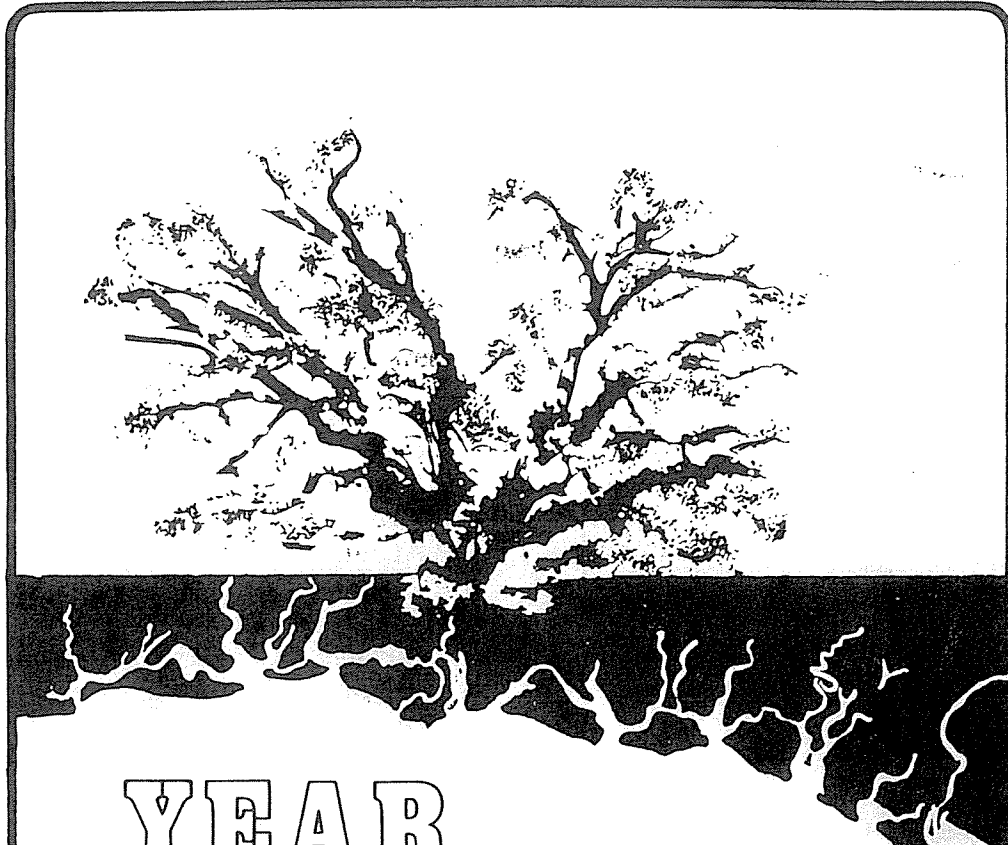


January-February, 1980

Volume 3, No. 1

Coastlines

GEORGIA



GEORGIA'S

COAST



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Joe D. Tanner, Commissioner

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Dr. Robert J. Reimold, Director

Steve Olsson, Editor



Cofer Elected Chairman Of DNR Board

St. Simons Island native Sam Cofer was elected Chairman of the Board of Natural Resources on Wednesday, January 23 at the regular monthly meeting of the Board in Atlanta.

Upon his election, Cofer said, "I intend to look after the best interests of Georgia's valuable natural resources so that all citizens, present and future, will have an opportunity to enjoy and utilize them."

Appointed to the Board by Governor George Busbee in July 1975, Cofer has previously served as its Secretary and Vice-Chairman.

Born in Washington, Georgia, Sam Cofer has lived on St. Simons Island since 1930 and has hunted and fished extensively throughout the state. He is active in numerous civic and public service organizations throughout the United States.

"I want to assure everyone that while I am not easily swayed by special interest groups, I will always find time to discuss anyone's concerns about natural resources in the state of Georgia," Cofer said.

The Board also elected Dolan E. Brown, Jr. of Twin City, Georgia as Vice-Chairman and A. Leo Lanman, Jr. of Roswell, Georgia as Secretary. Together with Cofer they will serve a term of one year.

Georgia's Coast In The Eighties

It was Robert Frost who wrote "Two roads diverged in the woods; I took the one less traveled and that made all the difference." Coastal Georgia, like Mr. Frost, has followed the less traveled pathway in terms of traditional coastal development and management, and that has made all the difference. Development along coastal Georgia has been slow, deliberate, and generally carefully planned.

During the decade of the Seventies, the state continued to follow the pathway fewer states have chosen by acquiring Sapelo and Ossabaw Islands. Consequently, the cultural, historic, and natural resources of these areas are set aside for present and future generations. In addition, the Federal government has purchased Wassaw, Blackbeard, Wolf, Egg and Cumberland islands. These areas are now managed for a diversity of wildlife and recreational uses. Meanwhile, private development interests have proceeded on

Tybee Island, Sea Island, St. Catherines Island, St. Simons Island, and Little Cumberland Island. The co-existence of conservation and land development continues to set coastal Georgia apart from other coastal states.

In the decade of the Seventies, coastal resource management in Georgia focused on science and technology transfer. Resource management agencies started to recognize that the latest discoveries of science and technology could and should be applied to everyday coastal management decisions. By the close of the Seventies, proclamations made some three to four decades earlier by such leaders as Aldo Leopold and Eugene Odum, were finally reaching the ears and minds of coastal citizens. The term "conservation" -- assuring wise use -- began to make an impact on the managers and the lawmakers. No longer was it acceptable to manage a resource by a certain calendar date, nor was it reasonable to permit a certain



Georgia's 475,000 acres of salt and brackish water marshes play a vital role in coastal ecosystems. Providing food and shelter for innumerable birds, fish and mammals, they also buffer coastal uplands from severe weather conditions.

percentage of the coastal area for decimation without guidelines or criteria. An awareness developed that there are no longer adequate quantities of coastal resources allowing someone to catch all the fish and shrimp he/she might want to. The "all for everyone" philosophy was questioned by many who wanted to assure sufficient quantities of coastal resources for all users -- sport fishermen, commercial fishermen, vacationers and photographers, divers and others.

Although universities and resource managers have worked closely together for decades in agricultural matters and in the management of fresh water fish and wildlife, the decade of the Seventies was the first time science and technology were actually incorporated into coastal resource management legislation. The early result of one such science - technology transfer was the commercial shrimp catch for Georgia in 1979



Wind and water constantly shift and sculpt Georgia's coastline. Here on Jekyll Island slender pines take a futile stand against the encroaching waters.

when over 9.6 million pounds (heads on) of shrimp with a dockside value of over 25.2 million dollars were landed. The value of this record catch was nearly 200% better than any shrimp harvest in recorded Coastal Georgia history.

Do improved shrimp harvests, better sport fishing, marsh and beach habitat conservation all mean the work is over? Are coastal laws for Georgia adequate for the future? Do we have all the necessary knowledge to manage our coastal resources to the satisfaction of the millions of people who live and enjoy the coastal Georgia setting?

The decade of the Eighties is just the beginning of what I feel will be a closer meshing of science and technology with coastal law making and resource management. Georgia's coastal zone (the six coastal counties and extending eastward in the Atlantic Ocean to the 200 mile Fisheries Conservation Zone limit) represents the springboard from which pioneering oceanic endeavors are being launched. In the Eighties, I am sure we will see more interest in exploration and development of energy off Georgia's shores. At the same time I hope we will see more efforts to guarantee that energy activities remain compatible with valuable offshore fisheries resources. We may also witness the siting of new industries in coastal Georgia. By applying newly discovered technology, these industries will further utilize seafood protein that is now harvested but discarded.

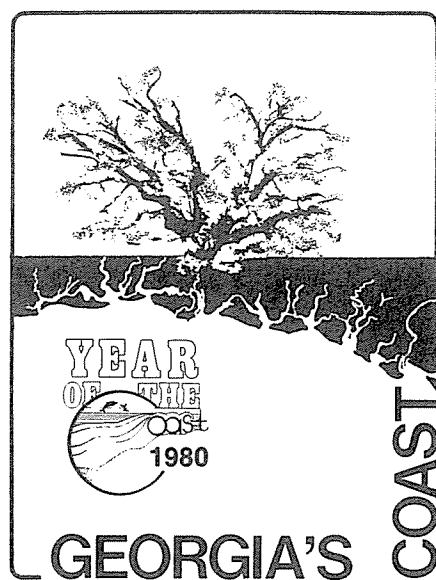
I envision one of the major breakthroughs of the Eighties will be the increased emphasis on educating the public to the values and the vulnerabilities of coastal resources. For the first time, the public will want to learn more about the Georgia coast, its past, its present, and its future. Through the use of the estuarine sanctuary (already established in the Duplin Estuary at Sapelo Island) and the proposed marine sanctuary some 17 miles off the coast of Georgia, additional public educational opportunities will be available. Such education will correct the old "all for everyone" concept of coastal resources use that was held in past generations. Just as people learned they must manage deer, turkey, cotton, tobacco, soybeans, or pine forest, so they will realize the need to manage coastal resources to assure their wise use by all people.

