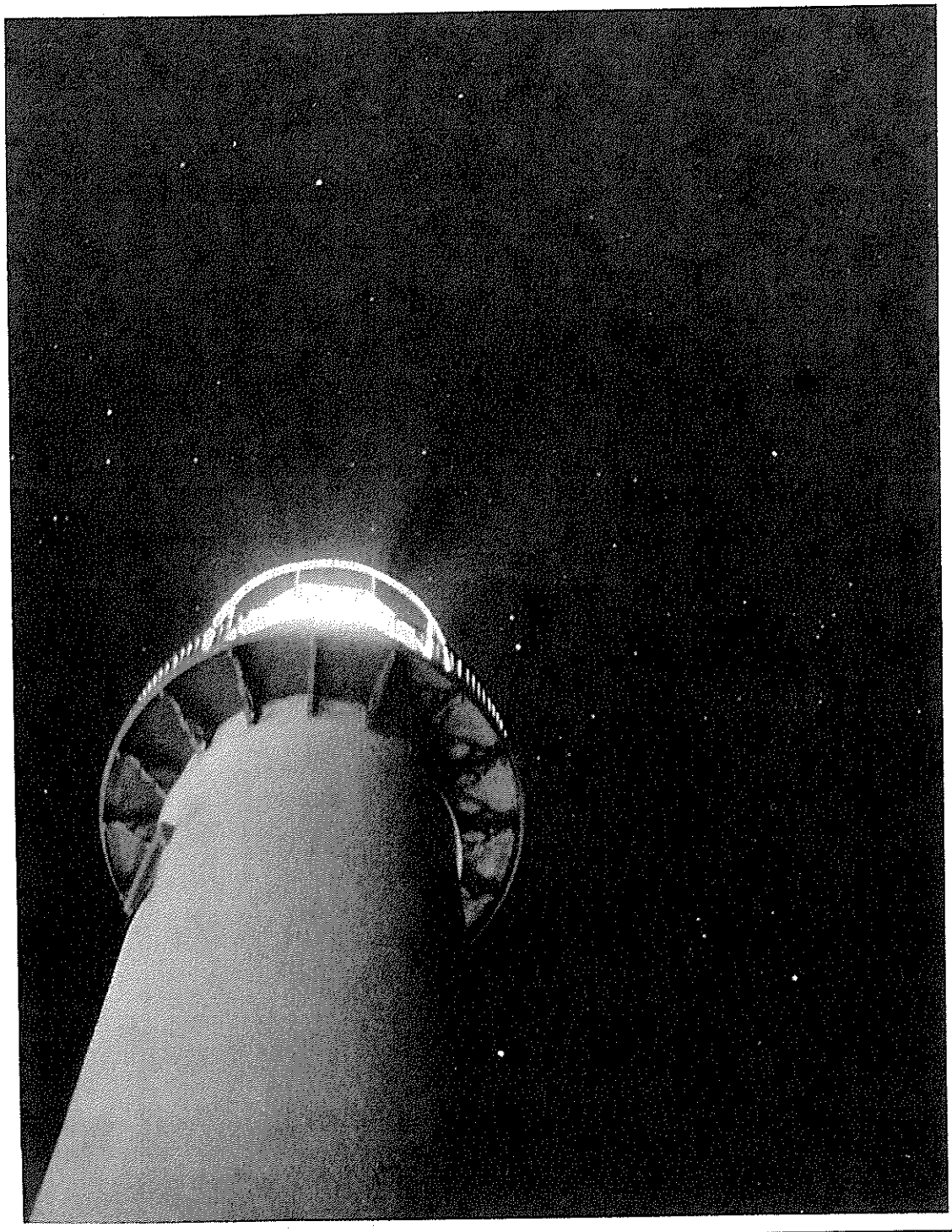
March-April, 1980

Volume 3, No. 2

Coastlines

GEORGIA



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Dr. Robert J. Reimold, Director

Steve Olsson, Editor

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Blessing Of The Fleet
May 16-18, 1980
Darien, Georgia
Come, Enjoy, Learn

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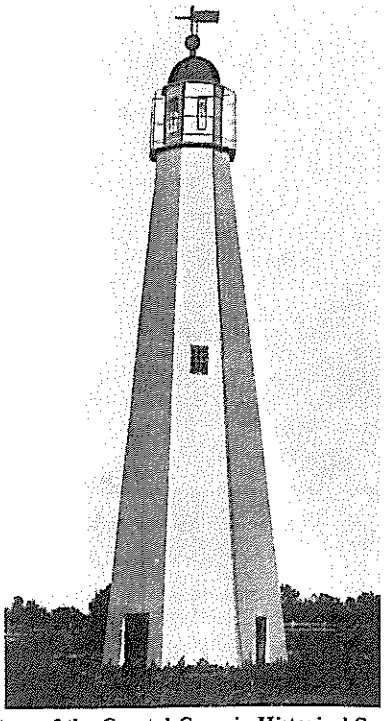
About The Cover

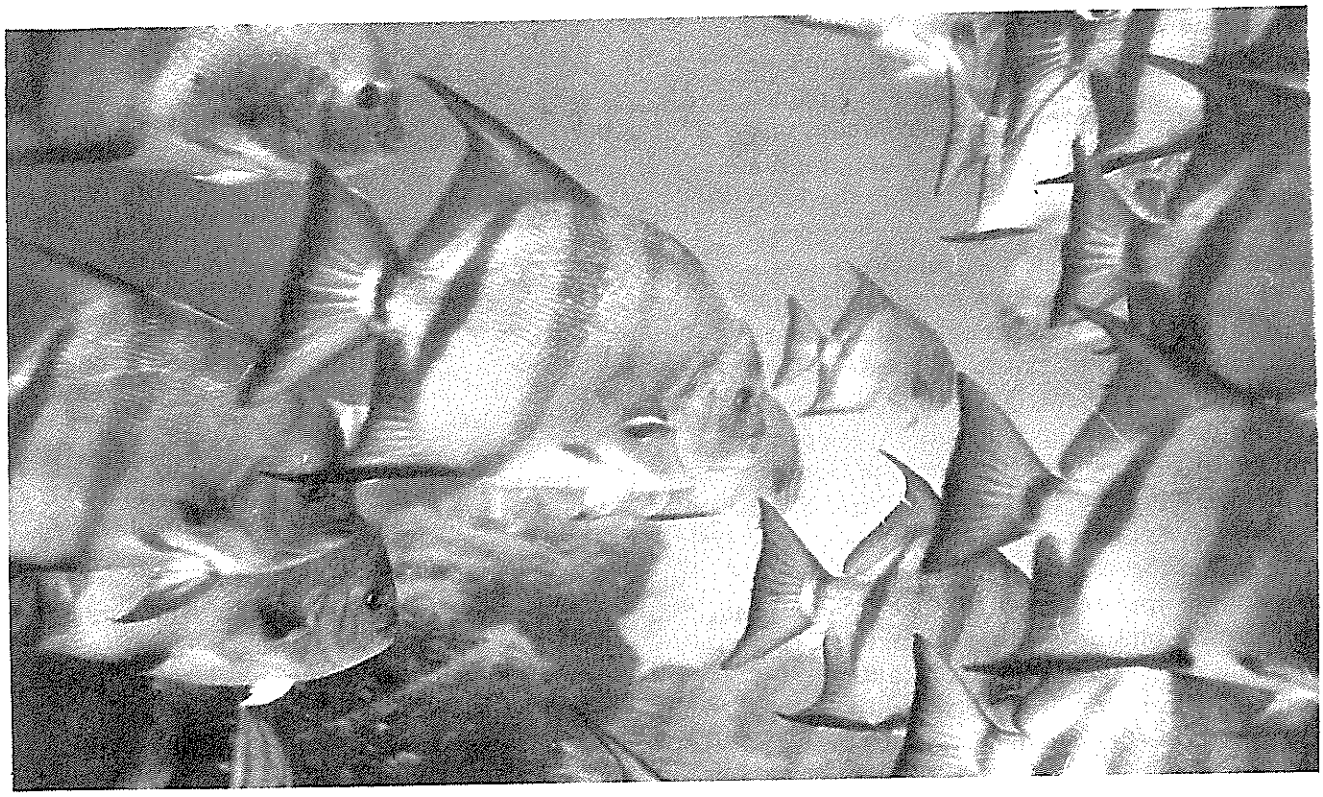
The clarity of a cold winter night forms an effective backdrop for the beacon of the St. Simons Island lighthouse. Construction of this structure, which stands at the south end of the island, was begun in the war years of 1867 and finished in 1872. The design was the work of Charles Clusky, a prominent architect of that period, who also furnished the plans for the Governor's mansion in Milledgeville.

In contrast, the photo below shows the first lighthouse built on St. Simons. The work of James Gould, this structure was completed in 1810. When President Lincoln ordered the blockade of the Confederate harbors in 1862, the local Confederate troops blew up the lighthouse to prevent Union forces from capturing it and using it as a navigational aid.



(Courtesy of the Coastal Georgia Historical Society.)

Cover Photo by Steve Olsson



Georgia's Artificial Reefs

In 1970, marine biologists assigned to the Coastal Fisheries Section, a branch of the Georgia Department of Natural Resources, realized that marine recreational fishing off Georgia's coast could be vastly improved by constructing artificial reefs. These reefs would hopefully being closer to shore and concentrate some of the species found in abundance forty miles offshore.

Preliminary studies of a naturally occurring "live bottom" area sixteen miles offshore of Sapelo Island indicated these fishes would live closer to shore provided food and habitat were available. Therefore, in 1972, Coastal Fisheries personnel, along with the assistance of personnel from the National Marine Fisheries Service's Artificial Reef staff, launched a construction and research program to establish areas reasonably close to shore where offshore anglers could experience good fishing.

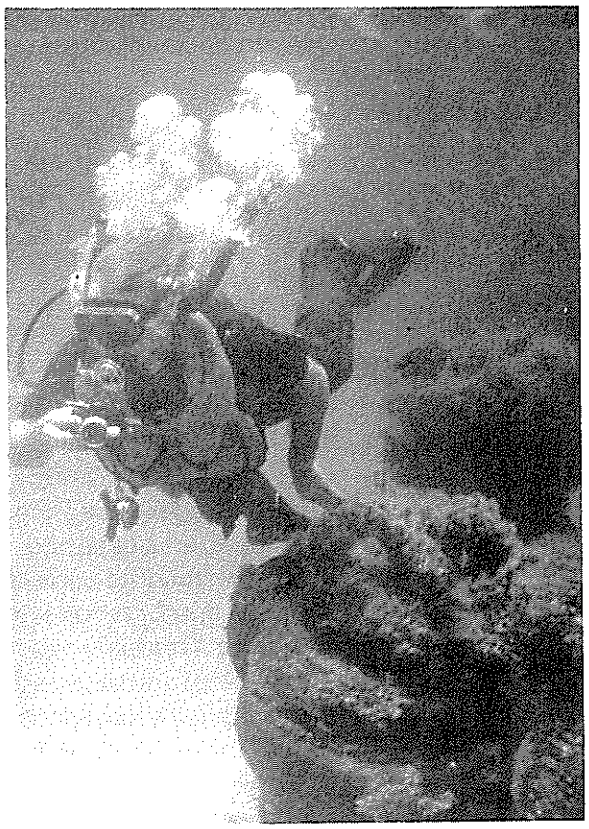
The reef project has resulted in the construction and location of aids to navigation for nine reefs located 7 to 23 nautical miles offshore. Altogether, they are composed of over 162,000 scrap automobile tires and nine surplus vessels ranging from 33-424 feet in length. Each of the artificial reefs and the Sapelo Live Bottom is marked with a 3rd class nun buoy which is maintained by reef project personnel.

Research studies completed by project personnel have dealt with the feasibility of materials for reef construction and fishery resources assessments using SCUBA. Studies recently completed include a tagging program to determine the migratory patterns of various reef associated fishes, a standing stock assessment study using mark/recovery techniques and SCUBA, a creel census/angler use study to determine fishing pressure and success of various reefs, and an economic evaluation of the benefits of the reefs. All of the studies are leading to a better understanding of what types of reefs to build, where they should be located, and how best to manage the fish stocks associated with them.

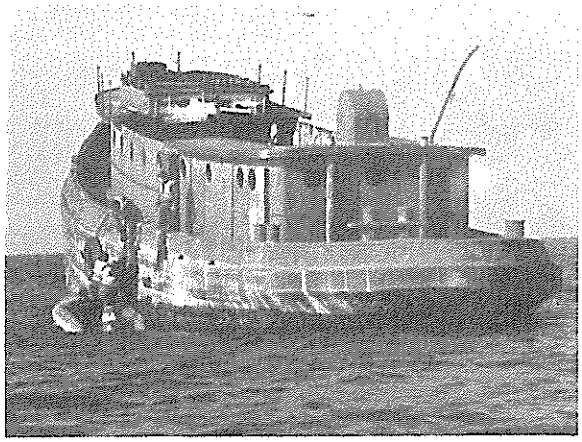
Major recreational fishing on the reefs

occurs from late spring through early fall when the pelagic fishes are abundant. These include such species as king mackerel, Spanish mackerel, barracuda, amberjack, bonito and cobia. Occasionally, sailfish and dolphin are also taken on the reefs. Trolling is the most common method of fishing for these species. As winter approaches, the pelagics migrate south to avoid the colder water temperatures and anglers usually direct their attention to bottom fishing for black sea bass, red snapper, grouper, sheepshead, triggerfish and others.

Another user group which is experiencing rapid growth in popularity in coastal Georgia and is utilizing the reefs a good deal is the SCUBA divers. For the most part, diving is restricted to the warmer summer months when the water temperature is comfortable. Some of the hardier souls do venture out in the spring and fall however. A word of caution . . . conflicts have developed between divers and rod and reel fishermen in the past. Courtesy is the rule. Do not start diving where people are fishing and do not start fishing where people are diving.



Georgia's artificial reefs provide stimulating scenery for SCUBA diving and underwater photography.



CRD biologists make final inspection on the M/V ELMIRA, now part of Artificial Reef J.