I am optimistic that expanded public education will continue the compatibility of preservation and development interests on our coast. With a better educated public, there will be greater appreciation for the "path less traveled" which Georgia has taken.

Georgia has over 30% of all the eastern U.S. coastal salt water wetlands, and the most beautiful, diverse string of barrier islands in the nation, with beaches that are accessible to the public, yet isolated from the threat of exploration. Georgia has a diversity of nearshore and offshore commercial and sport fisheries, with a potential for increased and improved harvest. Georgia's coastal highlands, adjacent to coastal waters are available for future recreational and industrial development.

Take a moment to consider the cultural, historic, recreational, industrial, commercial, and aesthetic values of coastal Georgia. In many states, we frequently hear the complaint "it is too late to do anything about our coast." Georgia has pioneered by following the "path less traveled" in the development and conservation of its coast. Few coastal states, if any, have the tremendous, diverse and time tested assets that are found in Georgia's coastal zone. Make it a New Years' resolution for you and your family to learn more about the coast of Georgia during the Eighties. Your enlightening experiences will make you recognize that you are the greatest benefactors of such a resolution.

--Dr. Robert J. Reimold



1980: The Year Of The Coast

In the second environmental message of his administration, President Carter formally named 1980 as the "Year of the Coast." His purpose was to focus public attention on the value of the coast and on the dangers of further degradation of its vitality. During this year, a huge diverse national campaign will be conducted to educate millions of people about the importance of protecting, conserving and restoring U.S. coastal areas.

The coast, that thin edge of land and water where people and oceans meet, is actually a complex of valuable and fragile resources: estuaries and lagoons, beaches, bays and harbors, islands and marshes. People not only visit the coast for recreation and sport, but whole communities depend upon it for their livelihood.

The Coast Alliance is a non-profit organization which is serving as National coordinator for the "Year of the Coast." The "Year of the Coast" campaign will have strong local emphasis. Workshops, waterfront festivals, beach walks, tours and slide shows are a few ways in which the public will have a chance to participate. Already the Coast Alliance is planning and executing projects and soliciting participation from interested groups and individuals. Further information is available from Year of the Coast, P. O. Box 2708, Washington, D.C. 20013.



DIVE! DIVE! DIVE!

Late January finds Coastal Resources Division biologists working amid wet suits, dry suits, SCUBA gear and assorted pieces of odd-looking equipment. One biologist is fine-tuning her microscope. Two others are spied lowering a long, pipelike object into the Jekyll Island swimming pool, then diving in after it. Preliminary paperwork, forms, logs, and reports abound. And we all know it's too cold to be diving underwater this time of year.

And yet, CRD has undertaken a new, federally-funded study in cooperation with the South Carolina Wildlife and Marine Resources Division to assess marine communities off the coasts of Georgia, South Carolina, and northeast Florida. Despite the fact that all three states have important commercial fishing industries, more

information about renewable fisheries resources is needed to plan for responsible development of energy resources on the Outer Continental Shelf.

The Living Marine Resources study, sponsored by the U.S. Bureau of Land Management (BLM), will allow scientists from both South Carolina and Georgia to look at the organisms that inhabit so-called "live bottom" areas. Live bottoms will be sampled in water depth zones of 19-27m, 28-55m, and 56-100m. Within each zone, three sites will be tested to see what organisms live there, what they eat, and what factors influence their existence.

South Carolina's team of scientists will film the ocean floor by remote television camera at each site, noting what corals, sponges, and

similar organisms are attached to the hard limerock outcroppings known as live bottom. They will list the kinds of fish and other marine creatures observed, and how common these creatures appear to be.

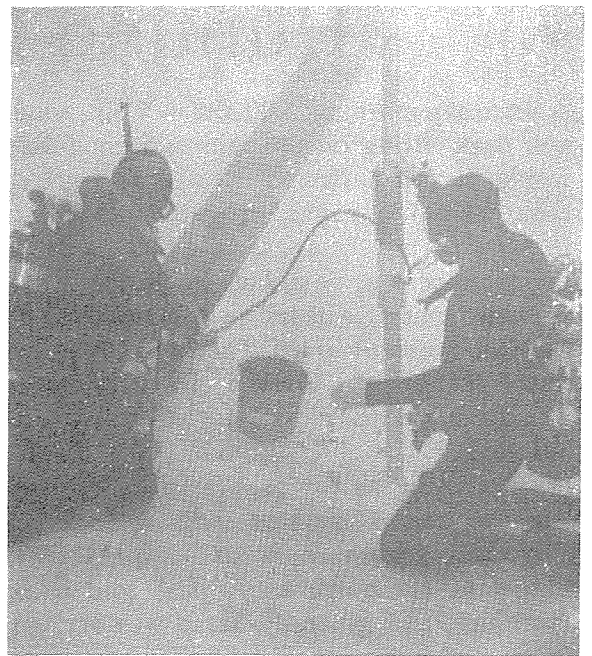
CRD biologists will follow in the path of South Carolina's research vessel. Their primary function will be to personally sample the sites filmed by the South Carolina team. Groups of divers will photograph life in each underwater habitat, and count the numbers of fish in each place. Other divers will select small sampling grids at random and scrape the limerock to remove all attached organisms and other materials encrusting the rock.

Scraping and collecting corals and barnacles off a hard underwater surface may be difficult. To accomplish this task, CRD biologists have adapted a suction device that works much like a vacuum cleaner. As materials are dislodged from the limestone bed, they will be sucked up into a mesh bag at the end of a pipe, the air suction provided by an attached SCUBA tank. This debris will be taken back to the research vessel and sifted, sorted, bagged and returned to South Carolina and Georgia marine laboratories for analysis.

When weather conditions prevent divers from working a particular site, a toothy, metal, shovel-like sampler will be lowered overboard. When the machine hits the ocean bottom, its springs release and it takes a large "bite" of the surface below. This piece of equipment will be used also in the deepest water zone, where using divers is unrealistic.

Both the Georgia and South Carolina teams will collect samples of certain fish. By removing the stomachs of these fish and analyzing the contents, biologists will gain a better understanding of the food chain upon which our major commercial and recreational fish species depend.

The study will demand a great deal of effort and care, and it will obviously require the cooperation of many people within the Coastal Resources Division. Vessels and divers must be ready to go at any time when the needs of the project dictate and sea conditions are suitable for diving operations. January is not an ideal month in which to conduct offshore dives, but the study schedule is tight and must be followed.



Before going offshore, CRD divers test new sampling techniques and equipment. The suction device shown here will collect corals, barnacles and other marine life from live bottom areas.

The contract from BLM is a hard-won prize for both South Carolina and Georgia. For months, officials from the South Atlantic States have insisted that they need more information about marine communities offshore before allowing the federal government to lease additional tracts of ocean floor to oil companies for energy exploration. Since the next lease sale is scheduled for September 1981, the pressure is on the states to obtain results from this study before that date.

Ultimately, the study goal is to place a value on the live bottom habitats in relation to the recreational and commercial fishery resources these habitats support. If resource managers and government officials have a better understanding of the conditions that affect these live bottom communities, they can make better decisions about the siting and operations of drilling rigs, pipeline corridors, and other petroleum exploration and production activities. Good decisions will help ensure that renewable and non-renewable resources exist compatibly on the Outer Continental Shelf.

--Jenny Phillips
Photos by Henry Ansley

Hunting Butler Island

Saturday morning, 5:00 a.m. -- Cold, windy and dark. Bring on the rain and conditions would be just perfect. Perfect? For a grizzly bear, eskimo or maybe Sasquatch, but no, not for any normal being. Unless that "normal" being happens to be a duck hunter.

Duck hunters will tell you themselves that they are a unique breed. The 50 to 60 hunters that gather at DNR's Butler Island Management Area in McIntosh County are no different.

They come as far as Marietta, Roswell, Decatur and Chamblee, and as near as Savannah, Statesboro, Brunswick and Darien. The hope for northwest winds, cold damp mornings, and generally harsh weather; any thing to drive the mallards, shovelers, ringnecks, green-wing teals and others southward from the Carolinas and other points along the Atlantic flyway; southward to

Georgia's coast and, hopefully, here to Butler Island.

Butler Island has been open for duck hunting since 1965, when organized hunts took place twice a week, on Wednesdays and Saturdays. The 30 blinds used today are in the same location as they were 15 years ago. The island was once a thriving rice plantation. Today however, its 1,000 acres of diked marshlands serve as a winter feeding site for canvasbacks, redheads, pintails, widgeon, scaups, mergansers, green and blue-wing teal, mallards, wood ducks and shovelers. The management area also contains some 180 acres across Highway 17 for refuge purposes. Most ducks tend to frequent this area shortly after Saturday morning's guns begin booming.

Subject to the weather, the past 14 years have been sometimes bad, sometimes good and sometimes better. By earlier indications, 1979



Numbers of wood ducks (shown at bottom of photo) and shovelers (shown at top) are often taken on a Saturday hunt at Butler Island. The most taken duck for the 1979-1980 season however, was the green-wing teal.

was supposed to have been one of the best years. However, the mild trend in temperatures has not yielded such expectations. After tallying 118 ducks during the first hunt on November 24, 1979, the last three weekends of the season have given up 22, 17 and 18 ducks respectively. Final totals show 382 hunters bagging 481 coot and ducks during this season's nine Saturday hunts.

Butler's 1,000 acres are divided into four quadrants: three flooded areas about one foot deep in water and one semi-dry snipe field. Each of the three flooded quadrants has ten blinds, comfortably housing two to three hunters.

Saturday's at Butler begin early. Decked in down, wool and waders, camouflaged men, women and children converge Butler's hunter check station as early as 4:30 a.m. Some bundle up and settle next to a supportive wall, others seek a close seat next to the room's gas heater. Most have pre-registered for this hunt months earlier. Others remain on a stand-by basis waiting for a "no-show" and a vacancy in one of the blinds. Butler Island's popularity stems from the facilities here and preparations that have been made in advance for each hunter.

At 5 a.m. the hunters begin milling about to take part in the drawing procedure assigning them to one of the 30 duck blinds.

DNR wildlife technician David Edwards checks for licenses, special Butler Island hunting permits and generally supervises the hunts. He is assisted by Jake Jones, Johnny Cuthbert, Ray Cookson and Willie Hutcherson.

Upon drawing for a blind, the groups then begin to load up on three wagons to venture into the cold and dark to one of the three quadrants where their blind is located. Each blind sits some 25 yards off the road in the water. A canoe and paddles wait at the roadside for each group. Edwards and his staff have already set out decoys. The rest is up to the hunter.

Shooting from one-half hour before sunup until 12 noon, hunters must observe a 25 shell limit and a five duck bag limit. Hunter success on Butler has ranged from 139 killed during the 1966-67 season to 622 shot during 1967-68. One year can make a lot of difference.

Duck hunters enjoy hunting on Butler



Biologist David Edwards removes gizzards from bagged ducks. The gizzards will later be examined for food intake and ingestion of lead shot.

Island because it is convenient, economical and enjoyable. Deadline for registering for the 1980-81 season hunts will be sometime in late September or early October. Information concerning the hunt is available from David Edwards, Butler Island Wildlife Management Area, Georgia DNR, Darien, GA. 31305.

Permits for the hunt may be applied for by mail beginning October 1, 1980. Applicants should apply to Game and Fish Division, Game Management, Sapelo Island, Georgia 31327.

--Steve Olsson

--Photos by the author

Tides On The Georgia Coast

Almost everyone has a concept of the tide. The periodic rise and fall of the tide is a familiar sight -- stranded boats, sunbathers moving chairs and blankets at the beach, and the tidal flooding of the coastal marshes. Knowledge of the tides is very beneficial for activities such as navigation, shoreline construction, boating and fishing.

High tide extends navigable waters allowing ships to pass safely and reach otherwise inaccessible areas. Low tide is still used to expose the hull of a shrimp boat for below waterline repairs on a 'poor man's railway' -- a convenient sand bar. The strong tidal currents accompanying the rise and fall of tides are important to navigation for harbor entrance and departure and for the transport of marine life forms (e.g., crab or shrimp larva) which cannot swim on their own and thus must use the currents for mobility.

Local shrimpers also depend on a good nor'easter and spring tides (they often occur together) to stir up the water and make it more turbid. George Y. "Jiggs" Redding of Valona says when the water is too clear, you can't catch shrimp because they see the nets coming.

Consideration of tides has always gone into building docks, bulkheads and other waterfront structures. Coastal construction increases as civilization crowds closer to the water's edge. Channel dredging, the deposition of dredge spoil, and bridge and pipeline construction all have to be designed with the changing tides in mind.

The tides help determine the rates of dilution, mixing and flushing of the coastal waters. As recently as ten years ago, municipal and industrial wastes were inadequately treated before discharge. The role of tidal circulation was poorly known and waste dilution by the tides was overemphasized. However, recent coastal studies have shown that many waste products are poorly mixed and simply make short tidal excursions, back and forth with each tide, causing pollution build-ups in certain parts of a harbor or tidal river.

In order to understand something of the tides, observations must be taken of the time

and the amount of tidal rise and fall each day over a long period. These observations are usually taken automatically at a tide gauge station by an instrument equipped with a float that rises and falls with the tide and makes a recording. The simplest way to measure the rise and fall of the tide is to erect a vertical pole, or TIDE STAFF, marked in feet like a large ruler, on the side of a dock piling -- then watch and record the hourly tide heights over a 25-hour period. If the observations are plotted on a graph in which the height of the tide in feet is numbered from top to bottom, the time in hours from left to right, the result would look something like that shown for a typical day in Savannah, Ga. Such a recorded tide curve is called a MARIGRAM. Note in Fig. 1 the times and heights of high and low tide change every day. You will note by study of Fig. 1 on the day chosen, the low water occurs at 7:00 a.m. and the next low tide at 7:30 p.m. This time of 12½ hours between one low water and the next is called a TIDAL PERIOD. Two tidal periods make a 25-hour day. For purposes of simplification whole, half and quarter hours are used, whereas in nature the time from one high tide to the next is normally 12 hours and 25 minutes. A complete tidal cycle or one lunar day is 24 hours and 50 minutes.

In the same way, one high water follows the previous high water by 12½ hours, the tide is observed almost an hour later each day. An explanation of this time lag lies in the schedule and phases of the moon. In the fishing villages along the Georgia coast, in order to fish the low water, families live by moon time -- a 25-hour day, or the approximate "one hour later each day" rule. Everyone else lives on sun time -- a 24-hour day. Thus the work habits of the two groups are out of sequence.

If you are a sport fisherman, or perhaps have stayed at the beach for two weeks or more, you may have noticed that at one time of the month high waters reached a higher level and low waters dropped lower than at other times. These instances are particularly obvious by the height and deposition of the marsh wrack and jetsam on the beach or by the exposure of sand

bars and mud flats.

Should you compare your observation of how one tide may vary from another with the phases of the moon, you would discover the tidal ranges are largest near the time when the moon is full, and also when the moon is new. (The RANGE is the difference between low water and high water.) When the moon is in its first or its third quarter the range is relatively smaller.

Tides are classified in three types: daily, mixed and semi-daily. We will discuss only the semi-daily type, having two high waters and two low waters per 25 hours with little difference between consecutive high and low water heights. The type of tides found in Georgia as well as all of those found along the east coast of the United States are the semi-daily kind. (Fig. 2)

Twice every month, at full and new ("no")

moon, the earth, moon and sun are in a straight line causing higher than usual tides. These are the SPRING TIDES that occur when the waters spring up (the term does not refer to the season of the year). (Fig. 3)

When the moon, sun and earth form a right angle (first and last quarters of the moon), the pulls oppose each other and the water height is nipped or lowered, resulting in NEAP TIDES. Variations in the neap range are not as obvious unless actual measurements are made. Fig. 4 shows a typical tide curve related to the phases of the moon for a 30-day period. You will note that small tidal ranges (neap tides) are followed after a week or so by large tidal ranges (spring tides) in a fairly smooth progression. Also note in Fig. 4 that successive tides (morning and evening) can be quite different in height.