Several sportfishing clubs have been active in building reefs in the past. Unfortunately, their reefs have over the years eroded away or are simply no longer marked. The Golden Isles Sportfishing Club of St. Simons Island has constructed a reef near Buoy R2B. We applaud their efforts and encourage other organizations to follow this direction.

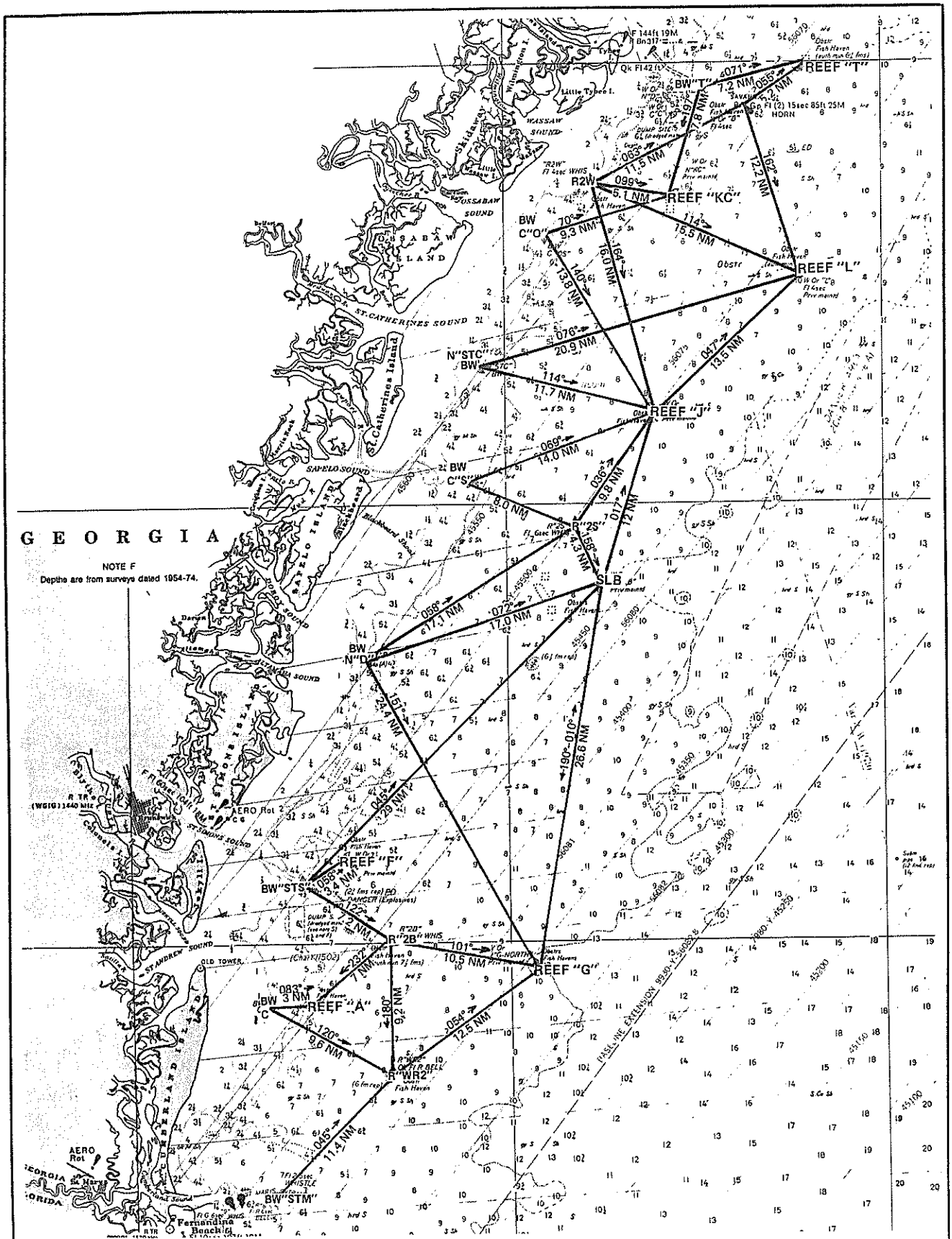
DESCRIPTION OF REEFS

The following is a list of Georgia's artificial reefs and the Sapelo Live Bottom. We describe the geographic location of each reef in relation to narby aids to navigation (buoys) as well as the materials from which each reef was constructed. The buoys are U.S. Coast Guard permitted buoys; consequently it is a federal violation to tamper with or tie to the buoys.

Reef "A" -- Located 7.0 nautical miles east of Little Cumberland Island. 1700 tire units have been placed at Georgia's newest reef. The units are scattered about in all directions from the buoy, with major clumps located north of the buoy at about 150 yards.

Reef "F" -- Located 8.2 nautical miles offshore of Jekyll Island. This reef is composed of 6000 tire units located in all directions from the buoy. Large concentrations are located about 75 yards northwest and north of the buoy.

Reef "G" -- Georgia's largest artificial reef, reef "G", is located approximately 23 nautical miles offshore of Little Cumberland Island. It is composed of the 424-foot liberty ship **E. S. Neddleton**, a 33-foot Striker, a 100-foot tugboat and 3000 tire units. The tugboat is located approximately 200 feet at 180° from



This chart is intended to give relative locations of the reef system and should not be used as a sole means of navigation. All distances are in nautical miles (NM).

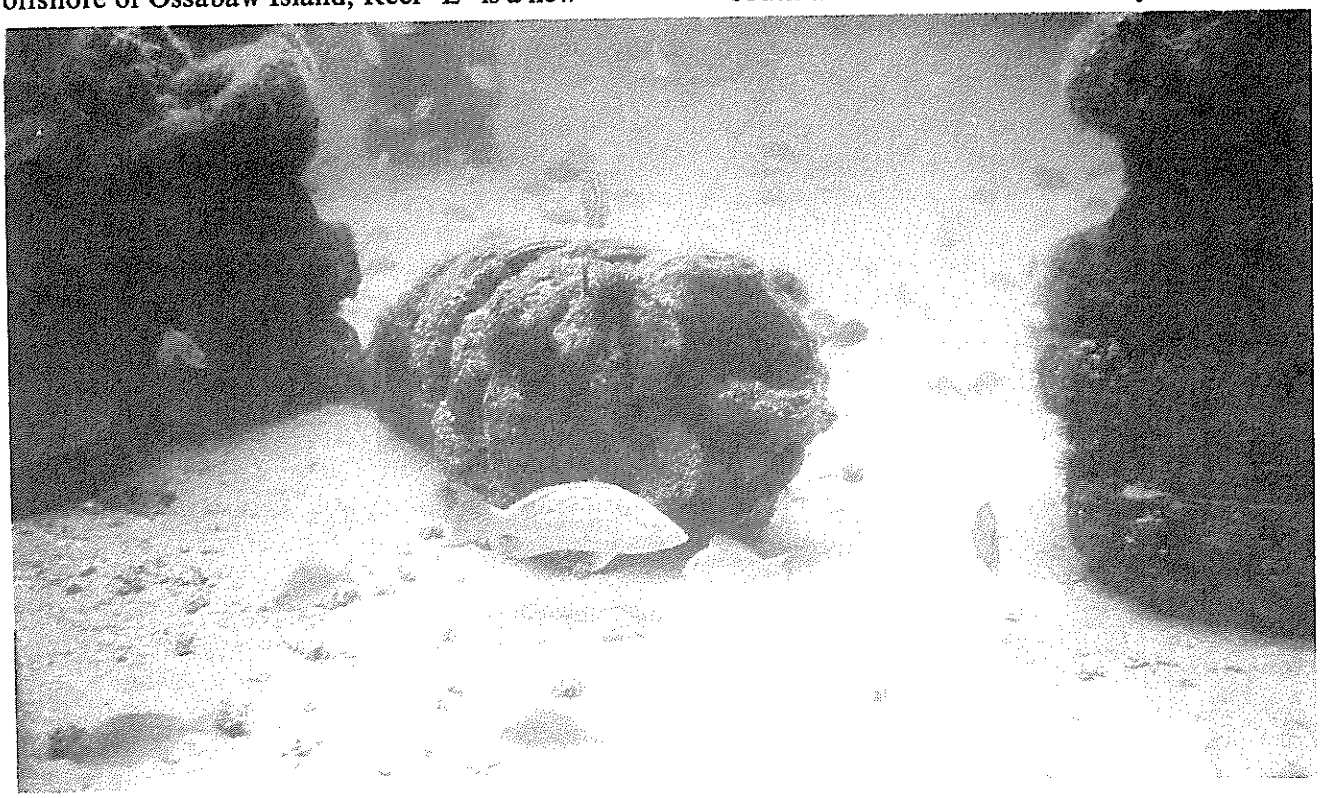
the buoy. The Striker is located 50-100 feet at 100° from the buoy. The axis of the **Neddleton** runs east-west. Large concentrations of tire units are located 100-200 yards north and northeast and 50-100 yards southwest of the buoy, and 50-100 yards south of the tugboat.

Reef "J" -- Located 17.4 nautical miles offshore of St. Catherine's Island, this reef was started in May 1974 with the sinking of a 65-foot wooden vessel. The vessel is located approximately 200 feet at 270° from the buoy marking the reef. The 424- foot liberty ship, **A. B. Daniels**, was sunk approximately one year later in July 1975. The **Daniels** presently lies about 400 yards at 300° from the buoy. Located near the wooden vessel is the 105 foot tugboat the **M/V Elmira**. Sunk in February 1980, the **Elmira** is the latest addition to Reef "J". One thousand tire units are also located at Reef "J". Scattered patches of live bottom lie east and south of the buoy.

Reef "KC" -- Located 9.0 nautical miles offshore of Wassaw Island. The reef is composed of 5700 tire units located in all directions from the buoy.

Reef "L" -- Located 23 nautical miles offshore of Ossabaw Island, Reef "L" is a new reef started in March 1977. It is composed of two steel barges, 2000 tire units and the 150-foot dredge, **Henry Bacon**, added in August 1978. A lighted buoy marks the dredge, however the DNR has frequent problems with this buoy due to periodic vandalism and tampering. The first barge is located about 150 yards at 30° from the buoy which is directly over the **Henry Bacon**. The second barge is located about 200 yards at 290° from this buoy. Tire units are scattered between these vessels.

SLB - Sapelo Live Bottom (Gray's Reef) -- Sapelo Live Bottom is located 16 nautical miles offshore of Sapelo Island and is one of the largest naturally occurring live bottom areas in the South Atlantic. The term "live bottom" indicates a limerock outcropping which provides a substrate for soft and hard corals, sponges and other forms of marine life to attach. Also known as Gray's Reef, for the late University of Georgia Marine Institute scientist, Milton Gray, this area has been nominated for status as a National Marine Sanctuary. The largest concentrations of live bottom, though scattered, run for several miles south and southwest of the buoy.



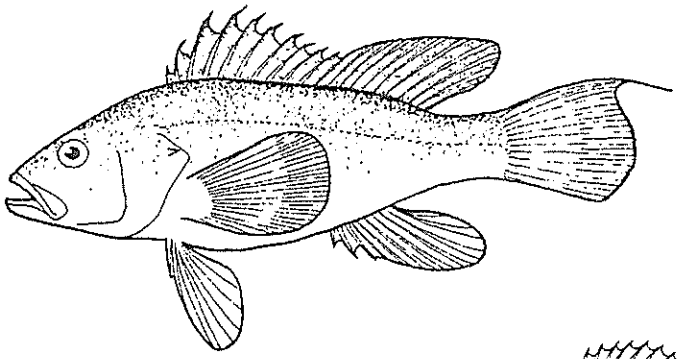
Within a few week of their placement on the ocean floor, tire units become encrusted with barnacles, brysoans and urchins. The scamp grouper in the foreground is one of the many gamefish species inhabiting the reefs.

Reef "T" -- Located 11.7 nautical miles east of Tybee Island. This reef is a joint effort between the States of Georgia and South Carolina. South Carolina's buoy marks the reef site at this time. The main reef buoy is distinguished by external radar reflector. They also use a station buoy. One thousand tire units have been placed around the station buoy. There is also ample live bottom in the area.

WR2 -- Located approximately 16 nautical miles offshore of Cumberland Island. This is a U.S. Coast Guard buoy which marks the site of a refrigerator ship sunk during WWII. The ship was the subject of several salvage attempts and thus no longer resembles a ship, but consists only of jagged pieces of metal which have become encrusted with marine growth. The Coast Guard maintains the buoy system; therefore, they are subject to being replaced in slightly different locations, thereby necessitating a new survey to relocate material. As of this publication, fishermen report a large concentration of the wreck about 100 yards southeast of the buoy. Scattered tire units are located about 300 yards southwest of this buoy.