Tides are waves. The two tidal bulges in Fig. 3 can be regarded as waves. Return again to

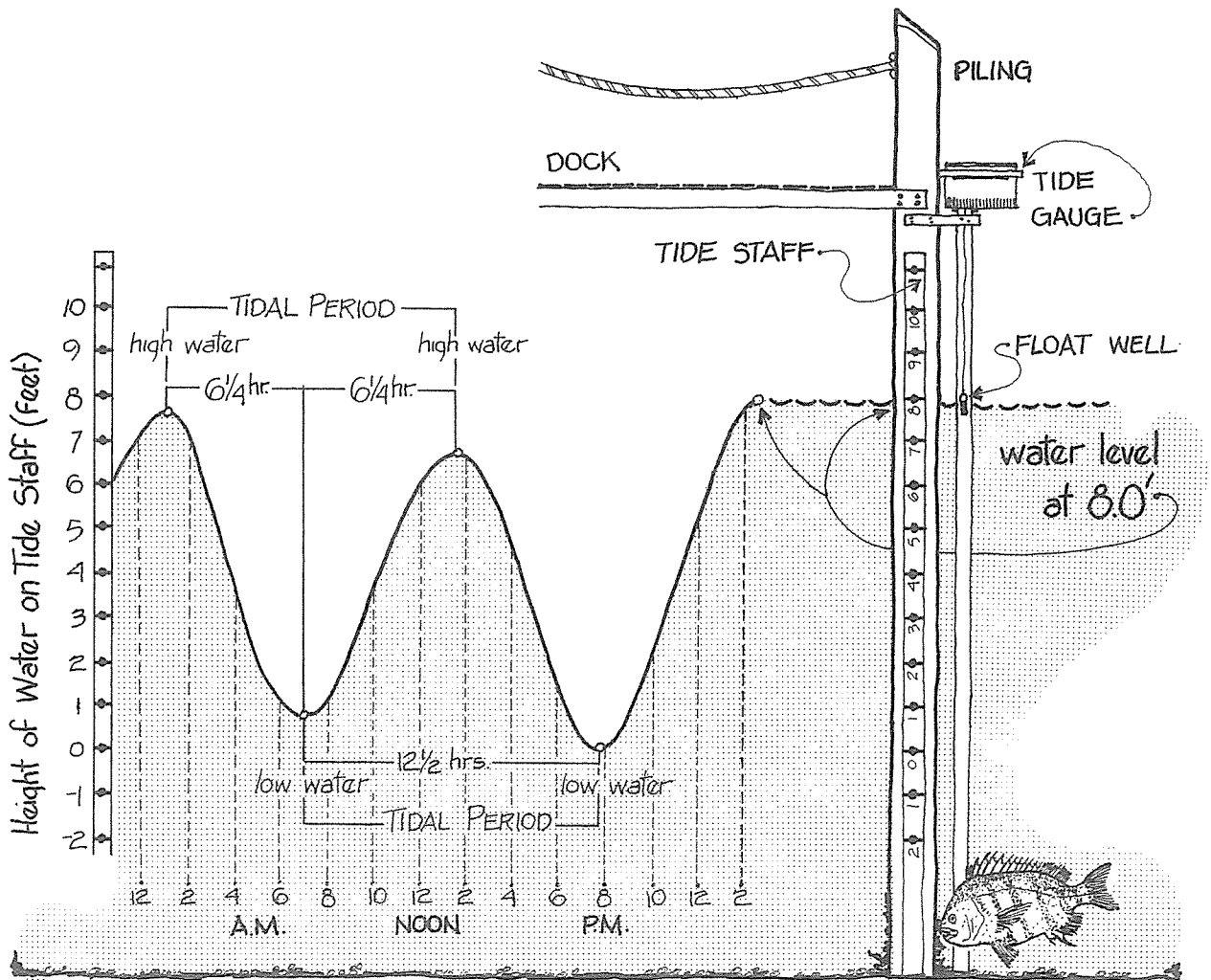


FIG. #1 TIDE CURVE FOR A TYPICAL DAY IN SAVANNAH, GEORGIA.

TIDES

TYPES & RANGES

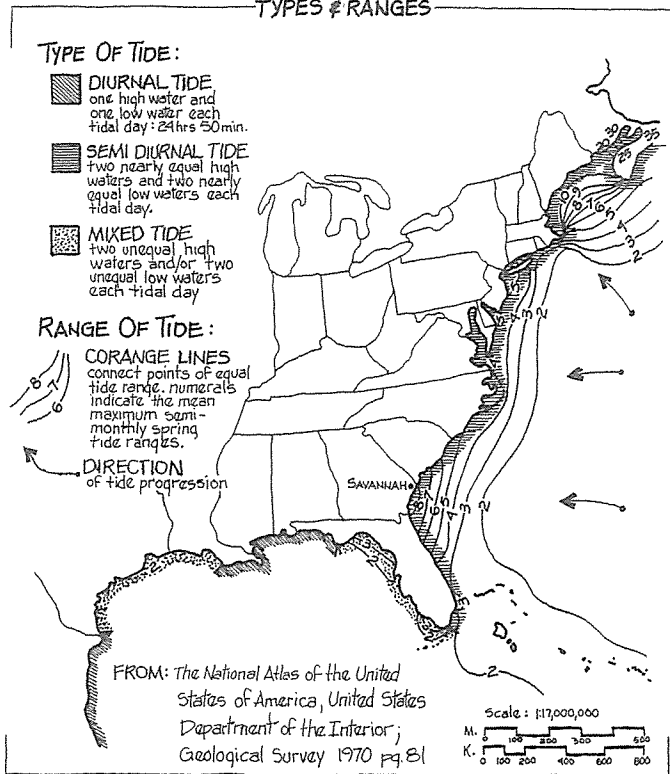


FIG. #2 TYPES & RANGES OF TIDES ALONG GULF AND ATLANTIC COAST OF UNITED STATES
NOTE: Twice each month the tides exceed 8' along the Georgia Coast.

Fig. 1 and interpret the tide curve as a wave form from 7 a.m. to 7:30 p.m. The highest point on a wave is called the CREST and the lowest, the TROUGH. A water wave is described by its HEIGHT (vertical distance from the trough to the crest), LENGTH (horizontal distance between crest), PERIOD (time interval between crest viewed from a fixed point).

According to oceanographer Steacy D. Hicks of National Ocean Survey (NOS), tidal waves are so long (in both length and period) that they are usually not recognized as waves. Actually at high tide we are merely observing the crest of a tidal wave and at low tide, the trough.

The height of the tide at its crest in Fig. 1 (about 1:30 p.m.) is nearly 7 feet, the preceding trough at 7 a.m. was just below one foot, the typical period is nearly 12 and one-half hours (7 a.m. to 7:30 p.m.), and the length -- about half the circumference of the earth -- some 12,600 miles.

Spring tides along the Georgia coast average in range from 8 to 9½ feet; neap tides range from 5 to 6 feet. After a number of recordings of the hourly variation in the height of the tide are collected over many months, certain characteristics of the tide can be discovered and predictions made for the future. The U.S. Dept. of Commerce, National Ocean Survey uses a computer to determine the many components (at least 37 cyclic variations in the sun-earth-moon system) to produce the tide tables. The computer program predicts a year of tides in three minutes, in a form ready for reproduction (refer to Tables 1 and 2.) These predictions give good estimates but are only for the astronomic tide. The actual water level can also be influenced by strong winds, unusual river runoff, or the barometric pressure.

Often the predicted tide differs from the actual tide. This is because the atmosphere and the sea are linked together, coupled in complex ways. Continuous strong west (offshore) winds tend to lower the water level. Persistent east (onshore) winds pile water up along the coast. Coastal flooding can result when onshore winds are added to the already high spring

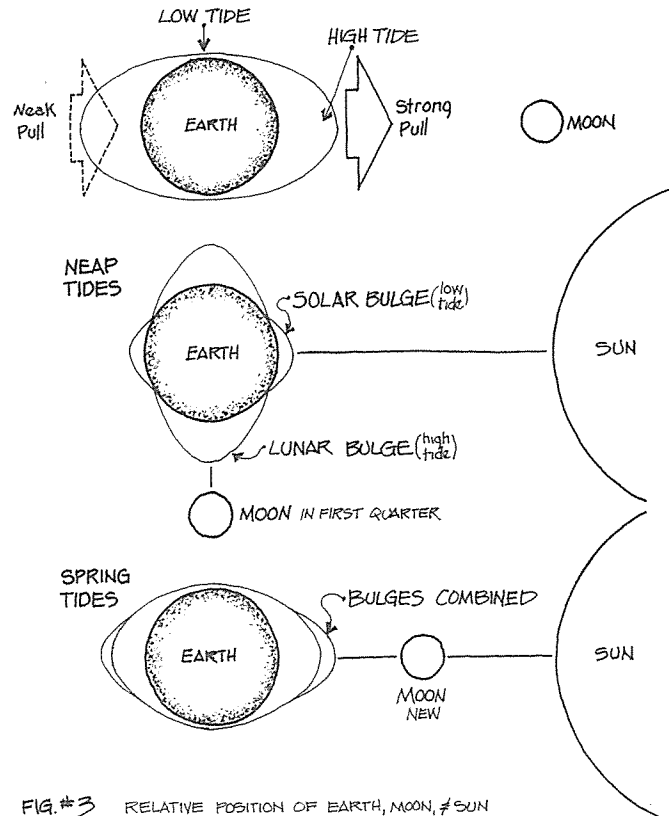
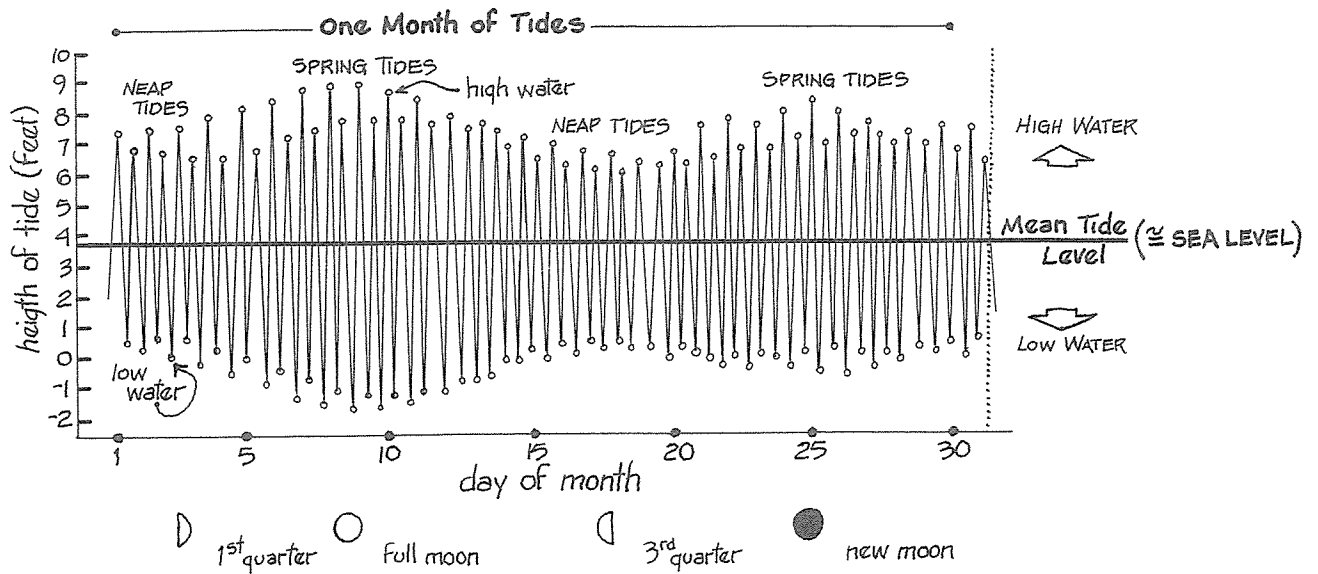


FIG. #3 RELATIVE POSITION OF EARTH, MOON, & SUN DURING NEAP TIDES & SPRING TIDES.



FIG#4: dots \circ on this graph represent successive high and low waters over a one month period. notice how the range varies from spring tides to neap tides. the graph represents a typical example for Savannah Ga. (after A.N. STRAHLER, 1966)

tides. Many shrimpers have indicated that often "a day or two after new or full moon the wind will back around out of the northeast, and blow foul and rainy." Ronister Johnson of Sapelo Island once explained this by saying "da tide carry de wind." Another bit of weather folklore on Sapelo is expressed as "it won't rain 'till the tide change" or the converse "it won't stop raining 'till the tide change." I have observed many times a change in wind speed and direction with a change in tide.

The oceans of air and water are more directly linked in other ways. As the atmospheric pressure rises during a "high", water level goes down; as atmospheric pressure diminishes, water level rises. In the latter case, most devastating of all is the eye of a hurricane whose barometric depression or "low" enhances the storm surge by producing a hump in the sea surface. The adjustment in ocean level in either direction is approximately one foot for each one inch change in barometric pressure.

Fig. 2 shows the broad sweeping crescent of the coast of the southeastern United States from Cape Hatteras to Cape Canaveral. Looking at this arc from the sea, Georgia appears to be situated at the upper end of a large, wide bay. This is favorable to the build-

up of the long period (12½ hours) tidal wave as it shoals up crossing the continental shelf. You will note that Georgia has the largest tidal range on the Atlantic seaboard south of Cape Cod. The funnel-shaped Bay of Fundy in the Gulf of Maine has tidal ranges exceeding 25 feet.

Detailed measurement of the tide is closely related to sea-level fluctuations. The agency responsible for such studies is the National Ocean Survey (NOS), formerly the Coast and Geodetic Survey. The Survey, commissioned by President Thomas Jefferson, is the oldest scientific agency of the United States Government. On the Atlantic Coast over the last 40 years, data from 44 tide gauges have shown a rise of sea level. The NOS has pinpointed recent sea risings. Since 1940 the sea has risen seven inches in Savannah. It has shown that from Florida to Massachusetts the coastline is sinking at the rate of several millimeters per year or nearly a foot in this century. While changes in the elevation of coasts are very slow, the effects of this small rise are important in areas of beach erosion, shore boundaries, mapping, etc.

There are several ways the sea encroaches on the coast. An absolute change in sea level can be brought about by a change in volume of the

ocean basins, excess melting or freezing of the polar ice caps, or by a change in the temperature of the oceans. On the other hand, land itself may be subsiding due to ground water withdrawal.

Usually it is impossible to distinguish between submergence of the coast and rising sea level because the only measurable quantity is the relative position of land and sea. Over short periods, several hundred years, the change in level is usually due to local land movements. But over longer periods, tens of thousands of years, the changes mount up so they can be measured.

Based on the work of Dr. Jim Henry and the late Dr. John Hoyt we can find barrier island beaches more than 40 miles inland and 100 feet above the present sea level. They identified six major shorelines of the past. The period in which Georgia's Coast was formed is called the Pleistocene Epoch, or the "Great Ice Age."

Slowly and in subtle ways, Georgia's tides constantly affect our lives and our environment. They are in part responsible for shaping and forming the coast. Their influence will always be with us.

--Frederick C. Marland, Ph.D.
Illustrated by Frederick P. Pariani

For More Information . . .

You are invited to read the following books. The first two are good for beginners and young people.

Brindze, Ruth, 1964; **The Rise and Fall of the Seas; the Story of the Tides.** 96 p., Harcourt, Brace and World, N.Y.

National Ocean Survey, 1975; **Tide and Current Glossary,** 25 p., 75c, Superintendent of Documents, U.S. Govt. Printing Office, Washington, D.C. 20402.

Clemons, Elizabeth, 1967; **Waves, Tides and Currents,** 112 p., Knopf, N.Y.

National Ocean Survey, 1975; **Our Restless Tides,** 24 p. (35c), Superintendent of Documents, U.S. Govt. Printing Office, Washington, D.C. 20402.

Clancey, Edward P., 1969; **The Tides: Pulse of the Earth,** 228 p. (556; \$1.95), Anchor Books (paperback), Garden City, N.Y.

Strahler, Arthur N., 1971; **The Earth Sciences, Second Edition, Chapter 9 - The Tide,** Harper and Row Publishers, N.Y.

Wylie, Francis E., 1979; **Tides and the Pull of the Moon,** 246 p., The Stephen Greene Press, Battleboro, Vermont.



Environmental specialist Jerry Knowlton samples vegetation and soil for traces of radioactive materials.

EPD Radiation Sampling

Those of you who have been traveling in Camden County in recent months may have noticed small black plastic bags clipped to trees or power poles near the highways. These small bags, as inconspicuous as they seem, are thermo-luminescent dosimeters (TLD's) an important part of the Georgia Environmental Protection Division's radiation surveillance program. This program has been recently expanded as a result of the opening of the Kings Bay submarine base. The TLD's consist of radiation-trapping crystals affixed to tapes and sealed in the plastic bags. These crystals, which are also sensitive to ultraviolet rays from the sun, register high energy (gamma) radiation they have trapped when they are heated, thus the name thermo-luminescent.

In addition to collecting the TLD's, Jerry Knowlton of the Brunswick region office, will be responsible for taking direct radiation readings and collecting quarterly samples of surface and groundwater, vegetation, and soil from specified stations. Fish, animals, fruits and vegetables will also be collected when possible. These samples will be analyzed for the presence of natural background radiation and man-made radioactive materials measured as gross alpha and beta particles.

A similar radiation surveillance program has been established around the Edwin I. Hatch Nuclear Power Plant in Baxley and is attended by E. Merrill Tindall also of the Brunswick regional EPD office.