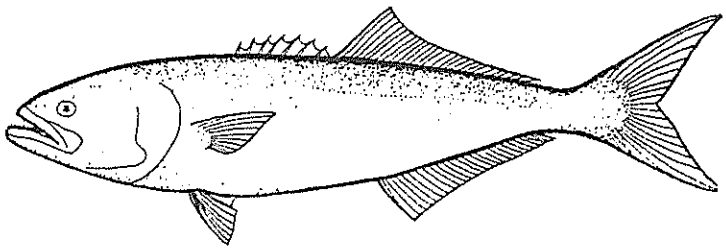
--Duane Harris, Henry Ansley, Steve Olsson
Photos by Duane Harris

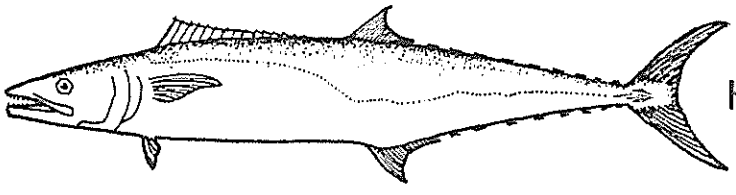
FISHES OF GEORGIA'S ARTIFICIAL REEFS



BLACK SEA BASS

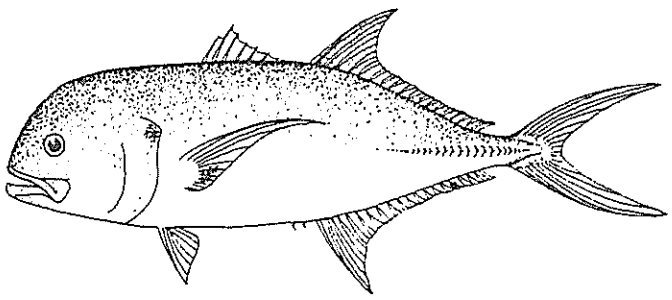
BLUEFISH

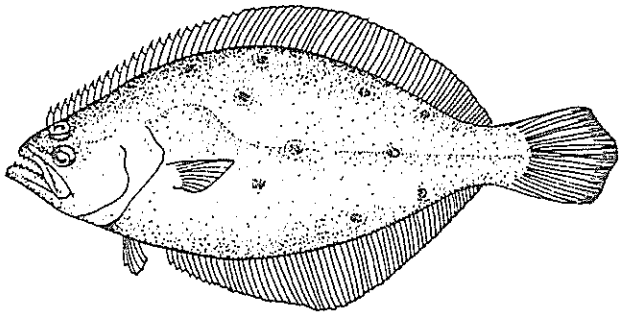




KING MACKEREL

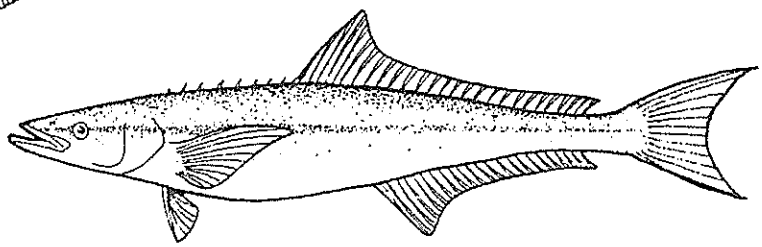
CREVALLE JACK

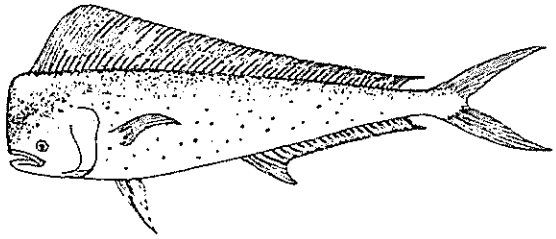




SUMMER FLOUNDER

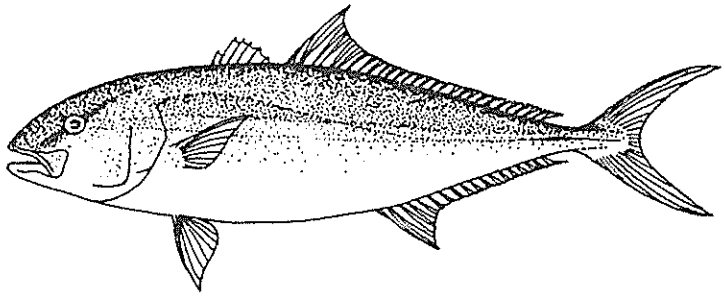
COBIA

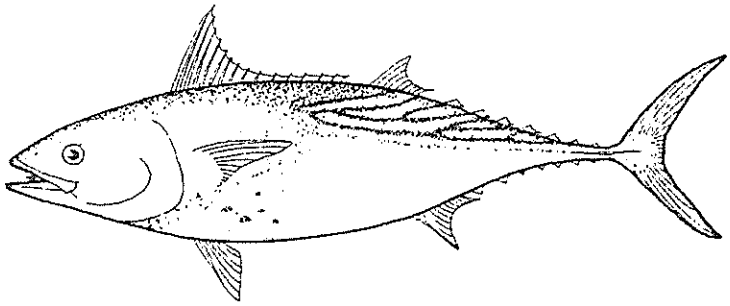




DOLPHIN

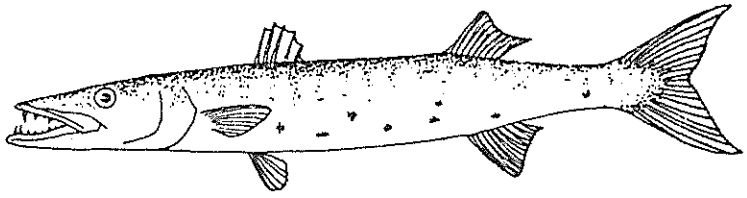
GREATER AMBERJACK



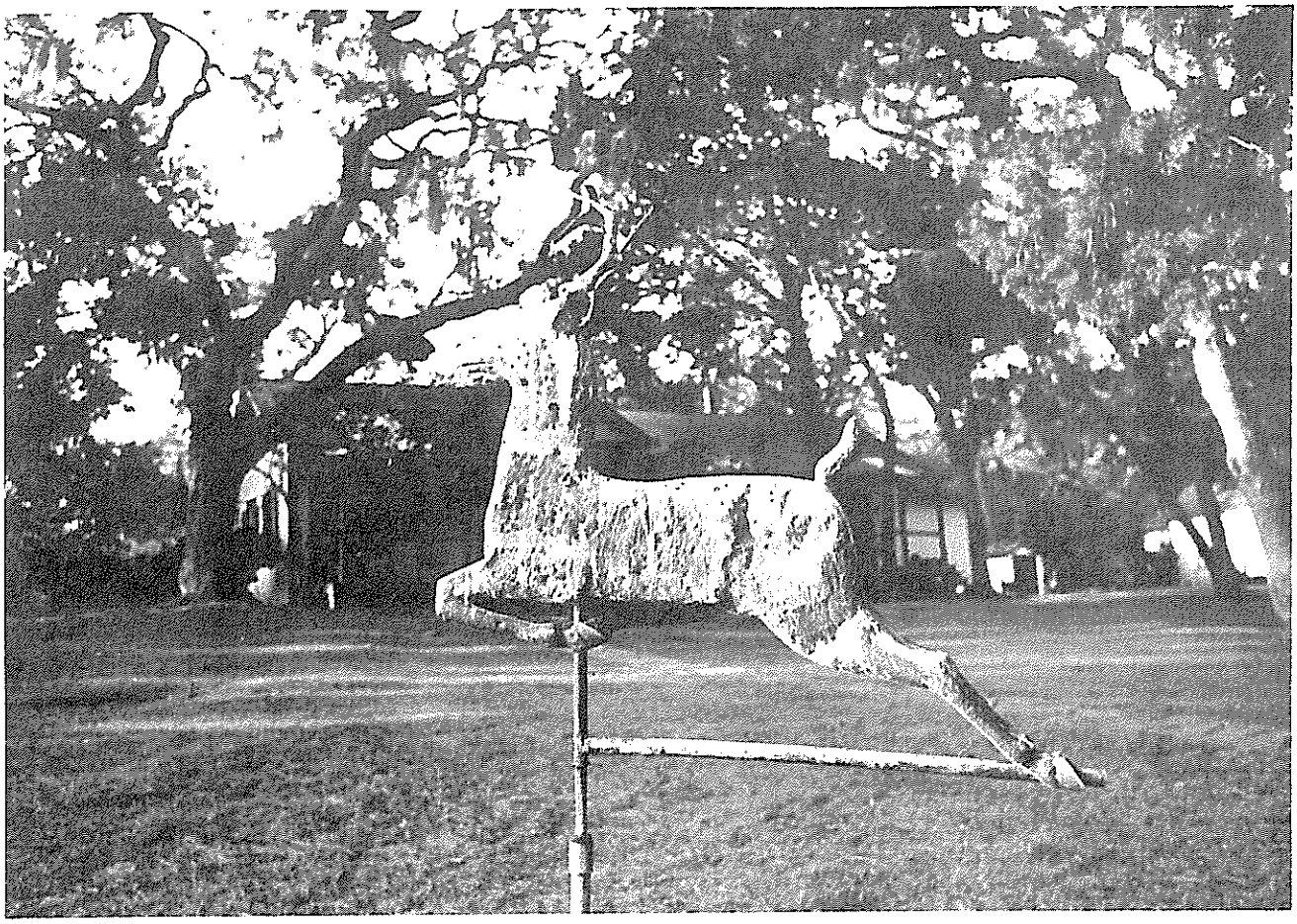


LITTLE TUNNY

BARRACUDA



These fish, along with 38 other species of coastal sportfish, are eligible for recognition as Georgia Saltwater Gamefish Records. For further information contact Steve Olsson, 1200 Glynn Avenue, Brunswick, Georgia 31523.



Little St. Simons Island

Have you ever driven along the coast and, looking to the east, hoped to get a glimpse of that great expanse of ocean, only to see still another distant tree line blocking your view? Then, realizing that the distant trees on the horizon are a barrier island, you begin to wonder what that island is like and what is there.

One of those distant tree lines is Little St. Simons Island. Located just north of Sea Island, it has been left mostly in its natural state, even though rice was grown in plantation days and the red cedars once cut.

Most of Georgia's barrier islands were given to their first owners as King's Grants and were worked as rice or cotton plantations. Little St. Simons Island was one of those early plantations. However, before its Irish descendent owners worked it, Indians inhabiting the coast hundreds of years earlier benefited from its endless natural resources. Shell mounds on the north end mark the presence of those early people. Pottery shards have also been found in the shell remains but have not been dated. The Indians must have enjoyed a bountiful supply of oysters and probably other shell and scaled fish as evidenced by the extensiveness of the shell deposits.

Most likely there were other European visitors to Little St. Simons before the island was granted to Major Pierce Butler in the mid-1700's, but no records have been found to substantiate that supposition. The Butler family owned the island until the early 1900's and grew rice on the north end where fresh water from the Altamaha River could be channeled into the fields.

The plantation was worked by descendents of Major Butler, and in the mid-1800's his grandson, Pierce Butler Mease, headed the business. At the request of his grandfather, Pierce dropped his paternal last name and was known as Pierce Butler from that time forth.

Later he married Fanny Kemble, an English actress who was not suited to plantation life. She was opposed and outraged at the plight of the slaves and wrote several books on the situation that were published in England. These were popular in England and are considered the reason sentiment changed there towards the South. After the war, the plantation failed economically. Frances Butler Leigh, the younger daughter of Pierce and Fanny, futilely tried to reestablish the business using Chinese and other foreign labor.

Mrs. Leigh sold Little St. Simons in the early 1900's to Mr. O. F. Chichester who represented a pencil slat company owned by the Berolzheimer family. The red cedars were once cut to be made into pencil slats, but the trees were too bent from the prevailing winds and salt spray to be used for pencils. The island then became the private vacation spot for the family. They have left it in its natural state for the most part and have built only a few small houses in one area.

Little St. Simons encompasses a variety of habitats and wildlife. It has a permanent bird population that includes the rare red-cockaded woodpecker, inumerable shore and wading birds, and literally hundreds of brown pelicans. During migration times, the fresh water ponds are full of waterfowl and on occasion even snow geese. In early spring and fall, warblers dominate the woods. Shorebirds heavily populate the north beach and Pelican Spit, off the south end, in late spring and late summer on into fall.

Its nearly 10,000 acres of high ground are broken into hammocks of varying sizes. Productive marshes comprise the rest of the area included by the island. These hammocks, marshes, and the fresh water ponds support the incredible wildlife population that is at times overwhelmingly abundant.

The hammocks are forested mostly by pine and palmetto, live oak, red bay, magnolia, holly and cabbage palms The grandiose live oaks are often furred with resurrection fern and an epiphytic orchid call the green fly orchid.

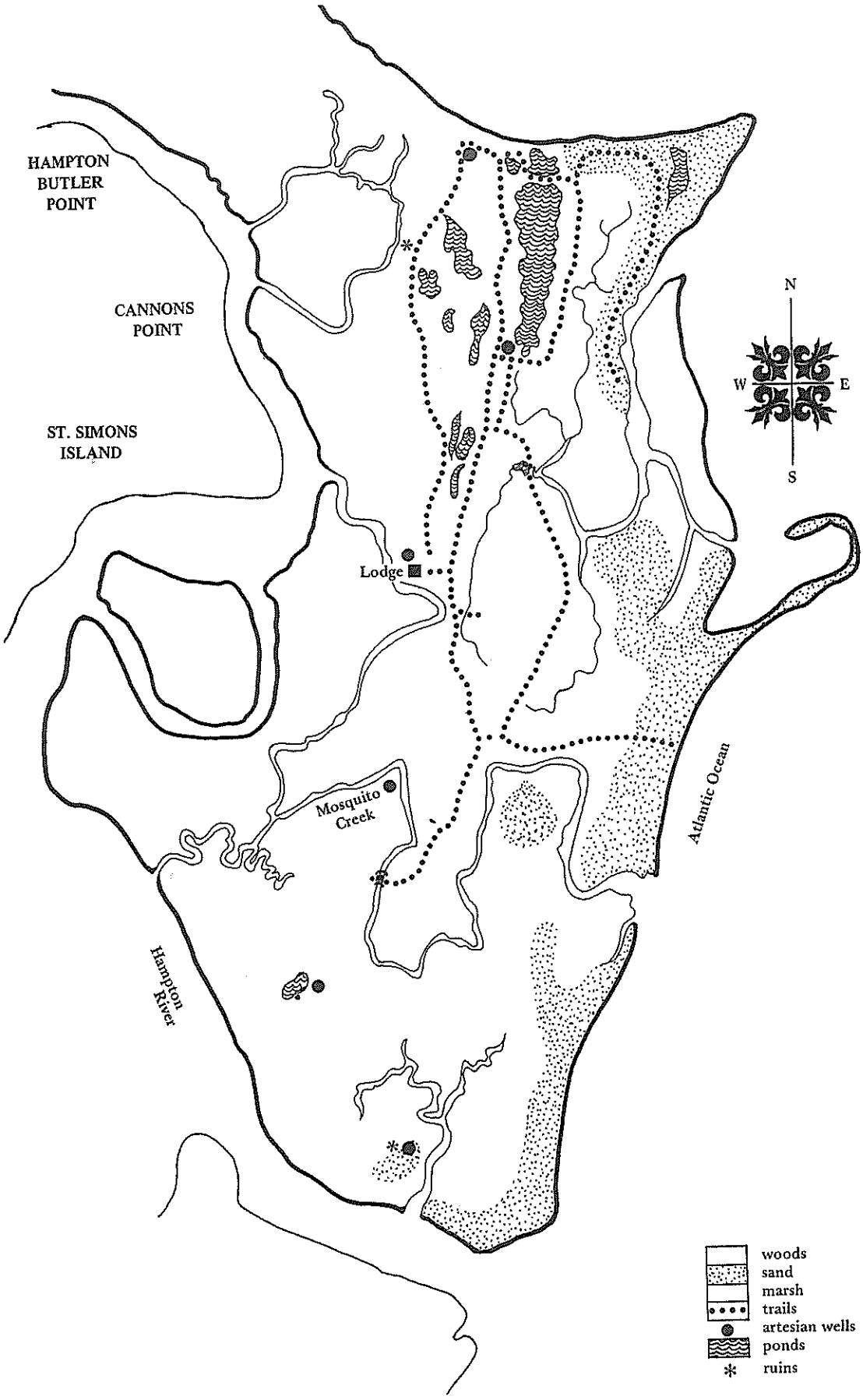
Foraging for edible plants is a relatively easy task any time of the year. A few succulent marsh plants are always available as well as red bay for seasoning. In the spring, the mulberry trees are ladened with their delicious berries, and during the summer, the French mulberry gives a bright lavender color to the surrounding greenery. In the fall, the pear-shaped fruit of the prickly pear cactus ripens for eating (after removing the prickles) or for making into a scarlet red jelly. During the wetter periods, mushrooms abound in the trees, on fallen logs, or on the forest floor. Some are delightfully edible, while others are at best palatably questionable though aesthetically pleasing.