--Carol Robinson

What's Cooking On The Georgia Coast?

ROCK SHRIMP SALAD

1 pound boiled rock shrimp
(peeled and deveined)
2 fresh tomatoes
½ bell pepper
1 onion
½ fresh lime juice
1 tablespoon olive oil
1 tablespoon wine vinegar
½ teaspoon crushed red pepper
Salt and black pepper to taste

Cut up each rock shrimp into 2-3 pieces. Dice tomatoes, bell pepper and onion. Add to shrimp. Add lime juice, olive oil, wine vinegar, crushed pepper, salt and black pepper to shrimp mixture. Stir and place in refrigerator 4 to 5 hours to season.

--Virginia Baisden

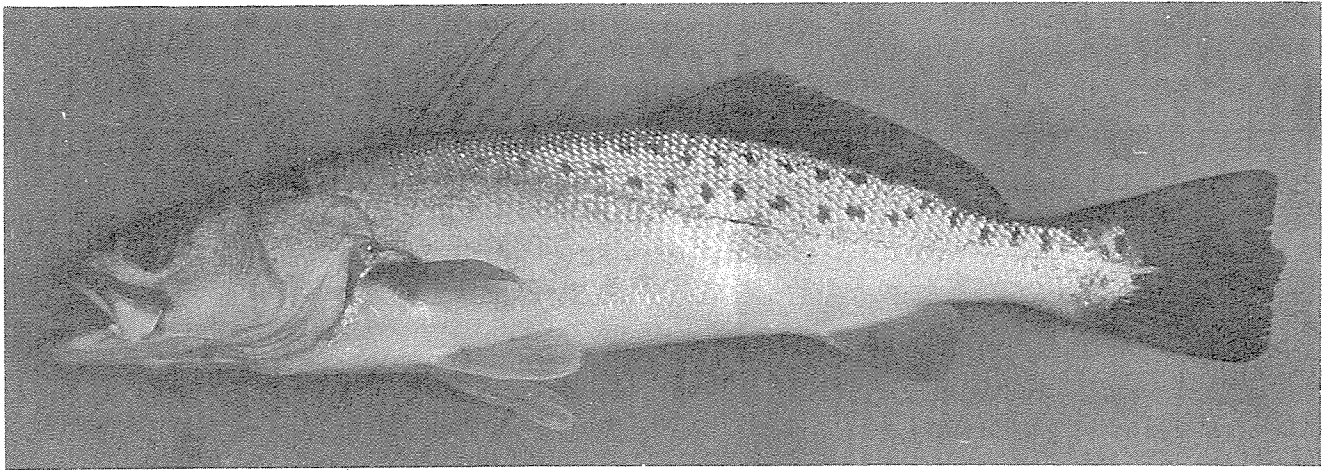
Review of New Report

The report, "Development of Fishery Management Plans for Selected Anadromous Fishes in South Carolina and Georgia," is available for free distribution at the CRD library.

This report covers the following species: The American shad, *Alosa sapidissima*; hickory shad, *Alosa mediocris*; blueback herring, *Alosa aestivalis*; and the striped bass, *Morone saxatilis*. Life history information was summarized for each species and provides as accurate an assessment of stock status and fisheries conditions as available information permitted. Major emphasis was placed on obtaining information on existing conditions in the fisheries from fishermen, their opinions on the present management system and the perceived needs for changes in management practices.

This report and others are available by contacting the CRD library at 1200 Glynn Ave., Brunswick, Georgia, phone 912-264-7330.

--Eleanor Y. Waters



Going For Spotted Sea Trout

The Spotted Sea Trout (*Cynoscion nebulosus*) is one of the most popular inshore saltwater game and food fishes in Georgia's coastal waters. Its flesh is light and delicately flavored and ranks very high as a table fish. Also known as the spotted weakfish or trout, the spotted sea trout occurs throughout the Gulf of Mexico, in Florida waters, and north to New York.

Shrimp are the preferred food of the spotted sea trout, and when these crustaceans are in abundance, trout feed on them almost exclusively. Although live shrimp are the most commonly used bait, trout are widely caught on artificial lures as well. Artificial lures are very good from November through March in upper creeks and rivers with moderate to low salinities.

The following tips may aid the average fisherman in his quest for the spotted seatrout:

TACKLE

Use light spinning or spin cast reels with approximately 6' rods. The lighter the line the easier it is to cast and/or troll (12 lb. test or lighter).

TROLLING OR CASTING

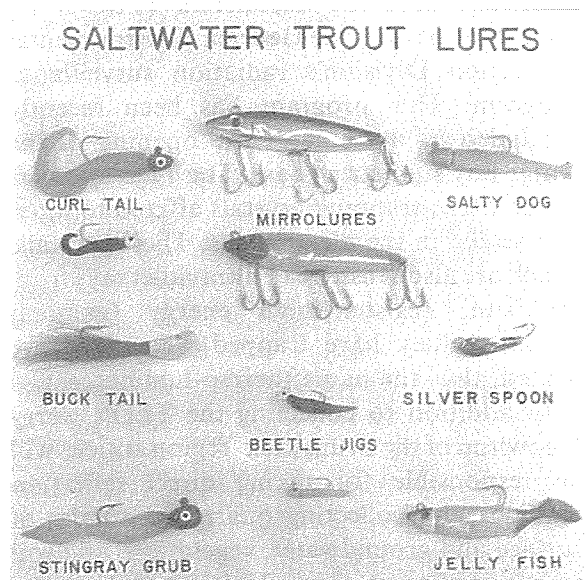
Troll or retrieve lure as slow as possible allowing lure to occasionally strike the bottom.

AREAS

The spotted sea trout is basically a schooling fish and concentrations are likely to be found in areas of hard bottoms of sand and shell especially in areas with a lot of dead white shell or oyster beds.

LURES

As illustrated, a variety of trout lines are available. Since local water conditions may vary from one area to another, the average trout fishermen will find it beneficial to have a wide selection of lures.



FISHING HINTS

- (1) Dark solid colored lures are recommended in dark and muddy waters.
- (2) Light colors in clear water.
- (3) A very good choice is the green with fluorescent tail stingray with the ¼ oz. head.
- (4) When the trout are running small you can catch them on the ⅛ oz. miniature grubs or either the small white and yellow bucktails, commonly called shad jigs.
- (5) Get more lure action if a loop is tied

rather than using a swivel. However, most people like to use a swivel for quick lure change.

(6) Now is the time to go with artificials, so wet a hook.

(7) Fish it slow.

--Jim Music, John Pafford



Ossabaw Opens To Public Hunting

The first three public deer hunts in the history of Ossabaw Island were managed by the Department of Natural Resources during the 1979-80 hunting season. All three were quota hunts with 75 permits issued for each. The first two were parent-child firearm hunts and the final hunt was an all-adult firearm hunt.

During the first three-day hunt, 29 hunters killed 26 deer, an 89.7% success rate. Of the deer brought in, 21 were bucks, the largest weighing 108 pounds and carrying an 8 point rack. The second hunt brought 32 young hunters who shot 28 deer. This time 18 bucks were shot, the largest weighing 99 pounds. The largest rack, 9 points, was on an 86 pound buck shot by the youngest and also a first-time hunter, Kevin Griffin. Fifty-eight adults showed up for the third hunt and a total of 50 deer were killed.

In the three managed hunts, 119 hunters killed 104 deer, a success rate of 87.4%. This is an unprecedented state record of any managed deer hunt.

Things were hectic on Ossabaw for some time prior to the first hunt. In fact, the sounds of construction were just waning when the first hunters arrived Thanksgiving weekend. The docks were completed for those who chose to bring their own boats. Bob Bacot of the Kilkenny Fish Camp provided an excellent service, bringing most of the out-of-town hunters to Ossabaw. The shower house wasn't quite ready for use the first hunt day, but the outhouse was an adequate substitute, and the kids were rather amused by it.

Only about half of Ossabaw's acreage was opened to hunting, approximately six square miles on the southern end of the island. For about a year, the Ossabaw staff has been busy developing a population estimate using trackcount data. The estimate has been determined to be somewhere around 4,000 deer, or 194 deer per square mile. These figures seem quite incredible, but the success of the hunts lends credence to the estimate. There



Kevin Griffin poses with his mother, Martha, next to his nine-point buck, the largest of the hunt. Kevin was the youngest of many successful hunters in this year's three Ossabaw hunts.

were approximately 17 deer per square mile killed during the 3 hunts, a total of 9 hunting days. This is the highest harvest per square mile known for Georgia.