Visitors to Little St. Simons readily become aware of the endless parade of the off-white, brown and spotted fallow deer that populate the island. Alligators inhabit the fresh and brackish ponds providing numerous "gator holes" that supply food and water for other animals during drought. Mink are present, but rarely seen. Raccoons and opossum are abundant and often seen. Tracks and burrows of armadillo have recently been found. During summer months, loggerhead sea turtles perform the ancient ritual of continuing their species. The island's eight miles of wide sandy beaches remain unlighted and undeveloped, beckoning the dwindling numbers of loggerheads to nest.

The marshes that make up the better portion of the island are broad expanses of green that provide a nursery for all kinds of salt water life. Crabs, snails and various watefowl all make their home here. Rails build their nests in the high marsh where sea ox-eye is likely to be growing and where only spring high tides are likely to reach. The melodious call of the marsh wren can be heard trilling from the green grass, too.

All of the parts that comprise Little St. Simons Island make it a haven for the wildlife that are permanent inhabitants and for those birds that stop for rest and refueling during migration times. People that have experienced the island agree that it is the best birding spot on the Georgia coast and none are disappointed with the rest of the wildlife. The seven wild horses that gallop with manes and tails flowing, exemplify the free feeling one gets when viewing the myriad of visual delights this island has to offer. So the next time you drive coastal Highway 17 and see those distant tree lines, you will know at least a little of the story that happens there daily.

--Kathy Fakas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artesian wells
ponds
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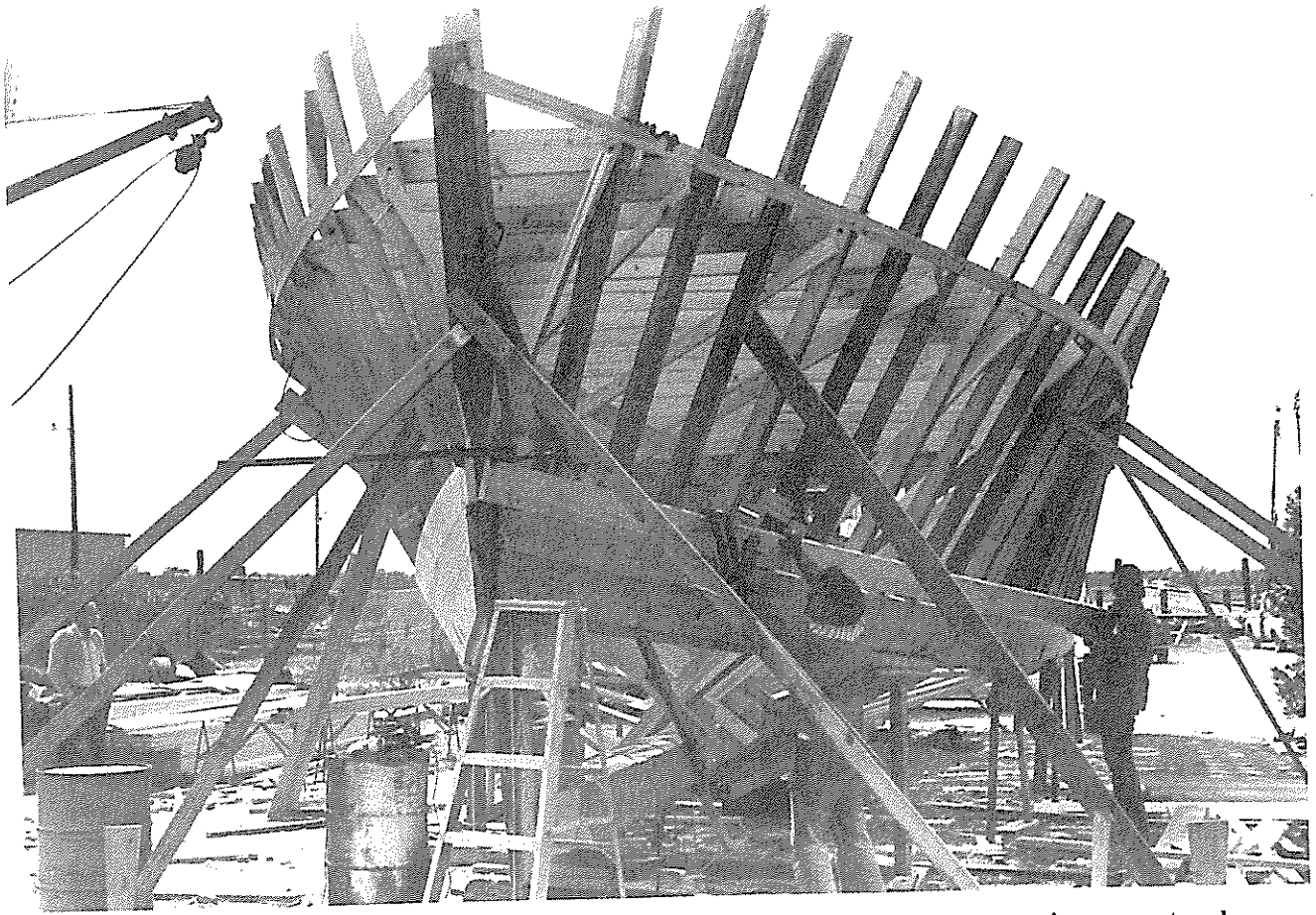
Georgia Shrimping -- The Ups And Downs

The headlines of 1979 would, in most instances, seem to point to a very successful year for shrimp fishermen. "Georgia Shrimp Season Finest On Record . . . Local Fishermen 'Rake In' Shrimp . . . Shrimpers Recoup Losses in '79" . . . and so on. True, shrimp fishermen fared considerably better this past year than in previous years. And yet, one must look beyond those headlines to discover the traumas, efforts, vigor, spirit and factors of fate and Mother Nature which are the real story of shrimping and the coastal Georgia fisherman.

During the 1979 commercial shrimp season over 5,800,000 pounds of shrimp (heads-off) valued at over $24,700,000 were reported landed in Georgia. Numerous fishermen shrimped the Georgia coast last year as evidenced by the 1,300 Commercial Fishing Licenses sold during 1979. Of these, over 250 were sold to out-of-state residents.

During the white roe shrimp season, in May and June, large roe shrimp (16/20 count) skyrocketed to over $6.00 per pound from the boat. However, diesel fuel also soared from 52 cents to 87 cents per gallon during 1979. Also consider that Georgia's shrimping season only lasts from April through January, and is not a year-round profit making business.

Considering that the average shrimp boat is approximately 68 feet in length and uses 16 to 18 gallons of fuel in an hour, these $6.00 per pound roe shrimp do not represent all profit. If a shrimp fisherman fished ten hours per day and burned 17 gallons of fuel per hour at 66

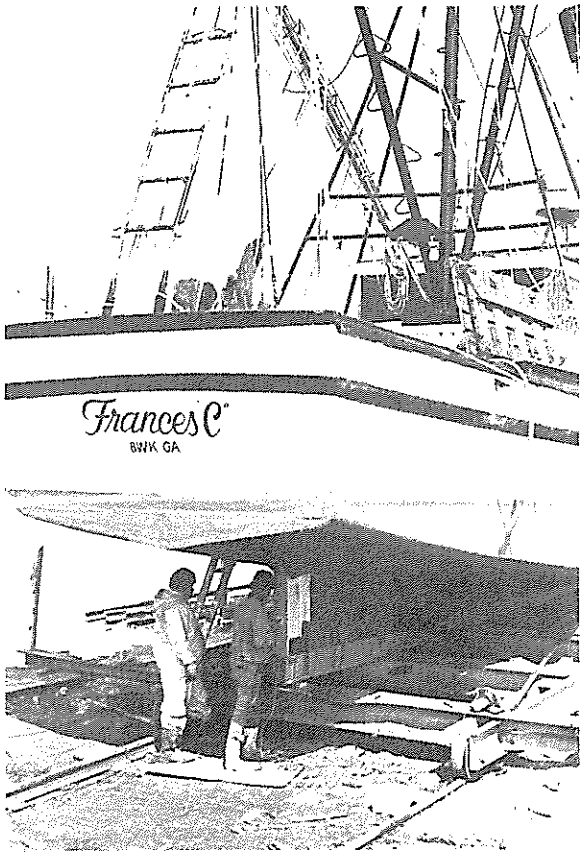


Starting at the bottom, Larry and H. M. Credle begin the awesome task of constructing a new trawler.

cents per gallon, (the price during roe season), his fuel cost alone would be $112.20. If he landed 1 box (100 pounds) of shrimp at $6.00 per pound he would gross $487.80 after his fuel payment. Not bad for a day's work. However, out of this comes the crew's share, usually 1/3 of the total catch. In addition to these expenses the skipper has the cost of necessities such as ice, oil, groceries, and miscellaneous gear.

Murphy's Law ("if anything can go wrong it will") seems to apply in shrimp fishing. It seems that right when the shrimp are there to be caught, something happens like a door "gets hung up" (caught on bottom terrain). This means a new set of doors costing approximately $600 to $700 for a 68 foot boat. In addition, there will probably be 5 to 7 days of waiting for the new doors. It is a bad feeling to be tied up all day at the dock while all your fellow shrimpers are out fishing for the six-dollar-a-pound roe shrimp. Finally, the new doors arrive, they're installed and the fisherman is ready to get back on the water. This days catch brings 150 pounds of shrimp and things are looking good. However, misfortune strikes again. The marine forecast is high winds and rough seas for tomorrow. It will be another day to be tied up at the dock.

The seas are six to eight feet and a northeaster is blowing like crazy. Everybody is around the dock waiting on calmer seas in hopes that the wind will blow some more shrimp out of the sounds. You think the shrimper that tore up a set of doors had some tough luck, well listen to this. There's talk around the dock about a shrimper who lost a wheel (propeller) on his boat. Now this means about five to seven days on the railway at approximately $25.00 a day if the railway is available and an initial "hauling out" charge of around $102.00 ($1.50 a foot). And the new wheel runs about $2,800. Of course, he's going back on the railway when shrimp season is over to have the bottom of his boat painted, patched, and re-caulked. Or maybe he'll need to have his engine overhauled for a "slight" fee of $12,000. 5,869,994 pounds of shrimp valued at $24,773,443.75 sounded like a lot of money in the beginning, didn't it? If your're interested in getting into the business, a new 68-foot shrimp boat, including electronic equipment, should cost you $250,000.



Winter allows time for many boats to be drydocked or on the rail while needed repairs are made. Willie Brown (L) and Lloyd Crum (R) are dropping the shaft log to install a larger wheel.

There is money to be made in shrimp fishing believe it or not, but one can readily see that the shrimp fisherman earns every penny of it. It takes a rare individual to be in this profession; long hard days, adverse weather conditions, good luck and good management. While most of us are sound asleep at 3:00 a.m., you'll probably find a shrimp fisherman starting up his boat, beginning his day, steaming to reach his favorite fishing ground by daylight.

--H. Jolaine Hall

Coastlines Georgia . . .

is delivered to you free of charge. If you or someone you know would like to receive this publication, please write: Steve Olsson, editor, Coastlines Georgia, 1200 Glynn Avenue, Brunswick, Georgia 31523.

Ebenezer Creek:

A Backwater Experience

Ebenezer is that perfect stream for anyone who wants to canoe regardless of seasonal low water. Although the water level in Ebenezer Creek may fluctuate in a range of up to eight feet or more, seldom will the water be too low to provide a remarkable canoeing experience.

Ebenezer Creek lies in a broad flattened basin contained on the south by a high bluff, which over time has eroded from the south and west banks of the Savannah River. Tidal backwaters and normal winter flooding on the Savannah River create a sort of 'water-dam' and directly influence (and maintain) the water levels in the Creek. This 'damming effect' has created a series of elongated lakes on the lower portion of the Ebenezer. The water levels fluctuate a great deal, remaining high for extended periods, but rarely will the flow be greatly accelerated, even during winter floods. The backwater condition is just right for float-fishing, photography, study, and just plain escape.

Bald cypress and Tupelo gum, the predominant trees along the creek, exhibit noticeable and unusually enlarged buttressed bases. The tupelo has a curious counter-clockwise twisting of its buttresses. These occurrences, coupled with an over-all dwarfed nature of growth, produce a most striking swamp forest unique to this backwater type system. These growth characteristics are probably attributed to year round flooding, low oxygen levels, and hydrostatic pressure.

In 1976, recognizing the lower Ebenezer Creek's unique characteristics, the National Park Service designated that portion below the Seaboard Coastline Railroad as a Nationally Significant Natural Landmark. Dr. John Bozeman and Lovell Greathouse of Georgia Department of Natural Resources, and Dr. Charles Wharton of Georgia State University, among many others, were instrumental in helping to gain this status for the Ebenezer.

A bill to amend the Georgia Scenic Rivers Act of 1969 proposed to designate the portion of Ebenezer Creek located in Effingham County as part of the Georgia Scenic River System. However, at the close of this legislative session, the bill still remained in the House Natural Resources Committee.

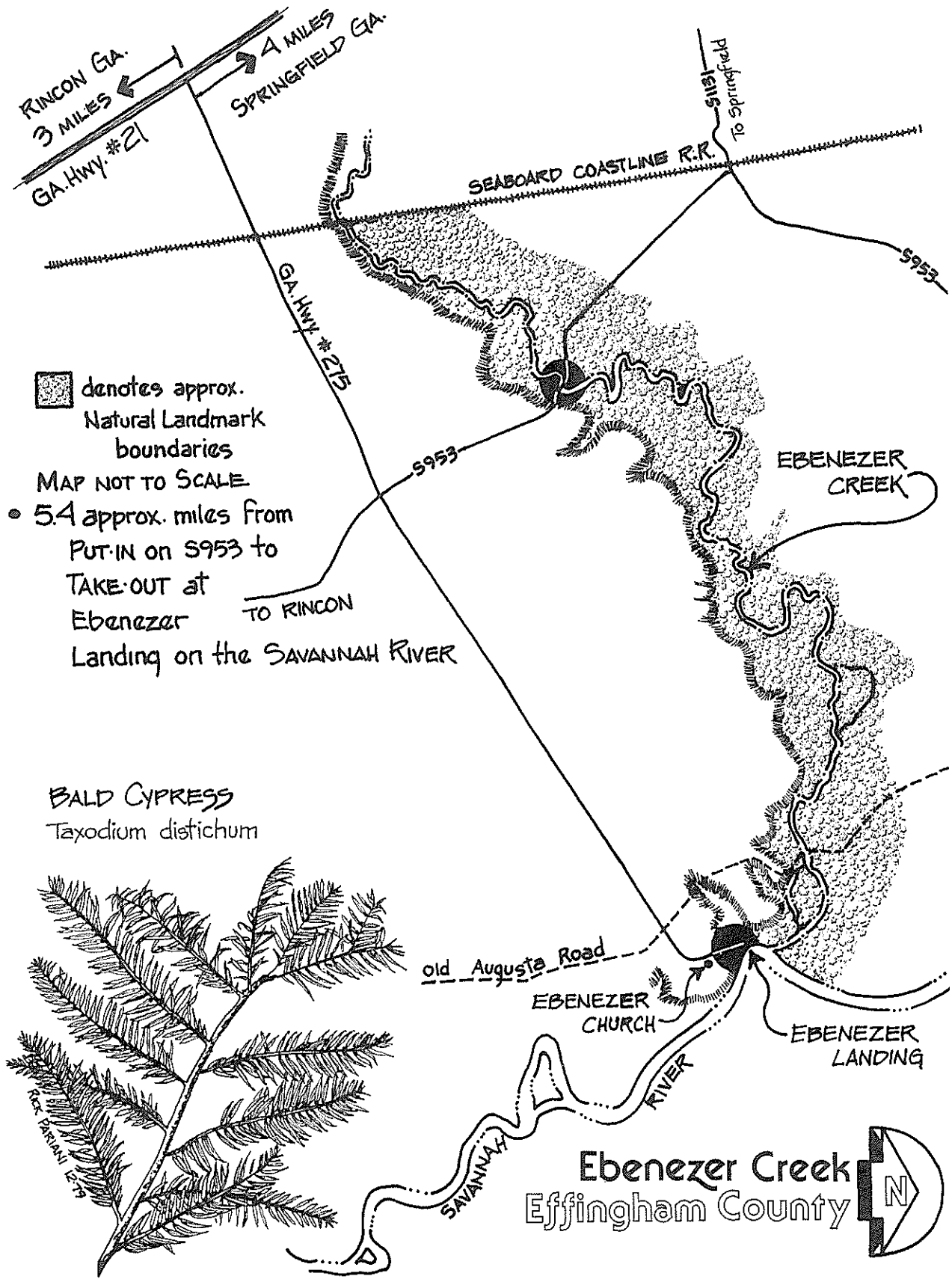
WHEN TO GO:

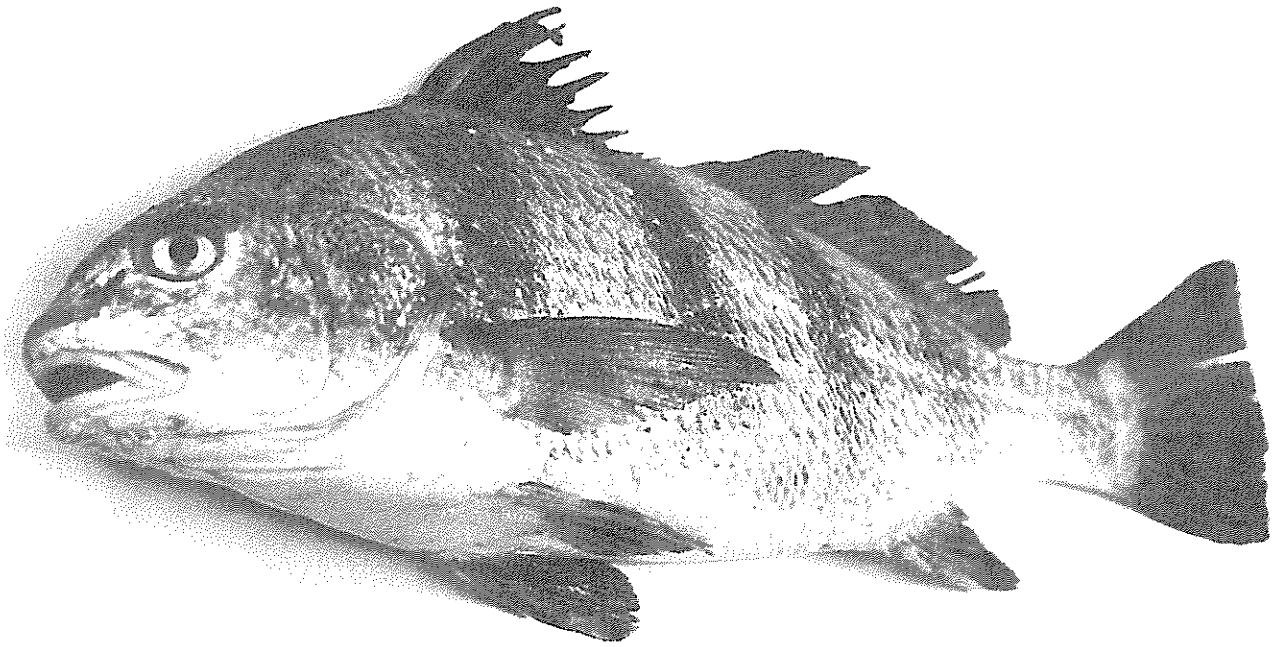
As you might guess, Ebenezer Creek will provide year-round canoeing opportunities. In the summer the water is darkly stained and lower water levels will expose and enhance the extent of buttressing. Fishing is good beginning in late spring and lasting throughout fall. During winter and early spring certain anadromous fish (shad and blueback herring for example) may use the area for spawning. In April or May, you might just hear the bellowing of an American alligator on occasion. Somewhat higher water levels will enable you to explore the section from S953 to the railroad bridge, an area which is influenced to a lesser extent by the 'damming effect'. In any event, take your time and gear yourself to the Ebenezer's slow, lazy pace.

HOW TO GET THERE:

Outside of Savannah, get on Georgia Highway #21 and travel through Port Wentworth and Rincon. At the first major intersection north of Rincon take a right onto Georgia Highway #275 and follow it all the way down to the Savannah River. Take the dirt road to the left down the bluff to Ebenezer Landing. Leave a vehicle here and go back along #275 to the first 4-way intersection. Take a right and go to the Creek. Immediately before the bridge is a dirt access road on the left hand side. This road will put you right next to the water.

--Rick Pariani
Map by the author


RINCON GA.
3 MILES
GA. HWY. #21
4 MILES
SPRINGFIELD GA.
SEABOARD COASTLINE R.R.
To Springfield
S151
S953
GA. HWY. #275
denotes approx. Natural Landmark boundaries
MAP NOT TO SCALE
• 5.4 approx. miles from PUT-IN on S953 to TAKE-OUT at Ebenezer Landing on the SAVANNAH RIVER
S953
TO RINCON
EBENEZER CREEK
BALD CYPRESS
Taxodium distichum
Rick Parian 1979
old Augusta Road
EBENEZER CHURCH
EBENEZER LANDING
SAVANNAH RIVER
Ebenezer Creek
Effingham County
N



Fishing For Black Drum

A member of the croaker family, the black drum, *Pogonias cromis*, occurs from New York to Argentina with centers of abundance along the Atlantic and Gulf Coasts from North Carolina to Texas.

This bottomfish feeds on shrimp, crabs, clams, mussels, and other mollusks. The black drum prefers inshore sandy areas such as bays, sounds, channels, and ocean surfs. Concentrations are often found near piers, docks, jetties and bridges.

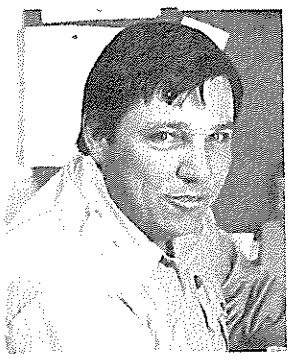
Most species of the croaker family are characterized by the peculiar specializations of the air bladder which enables the fish of this family to produce the drumming or croaking sounds you may hear. The black drum, because of its large size and elaborate sound producing apparatus, is probably one of the loudest and best known.

Using such baits as crabs, fiddler crabs, shrimp and clams, the black drum is usually taken with a "fish-finder" or "bottom rig." Although its strike is often a slow tug, the fish puts up a strong fight. The spring run is in March and April in surf and channel waters and is abundant throughout the warm season until water temperatures cool down in December.

The flesh of small drum (up to 5 or 10 pounds) are quite good eating, but the flesh of larger individuals is coarse and poorly flavored. Larger fish can be deboned and made into fish patties. Adult fish are frequently infested with parasites in both the internal organs and the flesh. These parasites, so far as known, are not harmful to man and thorough cooking would eliminate all possibility of infection.

The current rod-and-reel record in Georgia is a specimen 4 feet long and weighing 70 pounds. It was caught in North Newport River by Myrtie Welborn in July 1975.

--Jim Music, John Pafford



Jim Music

John Pafford

Jim Music and John Pafford supervise CRD's Recreational Fisheries and Fish Tagging Projects, respectively. Their column is a regular feature in *Coastlines.*

Searching For Georgia's Water Borne Past

Batteaus, trawlers, shad boats, dugouts, pirogues ('pē-rōgs), market sloops - these are a few of the many hard-working small boats that form part of the fabric of Georgia's coastal history. During the years of Georgia's colonization, early statehood, and development prior to World War II, the maze of tidal waters linking high ground, marsh and island provided natural highways for transporting cargo and passengers. Waterways snaking through the coastal marshes offered miles of good fishing, crabbing, shrimp and oyster harvesting. Work boats made all this possible, for they were light, maneuverable, and of shallow draft, overcoming the restrictions of tide and current.

In the early colonial days in Georgia and South Carolina, boats and even sizeable vessels were often "plantation" built to serve the needs of hauling produce or other market commodities. Thomas Spalding, owner of Sapelo Island plantation during the early 19th century, sent a boat to and from the mainland nearly every day to fetch supplies and transport plantation goods.

The emerging maritime fishing industry of Georgia and neighboring portions of South Carolina and Florida depended on a variety of small watercraft. Despite an economy and culture heavily dependent on water travel, however, little attention has been given to study of these boats in the Southeast.

One local organization is leaping into the void, planning an extensive study to focus on the origin, design and use of low-country boats

A dugout canoe begins to take shape along the banks of the Satilla River. This craftsman's time, tools and hands alone will create the finished product. (Photo - Ga. Historical Society)

up to 60 feet in "length on deck." The project, under the leadership of the Coastal Heritage Society, headquartered in Savannah, will seek information on traditional watercraft used in this region between 1650 and 1950. Eventually, the Society's findings will be published in a book, complete with photographs and drawings, but the information will also serve as a basis for possible future reconstruction exhibits and demonstrations.

Rusty Fleetwood, a native of coastal Georgia, heads up the Coastal Heritage Society's effort, which is funded partially by a grant from the National Trust for Historic Preservation. Fleetwood sees the current study as the first step toward a broader appreciation of our water-borne past.

"Very little information has been compiled on the traditional working boats of the area, but the lifestyle of this region -- at least until large scale development of railroads and highways -- was tied to the water... the logical means of transport."

Fleetwood does not know whether the region will prove to have spawned any really unique types of craft, because no research of any magnitude has been done here.

Residents of coastal Georgia, South Carolina, and Florida can help piece together this aspect of our heritage. The Coastal Heritage Society is actively seeking information on craft used or built in the area, particularly original photographs, sketches, drawings, half-models, or personal experiences with boats of the coast. Documenting the small craft heritage of our corner of America will be a challenge, but unless the effort begins soon, more links to the past may be lost.

Contact: Watercraft Research Project, Coastal Heritage Society, Savannah, GA 31402, (912) 232-0686 or 232-3945.

Pulp Mill Regulations

Leonard Ledbetter, Director of the Environmental Protection Division (EPD), announced in late February that the Board of Natural Resources adopted regulations which will lessen the odorous emissions from kraft pulp mills. These regulations are needed for Georgia to comply with the Federal Clean Air Act of 1977.

Ledbetter explained that the regulations require the control of Total Reduced Sulfur (TRS) compounds. These compounds are a by-product of the sulfate kraft pulping process and are the primary constituent of the "paper mill odor."