After the hunt, youngsters answered a questionnaire which provided some general information on their reactions to the hunt. Out of 30 questioned, half were in the 15-year-old age group. Five out of 30 were on their first hunt. These five all got a deer, four of which were bucks. These youngsters were clearly excited about being on Ossabaw and observing the large numbers of deer and assorted wildlife. They all enjoyed their stay on Ossabaw, and there were only a few complaints of "missing a big buck."

Overall, we had three terrific groups of people to visit Ossabaw. We heard deer-hunting stories that were age-old, a few that were new, some that weren't deer-hunting stories at all, and chronicled a few of our own. We were so proud of the "Twinkie Kid," when we found him standing on the side of the road with his dad and a big buck. "Twink" was sitting up in his tree stand, eating breakfast one morning -- a Twinkie, of course, -- when all of a

sudden, the biggest buck you've ever seen strolled by munching on mistletoe. Well, "Twinkie" got so excited he grabbed his gun, dropped his Twinkie right out of the tree and missed that big ole buck. After that we had to add rule #6 to the bottom of the list: "No Twinkies allowed in the woods."

A group of eight hunters from Alpharetta came to the adult hunt. They were the first ones to arrive Wednesday morning with enough gear to take care of an army. And that's just what they did. Buffalo, the chief cook and story teller fed our staff some of the best barbecue we had ever eaten. (He also fed us alot of Buffalo Bull, but everyone loved it, time and time again). They spent one afternoon cutting enough firewood to get us through next year's hunts. King Stracke, the organizer of the trip, kept us on our toes right up to the last minute when he finally brought in a buck Saturday evening, making 100% success for that bunch. And what a proud bunch of comrades they were!

Noel Holcomb, Ossabaw's refuge manager was responsible for overall management of the hunt. This included getting the hunters out and



Wildlife Biologist Jerry McCollum field dresses a deer. Together with volunteer students and other biologists, Ossabaw's management team collects measurements of heart sizes and reproductive tracts, live and dressed weights, and rack size.



Wildlife Management students from Abraham Baldwin Agricultural College help determine the age, growth and overall health of Ossabaw's deer population. Here they remove one deer's jawbone to determine its age.

on to their stands, and making sure they were all properly oriented. He conducted hunter safety instruction and provided special assistance including emergency medical plans and evacuation.

Michael Sellers, a DNR Ossabaw mechanic, maintained the generator for operating the cooler as well as providing logistical support from the North End of the island and keeping daily routine operations in order.

Research assistant, Terry Holcomb, was responsible for collection of track-count data and hunt data (ie. taking reproductive tracts and jawbones for aging.)

Biologist Carroll Allen from the Atlanta Game Management Office provided invaluable assistance and tons of moral support. Conservation Ranger Terry "Grits" Haas provided Law Enforcement during all three hunts. Five students from Abraham Baldwin Agricultural College and a Young Adult Conservation Corps worker, Scott

Armstrong, assisted with collection of data as well as maintenance and construction around the hunt camp. Conservation Ranger Talmadge "Smitty" Hughes, assisted during the third hunt. Smitty and his son, Earl Futch, were successful participants in the first parent-child hunt.

Biologist Jerry McCollum is responsible for the overall management of the island, including supervision of all research, recommendation of hunting regulations and other administrative activities.

In spite of the remarkable success of the hunts from the viewpoint of the hunters, Wildlife Biologist McCollum said that "the goals of the hunts were not realized from the viewpoint of wildlife management." One intent of the harvest was to reduce the number of deer so that the deer herd would improve. McCollum said that "many more deer would have to be removed and a greater proportion would have to be does if a population reduction is to be accomplished."

--Terry Holcomb

--Photos by Michael I. Sellers

Next In Coastlines . . .

--An Island Away: Little St. Simons



--Ebenezer Creek: A Backwater Experience



--Offshore Oil Activities

Coastlines Georgia . . .

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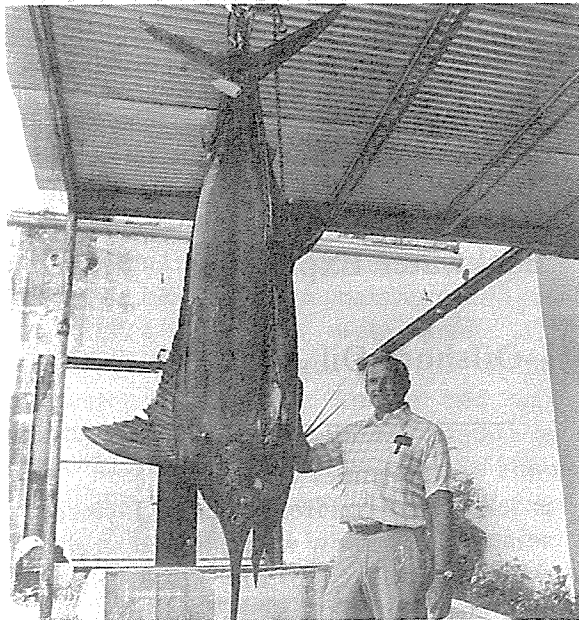
Georgia Saltwater Gamefish Records

If you've been waiting for some incentive to get yourself out on Georgia's coastal waters with a rod and reel in hand, then possibly this is it.

The Georgia Saltwater Gamefish Records Program enables men and women to establish records in 47 different species categories. The program, begun in 1972, has been somewhat passive in recent years. CRD staff is hoping that renewed enthusiasm among record program officials and participants will again make it an active, exciting program.

The new rules (see p. 00) will adhere closely to International Gamefish Association regulations. Some modifications have been included to better suit the needs of Georgia saltwater fishermen. Anglers are urged to read the new rules completely and carefully as they are much more extensive than previous guidelines.

The new program will also include a women's category for all species. Immediately, this provides a wide open field for many species where no record has yet been established. A newly designed certificate will accompany a letter of congratulations to all previous and present record holders within the near future. The certificate, designed by Rick Pariani, exhibits the wide variety of sportfish found off Georgia's coast.



Harold Murray with his 361-pound blue marlin caught in the Gulf Stream off Savannah in May, 1975.



A 133-pound grouper caught by Michael Duncan of St. Simons Island in March of 1979.

Angling regulations cannot insure an outstanding performance from each fish and records cannot indicate the amount of difficulty involved in catching the fish. Captures in which the fish has not fought or has not had a chance to fight do not reflect credit on the fisherman, and only the angler can properly evaluate the degree of achievement in establishing the record.

For information on the program, contact Henry Ansley, Ann Cullens or Steve Olsson at CRD headquarters. We welcome your questions and comments.



Wright Parker with the latest addition to the Saltwater Records, a 23-pound tripletail caught July 7, 1979.

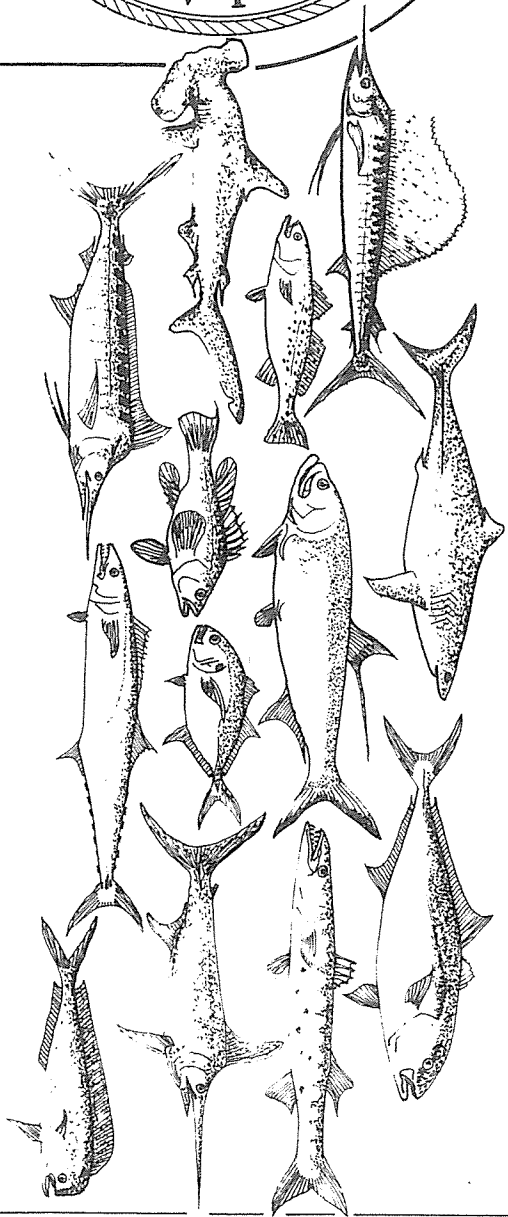
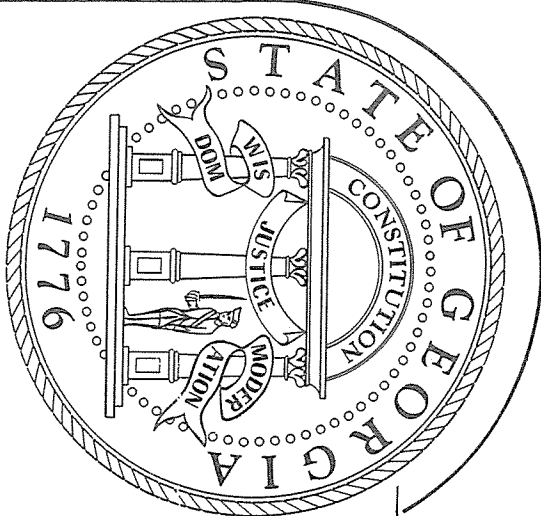
Saltwater Gamefish Records