Georgia, a national leader in kraft pulp production, will have eleven (11) mills affected by these regulations. A twelfth mill currently under construction is subject to more restrictive regulations. The regulations will require that the existing eleven mills comply by March 1, 1984, and will reduce odorous emissions by more than 75 percent of the current levels.

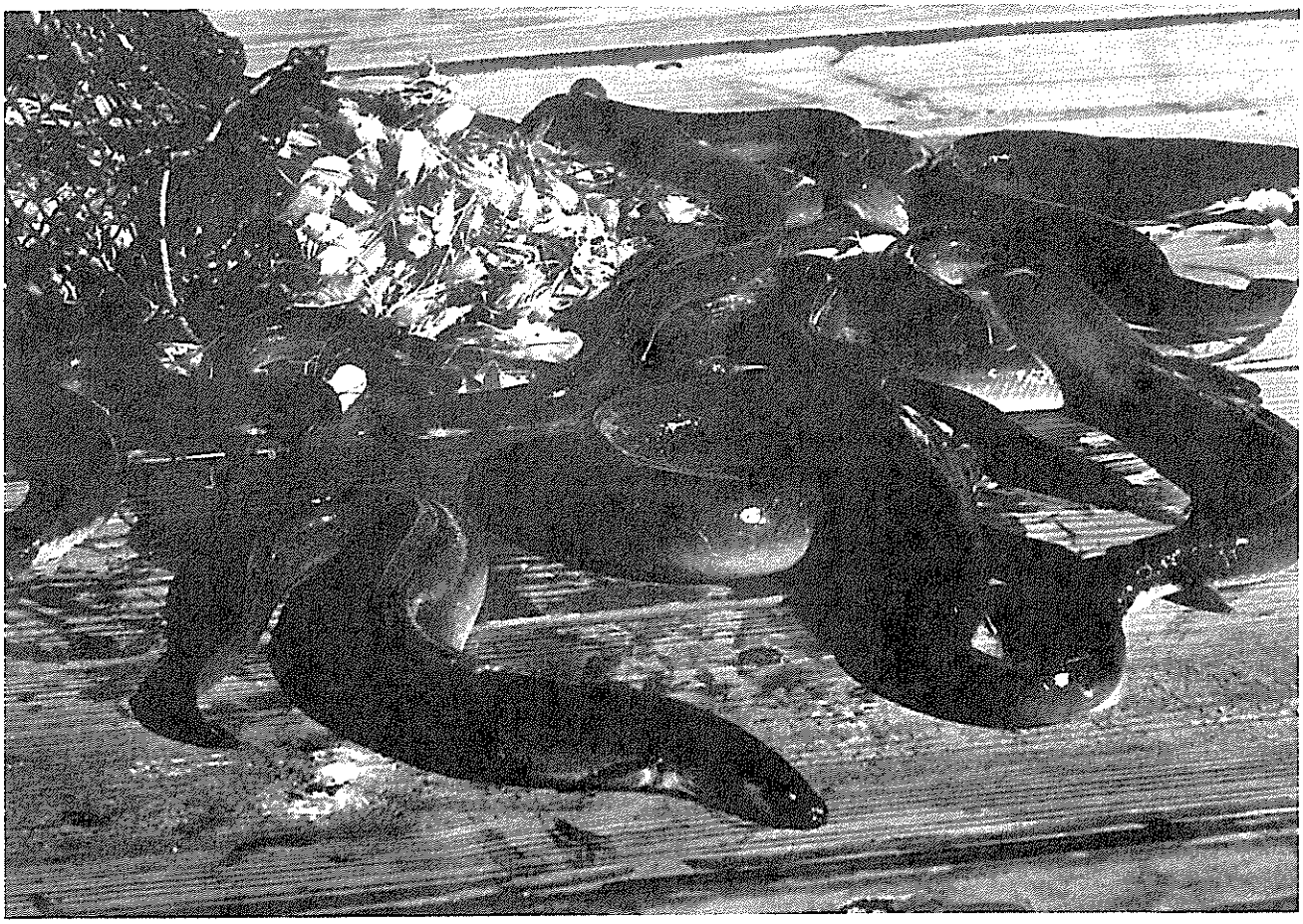
Ledbetter stated that these regulations will not completely eliminate the odor problem, but will significantly reduce the odor that Georgia's kraft pulp mills emit in the surrounding counties.

EPD Advisory Committee

The statewide Environmental Advisory Committee to the Environmental Protection Division (EPD), Department of Natural Resources, will meet April 17, 1980 at 10:00 a.m. in Room 605, 270 Washington Street, S.W., Atlanta, Georgia.

At the meeting the State/EPA Agreement for fiscal year 1981 will be discussed. The State/EPA Agreement is a partnership agreement between EPA and the Environmental Protection Agency in which both parties establish and identify priorities in environmental issues. This serves as a management tool and allows the state's resources to be handled in the most economical and effective manner. The Advisory Committee will make recommendations to EPD for consideration in the draft before it goes to public notice.

For further information contact Liz Carmichael Jones at (404) 656-4713 or write to EPD, Room 823-A, 270 Washington Street, S.W., Atlanta, Georgia 30334. All Environmental Advisory Committee meetings are open to the public.



The eel is a true fish. Notice the long dorsal fin, small pectoral fins and light underside of this yellow eel.

Rediscovering the Eel

Long ago they were believed to originate from horse hairs dropped into streams and rivers. Early scientists surmised their reproduction to be the result of rubbing their slender serpentine bodies against hard rocks, sheering off strips of skin to spawn new generations. For years, their commercial potential has silently slept along the Atlantic coasts' rivers, streams and estuaries.

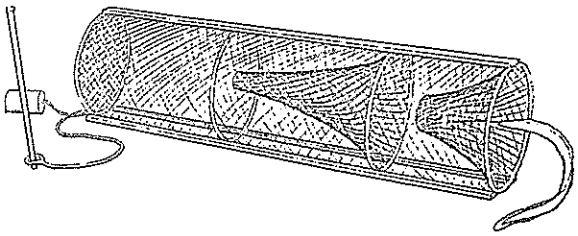
The American eel, *Anguilla rostrata,* has often been a misunderstood creature. Dark, slithering and slimey, its appearance was one few cared to look at or to touch, much less consider eating. Today, however, as European and Japanese demands for *Anguilla rostrata* steadily increase, U.S. fishermen, biologists and others are rediscovering the migrating, mating and feeding habits of the eel and also utilizing the eels potential as a fishery resource.

Prices for eels in the U.S. currently range from $0.90 to $1.10 a pound from the boat. Shipped live or frozen to foreign markets, eels may then be smoked, barbequed, pickled or jellied and command prices of $12-$20 per pound. The relatively small amount of time and dollars required for eel fishing is constantly attracting more people to this endeavor as a full or part time business.

In Georgia, eel fishing is presently allowed on an experimental basis. Until April 15, 1981, eel fishermen are required to report the number and size of traps being fished, the location of the traps, pounds of eels caught and the species and pounds of fish than eels caught.

Fishermen are restricted to using cylindrical pots or traps between 9 and 15 inches in diameter with lengths no greater than 36 inches. Square pots or traps may be no larger than 24 inches x 24 inches x 15 inches. Mesh size for either trap may be no smaller than one

inch by ½ inch except for the throat or muzzle on round traps.



Cylindrical eel trap (after Dumont and Sundstrom, 1961).

Initial outlay for construction of eel traps usually runs between $17-$20 per trap. This, together with the cost of fuel, bait (eels seem to prefer crushed female horseshoe crabs, menhaden, herring roe, or shrimp heads), transportation, holding facilities (eels must be allowed to eliminate all wastes in their system before they are shipped), and miscellaneous gear consist of the major expenditures eel fishermen may encounter.

Georgia's coast seems to be teeming with eels. It has been estimated that one fishing 25 traps may easily catch 200 pounds of eels per day. From the brackish estuaries to freshwater rivers hundreds of miles upstream, *Anguilla rostrata* may be found frequenting drop-offs and holes in rivers or along piers, docks, pilings and nearby the waters of seafood processing plants. They appear to move at night, feeding on crustaceans, worms, snails, insects, and even other eels. During daylight hours they rest, burying themselves in the mud or hiding in small nooks and crannies.

The American eel is a true fish. In adult form its slender and snakelike body tapers to a point at the tail. The dorsal fin runs down the final ¾ of the eel's body. Its small pectoral fins protrude behind the head and are located just in front of the eel's small gill openings. Midway through the adult phase the eel develops scales. From its earliest stages it can be found to have a mouthful of small needle-like teeth.

However, the myths, misunderstandings and strange tales surrounding the eel's orgins are not without warrant. It appeared to early scientists that the eel was simply not equipped for reproduction. It was not until 1777 that an ovary was first discovered in an eel. Another hundred years would pass before an eel's testis was identified. Dissected eels from streams, rivers, and estuaries were found never to contain roe or milt. How then did they reproduce?

It was later discovered that mature eels reproduce hundreds of miles from their inland or shoreline habitats. Scientists believe the spawning grounds of the American eel, common along the Atlantic coasts of the U.S., Canada and Greenland, to be somewhere in the Sargasso Sea between Puerto Rico and Bermuda. It is here in the southwest North Atlantic that the life cycle of *Anquilla rostrata* begins.

During its life, the eel will undergo five basic phases of development: leptocephalus, glass eel, elver, yellow eel and silver eel. The complete cycle may last from 8-25 years as the eel first drifts to continental waters, migrates persistently upstream to fresh water, resides here, and somehow returns to the ocean where its life began years before.

A typical daily catch from this cylindrical eel trap may yield 7-10 lbs. The eels must first be purged before transportation to market.

After hatching, the eel begins its life as a small, flat, willow leaf-like leptocephalus (Greek for "flathead"). Approximately ½ to ¾ inches long, the leptocephalus drifts northward from the Sargasso under the influence of ocean currents. After a journey that lasts from one to two years, the leptocephalus will lose its flat shape as it approaches continental waters. Assuming the tubular form found in adult eels, the leptocephalus metamorphosizes, or transforms, into a transparent "glass eel," about 1½ inches to 2¾ inches long.

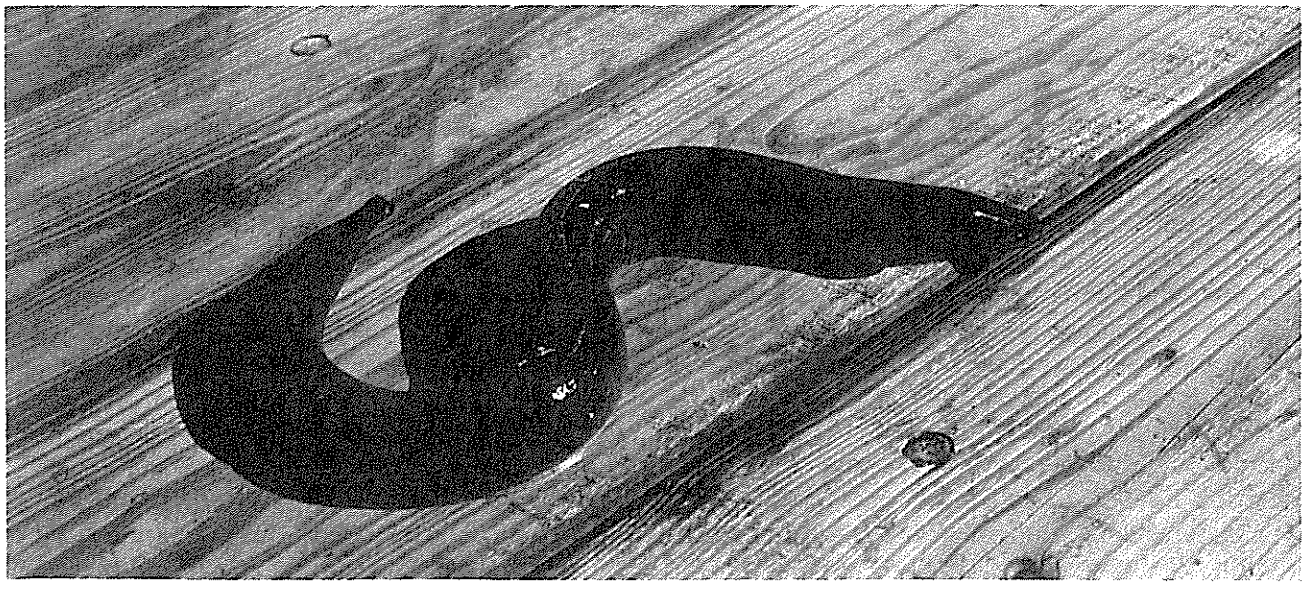
The glass eel moves against currents to fight its way into estuaries, streams, and rivers. As it does so it loses its transparency, gaining instead the olive or deep green of the adult eel. This form of eel is known as the elver. While some elvers remain in brackish waters, many nocturnally travel up coastal rivers and streams to fresh waters. In one or two months elvers may travel over one hundred miles against the current. Their persistence in upstream migration is phenomenal. Dams, rocks and even small areas of dry land do not deter the elver from its upstream task. It is believed that the elvers that remain in brackish water become male eels while those residing in fresh water become females. Commercially, elvers are important in eel farming efforts in Europe and Japan.

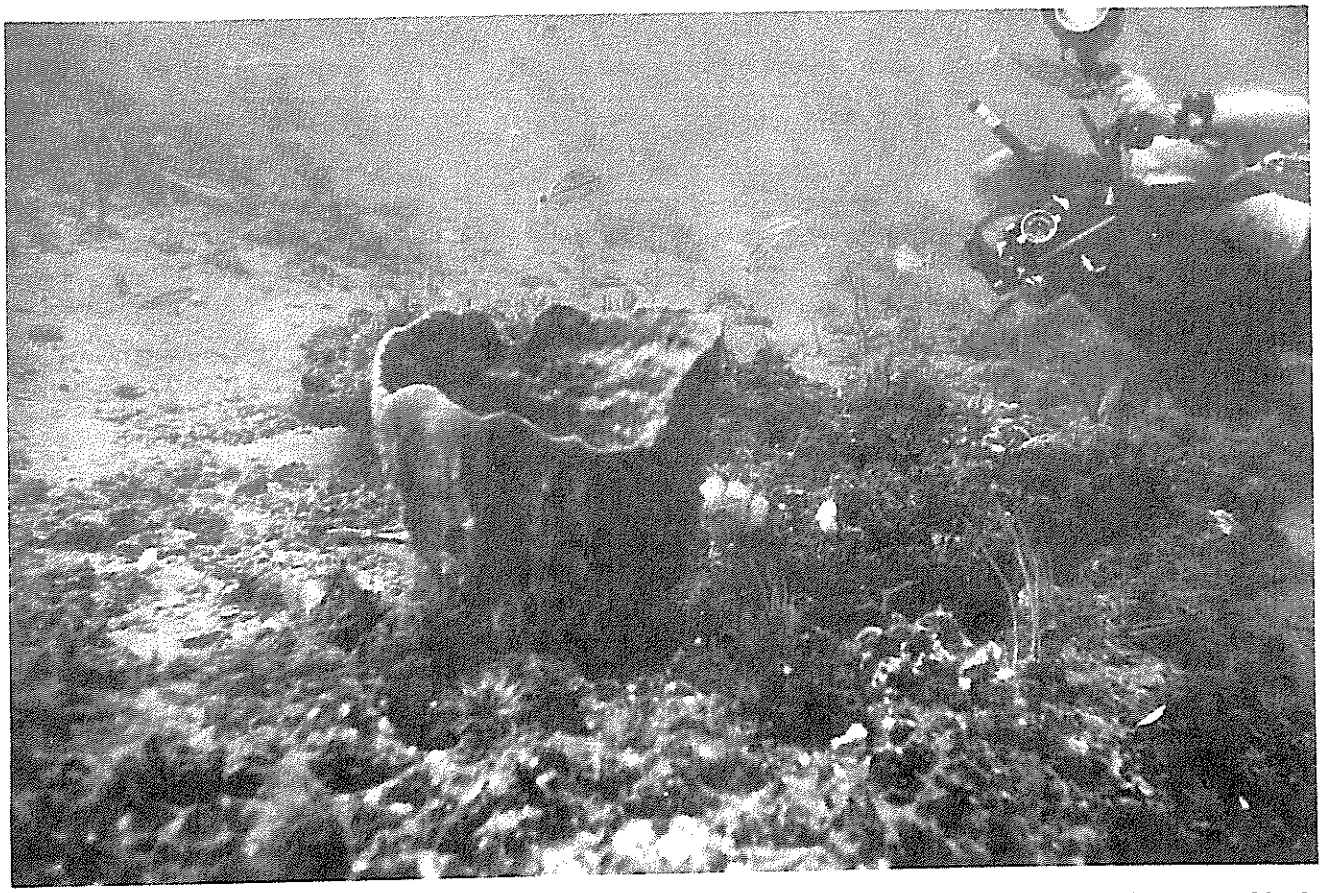
The eel now begins its major phase of growth and development. During the yellow eel stage of growth, mature females may reach 30-42 inches in length and weigh from 2½ to 3½ pounds. Males are usually smaller, averaging 1-2 pounds and usually growing no bigger than 18 inches. The eel's yellowish underbelly lends itself to the eel's identification of this period. The yellow eel phase is the longest stage of eel growth, lasting from 5-20 years. Contrary to movement in earlier phases, the yellow eel remains somewhat stationary during this time.

It is in the fall of each year that certain mature eels begin to undergo several changes transforming the eel into its final stage of development. Their yellowish underside turns silver or bronze, their eyes enlarge, feeding ceases, sexual development increases and their skin's mucous layer (used to maintain the eel's salt balance), thickens. The eel that will untimately return to the Sargasso Sea to provide a new generation of eels is called the silver eel. Between late April and mid-November, the silver eels undergo their 2-3 month exodus to the Sargasso Sea to mate, spawn and ultimately die.

The 10 to 15 million pea-sized eggs the silver eel releases here will, in time, become part of the growing commercial utilization of eels. Perhaps they will be the elvers used in eel farming in Japan or for cobia fishing off Georgia's coast. Possibly they will be the yellow eels shipped overseas to be jellied, smoked or barbequed. Conservative predictions in Georgia alone estimate a potential 10 million dollar market for eels in the near future. The American eel truly has been rediscovered.

--Steve Olsson





This basket sponge and the tomtates (reef fish) swimming around it are typical of marine communities assessed in the BLM study. (Photo by Henry Ansley)

On The Bottom

Scientists from the Coastal Resources Division (CRD) and the South Carolina Wildlife and Marine Resources Department (SCWMRD) have completed winter season sampling of the live bottom areas off the coasts of South Carolina, Georgia and Florida. These operations are the first in a series of samples to be taken in the winter and summer months for the Living Marine Resources study funded by the U.S. Bureau of Land Management.

The CRD biologists and divers have been "on call" since mid-January to participate in diving activities to sample and assess the marine communities at six sampling stations. The sites range in depths from 60 to 130 feet. In winter diving, the divers must simply wait for weather and sea conditions that will permit safe collection activities. Though the winter cold is not a factor, strong winds and rough seas often prohibit diving operations.

The divers, having finally received the word that tomorrow is a "go" day, are ready. Once the R/V BAGBY has located the live bottom in a pre-designated area and is on station, the first task is to position the sampling gear in the area of the live bottom. The gear (two underwater suction samplers, a meter square sampling grid, 360° metal disc, five 1/10m^2 grids and tools for scraping the bottom) is lowered over the side of the vessel in a metal cage and marked at the surface with large net buoys. The divers are now ready to proceed with sampling. They work in teams of 2 to 4 divers with clockwork precision to obtain the needed collections and samples. The first dive team has the responsibility of moving the sampling gear closer (if necessary) to the area of live bottom to be sampled, photographing the general bottom type and counting and photographing fish in the area. Once this dive

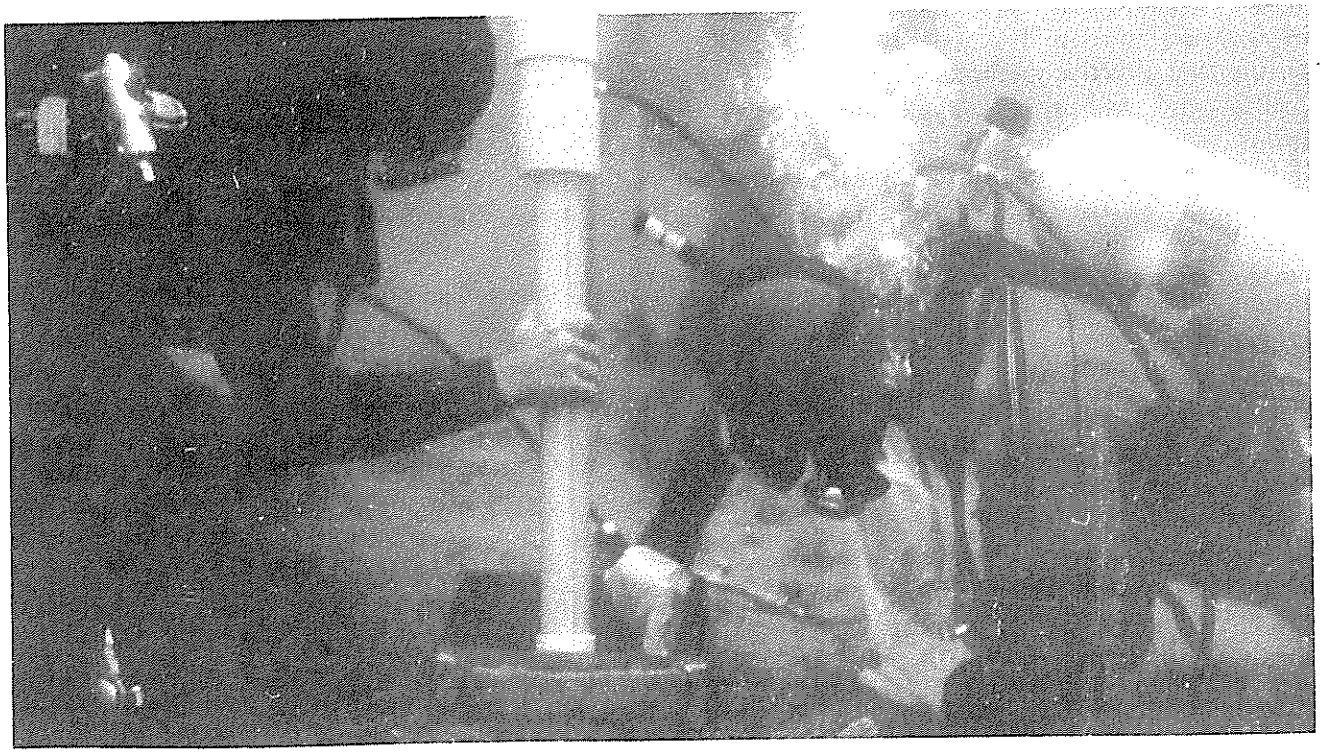
team is back on board and has been debriefed, the second dive team prepares to enter the water. The mission of the second dive team is to set up the 5 random $1/10m^2$ grids and photograph them. The photographs will result in permanent records of the areas being sampled. The next two dive teams then scrape and suction sample two each of the five grids and return the samples to the vessel. The last dive team has the responsibility of sampling the fifth grid and cleaning up the gear on the bottom. If weather, time, and air (the number of SCUBA tanks that can be taken is limited) permit, divers may make a second dive to take additional photographs or collect fish for stomach analysis.

Although each dive team is busy with the required work, bottom time being limited with depth, (i.e., 25 minutes at 100 feet; 10 minutes at 130 ft.) there is usually a little time to scan the scenery. A panorama of sizes, shapes and colors can be seen. Large purple sea whips, nearly 2½ feet tall are seen with other soft corals and sponges of all shapes, sizes and colors scattered around. Sea urchins are often seen hiding under the edges of hard corals and rocks. Fish are plentiful too. Black sea bass, red pogies, and blue angelfish are often seen in fairly large schools. A moray eel is spotted shyly slithering away from a diver's camera. The amount of life in these areas is tremendous.

Back in the laboratory, CRD biologists have the awesome task of identifying the Echinoderms (sea stars, sand dollars, brittle stars and sea urchins), Mollusks (snails and clams), Ascidisns (sea squirts) and sponges, collected during the diving and dredge/trawl sampling. SCWMRD collects samples by trawling and dredging at the six dive stations as well as three deeper stations. The three types of sampling gear are used to insure complete assessment of the areas being studied.

Some of the groups provide taxonomic difficulties and biologists are already in contact with colleagues and experts at the U.S. National Museum in Washington, D.C. and other laboratories to gain needed information. Identification by CRD and SCWMRD biologists will result in a "total" picture of the live bottom areas and their relationship to recreational and commercial fishing resources and will in turn aide managers and officials in making decisions in all aspects concerning offshore oil explorations.

--Debbie Blizzard



CRD divers collect living marine samples from a 0.1 meter² area. Large samples are scraped and collected while smaller inhabitants are drawn up in the suction tube shown here. (Photo by Chuck Cowman)

Offshore Energy Activity: What Next?

The recent departure of Glomar I, Exxon Corporation's semi-submersible drilling rig, from Georgia's offshore waters may mark the end of exploratory drilling operations on tracts now leased to oil companies off our coast. Some petroleum companies may possibly exercise their options to probe other tracts for gas and oil, but the exploration track record so far has not been promising. Most of the companies will probably choose to wait until the next round of lease sales, scheduled for August, 1981.

What does this temporary exploration slowdown mean for Georgia? For state agencies monitoring planned development of the Outer Continental Shelf (referred to as the OCS), it provides a much needed period in which to gather new information, study and analyze that information, and coordinate with the federal government to make sure that future lease sales are conducted with the best possible knowledge of environmental conditions in those areas.

State officials work with the federal government and private industry to decide what precautions are needed during exploration activity. The state also wants to ensure that effective methods are available to contain and clean up an oil spill, should one occur.

It is sometimes difficult to keep track of all the players on the OCS development scene. The most visible, of course, are the oil companies themselves. Companies that have sunk a tentative probe and more than a few dollars into the ocean floor off Georgia or northeast Florida are Getty, Transco, Tenneco, and Exxon.

On the federal level, the Bureau of Land Management (BLM) selects tracts of ocean floor for possible leasing. It contracts for studies to provide the agency with information about the currents, water chemistry, geology and other environmental conditions within the areas they consider leasing. BLM is responsible for conducting the final lease sales.

The United States Geologic Survey (USGS) also nominates offshore tracts for lease sales and supervises activity on the tracts once they are leased to oil companies. It reviews environmental reports, applications for permits to drill, and exploration or production plans. USGS is also responsible for making sure that the proper equipment and technology are available to clean up possible oil spills.

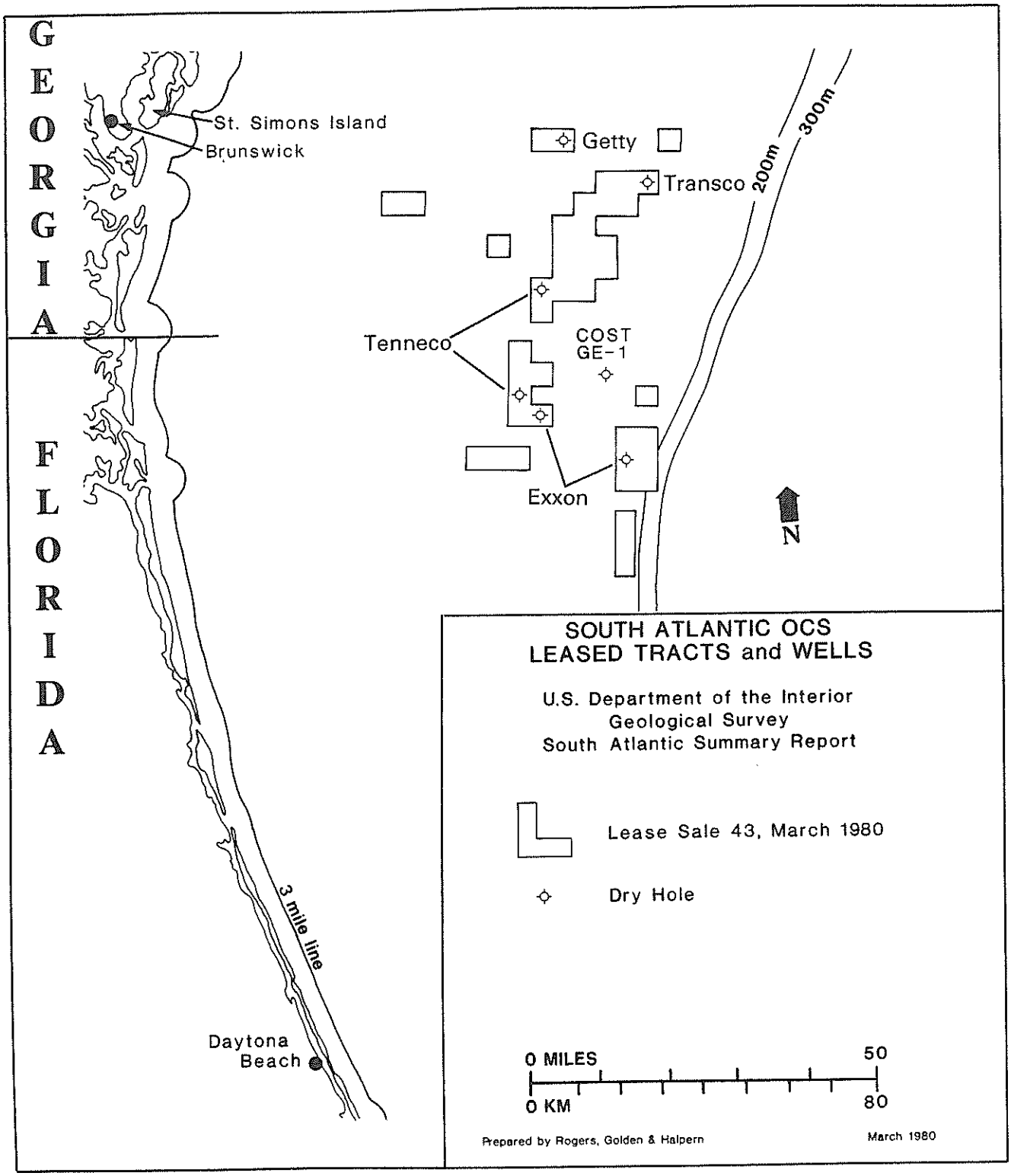
Within Georgia, the agencies involved in OCS development are the Office of Planning and Budget in Atlanta, and the Coastal Resources Division of the Department of Natural Resources in Brunswick. These two groups help set state policy regarding OCS matters, reviewing reports, plans, and industry applications. Together with representatives from North Carolina, South Carolina and Florida, Georgia state officials advise the federal government of South Atlantic states' concerns regarding energy resource development off their coasts, and the need for further environmental studies when information is lacking.

Learning about the remote and complicated marine environment requires many different kinds of studies. Special buoys are set out to record ocean conditions over long periods of time. Biologists monitor the habits of protected animal species in the marine world. Recently, an oil company conducted a project to measure how far from its exploratory rig ocean currents carried drilling materials. It is hoped this information will help biologists determine how close to a live bottom habitat drilling can safely take place.

These and other studies help resource managers learn how best to protect existing fisheries resources off the South Atlantic coast. Coastal Resources Division biologists have joined scientists from the South Carolina Wildlife and Marine Resources Department in a new study under contract from BLM. The purpose is to gather new information about live bottom communities off the coasts of Georgia, South Carolina, and Florida before additional tracts of ocean floor are leased. Participation in this study, which was described in the January-February issue of **Coastlines**, underscores the State of Georgia's commitment to protect its fisheries while at the same time helping in the search for necessary

energy resources -- a search that will doubtless continue for some time in the South Atlantic.

--Jenny Phillips



This map shows the location of tracts leased in early 1978, and the number of exploratory wells drilled as of March 1980. For each area encompassed in a lease sale, at least one preliminary COST well is drilled. The COST ("Continental Offshore Stratigraphic Test") effort is sponsored jointly by various oil companies interested in sinking a test probe in the area. The leases sold in March 1978 will expire in March 1983.

Taggers Looking For Black Drum, Channel Bass

Biologists on the CRD fish tagging project are seeking assistance from local fishermen in tagging more black drum and channel bass (red drum). Fishermen reporting the location where these species are abundant not only contribute important information to the project, but also increase their chances of cashing in on a tagged fish. To date, CRD biologists have tagged only 50 black drum as opposed to 1700 spotted and summer trout and 500 flounder. A major emphasis in tagging will be directed toward both black drum and the channel bass during 1980.

With the project a little over one year old, CRD biologists report that they now have 3,369 inshore sportfish tagged in the St. Simons and St. Andrews sounds.

Tag return data indicates that spotted sea trout are not moving any great distances. Most movement has been random and at distances less than five miles. The greatest distance recorded thus far for spotted seatrout was 22 miles. Sheepshead also have shown very little movement to date. However, time may show some distinct movement patterns. The maximum distances traveled for each of the species under investigation are listed below:

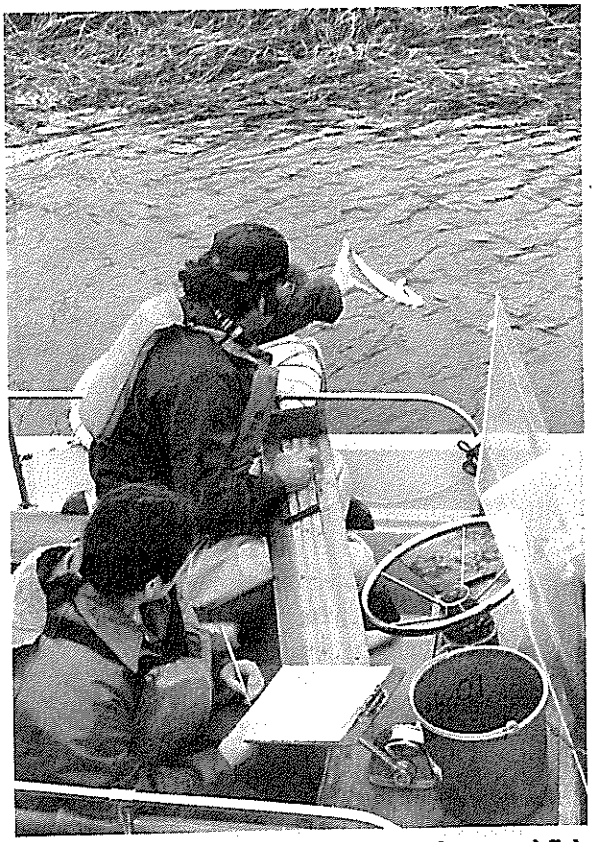
SPECIES	MAXIMUM DISTANCES (MILES)
Black Drum	117
Red Drum (Channel Bass)	87
Whiting	69
Flounder	48
Spot	38
Spotted Sea Trout	22
Summer Trout	22
Atlantic Croaker	17
Sheepshead	13
Rock Sea Bass	5

Tag team biologists point out that the yellow vinyl tag streamer may be completely encrusted with fouling organisms such as bryozoans, barnacles and seaweed and may appear as a parasite on the fish's abdomen.

Fishermen are urged to send in their tags promptly after catching the fish so that all information, such as the exact date and location, will be correct when recorded by the biologists. Also, if possible, the biolgists would like to see the fish for measurements and other observations.

To date the return rate is around five percent and biologists say that your chances are good at catching a tagged fish. So be on the look out, because tagged fish carry rewards of one, five and ten dollars. For further information, contact the CRD office at 1200 Glynn Avenue in Brunswick or phone (912) 264-7218.

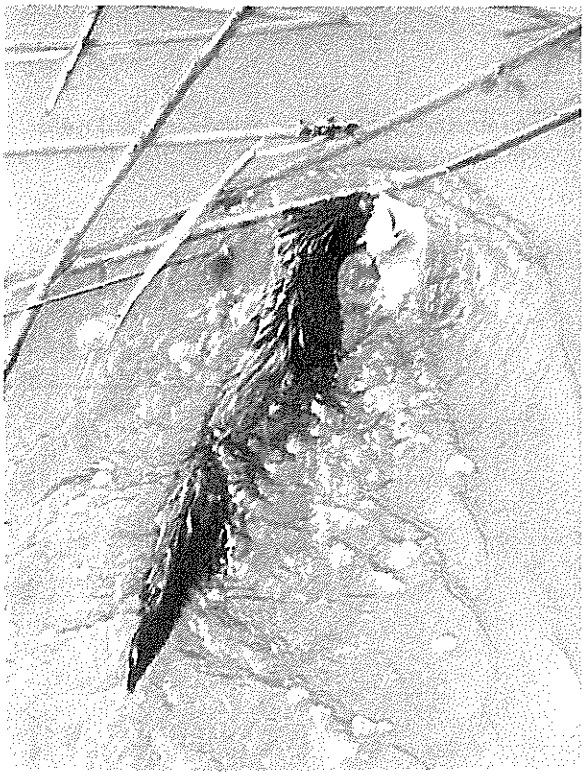
--Jim Music



Biologist John Pafford returns a newly tagged fish back into coastal waters. YACC Karen Hunt records fish specie, size and location where tagged.

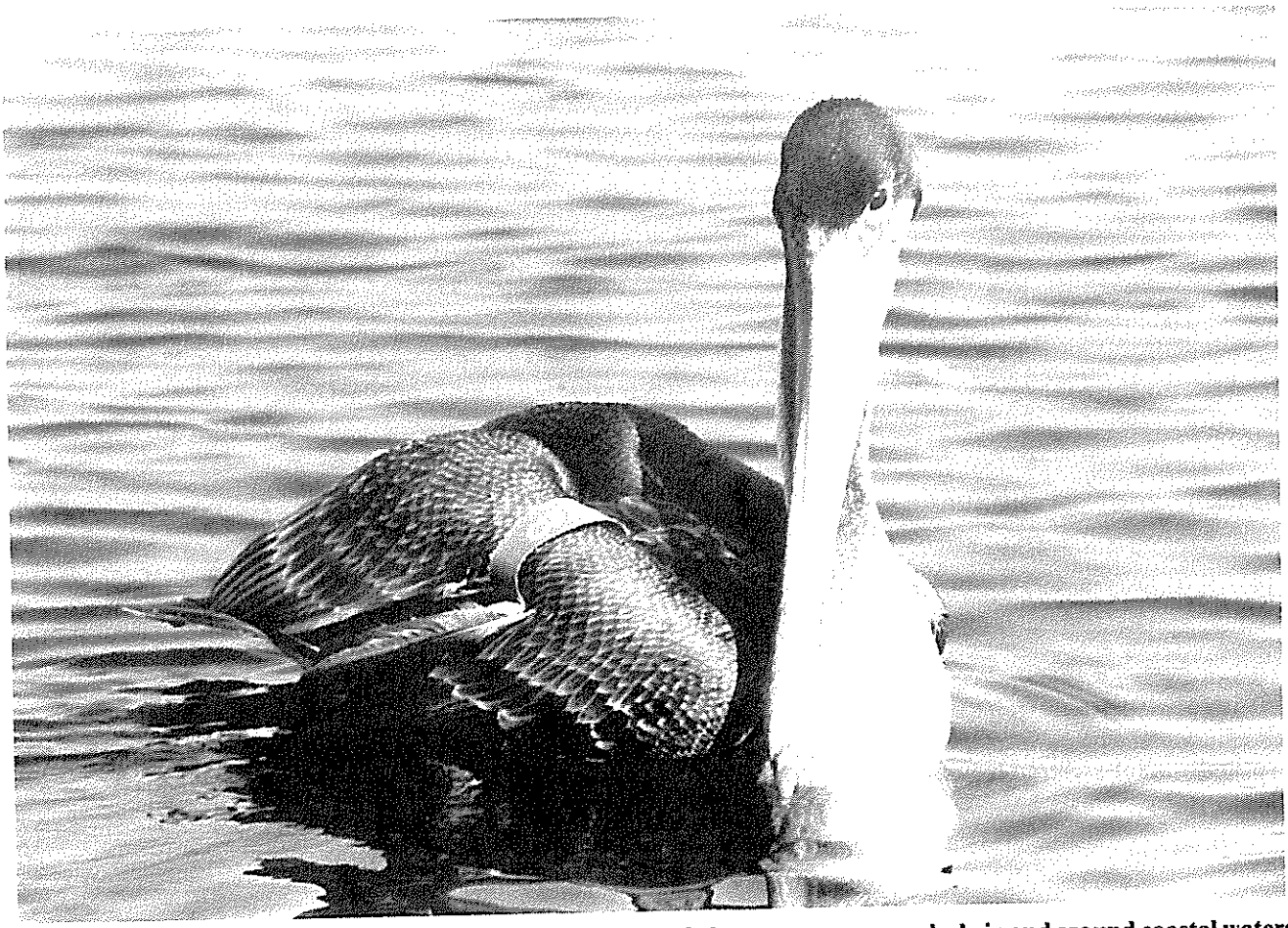
Et Cetera . . .

CRD secretarial-clerical staff keeps office operations running smoothly. Left to right are Brunswick High student Pam Pickren; Anita Futch, secretary; Dale Johnson, fiscal officer; LuAnn Brigdon, secretary; and Debbie Dixon, receptionist. (Not pictured is Lucy Peeples, principal secretary and supervisor.)



SLENDER BODIED SUSPECT. This mink stealthily makes its way from a nearby CRD fish trap. A semiaquatic mammal, the mink feeds mainly on fish while residing in coastal marshlands. Minks are closely related to otters and weasels.

Dividing her time between the ocean depths and the CRD laboratory, biologist Debbie Blizzard supervises the Bureau of Land Managements Living Marine Resources Study.



Though it is an endangered species, the brown pelican has lately been seen more regularly in and around coastal waters. Its continued survival is largely due to tagging (notice band on right wing) and protection efforts of local, state and federal organizations. (Photo by Virginia Baisden)

Coastal Resources Division
Department of Natural Resources
1200 Glynn Avenue
Brunswick, GA 31523

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