SPECIES	ANGLER	WEIGHT	LENGTH	LOCATION	DATE
Amberjack (greater)	Ben W. Key, Jr.	92 lb. 1 oz.	6' 1/2"	Reef J. - St. Catherines	6/75
Barracuda (great)	H. Lewis Hazel	41 lb. 12 oz.	58' 1/2"	Texas Tower, Savannah	9/75
Bass (black sea)	Dr. Andy Lawrence	4 lb. 8 oz.	18"	Tampa Reef	3/77
Bluefish	Allen Woods	14 lb. 1 oz.	32"	"G" Buoy	3/76
Cobia	Hubert Fender	70 lb. 8 oz.	5' 6"	Wassaw Sea Buoy	5/79
Croaker (Atlantic)	David Flynt	5 lb. 12 oz.	22' 1/2"	Lanier Bridge, Brunswick	3/77
Dolphin	Romona Arsenault	54 lb. 8 oz.	5' 2 1/2"	66 miles of W-2 Wassaw	7/76
Drum (black)	Myrtie Welborn	70 lb.	4'	N. Newport River	7/75
Drum (red) (Channel Bass)	J. D. Long	45 lb.	-----	Darien, Georgia	0/69
Flounder (species composite)	R. S. Monroe, III	11 lb. 11 oz.	28"	Christmas Creek, Brunswick	8/79
Grouper (species composite)	Michael Gerald Duncan	133 lb.	59"	-----	3/79
Jack (crevalle)	Marcus Wagner	35 lb.	46"	Tybee Roads Savannah River Channel	7/77
Ladyfish	Marjorie Nightbert	5 lb.	-----	3 miles north of the north Fernandina Beach - 150 yds. off Cumberland Island	8/78
Mackerel (King)	Talmadge Griffis	46 lb. 4 oz.	5' 2 1/2"	Sapelo Live Bottom	6/77
Mackerel (Spanish)	John V. McCranie	7 lb. 2 oz.	30"	"STS"	6/75
Marlin (blue)	Harold Murray	361 lb.	133 1/4"	Gulf Stream, Savannah	5/75
Marlin (white)	Joe Fraser	35 lb.	60 3/4"	Gulf Stream, Savannah	5/76
Sailfish	Leopold Alder, II	51 lb. 8 oz.	-----	Wassaw Sea Buoy	8/73
Sea Trout (spotted)	Tommy Hall	9 lb. 7 oz.	30' 1/2"	Christmas Creek	7/78
Shark (blacktip)	Albert L. Boyd	131 lb.	7' 7 1/2"	In Wassaw Sound at #13 can	5/78
Shark (bull)	L. B. Kennedy	450 lb.	9' 6 1/4"	St. Andrews Sound	7/74
Shark (dusky)	F. E. Miles, Jr.	168 lb.	7' 2"	Odingsell Creek	5/78
	David Reddick (prev. record)	167 lb.	5' 7"	Odingsell Creek	5/78

SALTWATER SPORTFISH RECORDS (Cont.)

SPECIES	ANGLER	WEIGHT	LENGTH	LOCATION	DATE
Shark (hammerhead) (species composite)	Charlie Marshall	770 lb.	13' 3"	Little Cumberland Island Brunswick	8/73
Shark (lemon)	Thomas Winslow	375 lb.	9' 4"	St. Andrews Sound	7/74
Shark (mako)	Harry Wooley	228 lb. 8 oz.	8' 11 1/2"	Gulf Stream, Savannah	5/75
Shark (sandbar)	Chet Lee Kirby	158 1/2 lb.	7' 5 1/2"	Jekyll Pier	5/79
Shark (sand tiger)	Billy Castle	290 lb.	9' 6"	Ossabaw Sound	5/77
Shark (thesher)	Mark Noble	116 lb.	9' 5 1/2"	"WR 2"	3/76
Shark (tiger)	Chuck Hall	794 lb.	12' 8"	(STS) St. Simons	8/75
Sheepshead	Danny Sapp	13 lb. 3 oz.	2' 2"	Pikings Getties, STS	3/77
Snappers (species composite)	Carl Sanmons Ed Farrell (prev. record)	36 lb. 28 lb.	38" 40"	Sapelo Sound WR2	6/79
Snook	William Music	6 lb. 1 oz.	2' 2 1/8"	Turtle River	2/76
Spadefish	Mike Evans	6 lb. 15 oz.	-----	Buoy "R 2B", Brunswick	4/74
Spot					
Swordfish	Woody Woodward	61 lb. 6 oz.	6' 10 1/2"	Gulf Stream	6/79
Tarpon	C. Robert West	137 lb. 8 oz.	-----	St. Simons Island	0/69
Tuna (big eye)					
Tuna (blackfin)	W. H. Bachus	21 lb. 4 oz.	2' 9"	Tampa Reef	5/75
Tuna (bluefin)					
Tuna (yellow fin)	Anne Smith	165 lb. 4 oz.	-----	Wassaw Sea Buoy	5/73
Tuna (little)	Sister Mary Clarice	20 lb.	-----	W2 Buoy	7/73
Wahoo	Tom Pardue	81 lb. 12 oz.	5' 10"	Savannah Gulf Stream	9/74
Whiting (species composite)	Harold G. Guinn	2 lb. 12 oz.	18"	McKay River	2/75
Triggerfish (grey)	Sam Collins	7 lb. 3 oz.	2' 2"	Savannah Snapper Banks	7/76
Summer Trout	Frank Taylor	6 lb. 8 oz.	26"	Troupe Creek	3/76
Greenland Shark (nurse shark)	A. E. Potter	65 lb. 4 oz.	6' 2"	St. Andrews Sound	6/77
Tripletail	Wright Parker Henry Cate (prev. record)	23 lb. 18 lb. 3 oz.	2' 3 1/2"	Satilla Cove Marker - Cumberland River	7/79 7/77

State of Georgia Saltwater Gamefish Record



holds the

for a

GOVERNOR State of Georgia

COMMISSIONER Department of Natural Resources

DIRECTOR Coastal Resources Division

Lbs. _____

Oz. _____

Kgs. _____

Gr. _____

Date: _____

GEORGIA SALTWATER GAMEFISH RECORDS ANGLING RULES

A. LINE

1. Monofilament, multifilament, and lead core multifilament lines may be used.
2. Wire lines are prohibited.

B. DOUBLE LINE

The use of a double line is not required. If one is used, it must meet the following specifications.

1. A double line must consist of the actual line used to catch the fish.
2. The double line on all weights of tackle up to and including the 24 kg (50 lb.) line class shall be limited to 15 feet (4.6 meters). For heavier tackle, the line shall not be doubled for more than 30 feet (9.2 meters). Double lines are measured from the start of the knot, braid, roll or splice making the double, to the farthestmost end of the knot, splice, snap, swivel, or other device used for securing the trace, leader, lure or hook to the double line.
3. The double line must not be lengthened beyond the stated limitations to compensate for a leader shorter than the maximum length allowed.
4. The double line must be connected to the leader, if one is used, with a knot, splice, snap, swivel, or other device.

C. LEADER

The use of a leader is not required. If one is used, it must meet the following specifications:

1. The leader on all weights of tackle up to and including the 24 kg. (50 lb.) line class shall be limited to 15 feet (4.6 meters). For heavier tackle the leader shall not exceed 30 feet (9.2 meters). There are no minimum lengths. The length of the leader is the overall length including any lure, hook arrangement or other device.
2. The leader may not be lengthened beyond the stated limitations to compensate for a double line shorter than the maximum length allowed.
3. The leader must be connected to the line with a knot, splice, snap, swivel, or other device.
4. There are no regulations regarding the material or strength of the leader.

D. ROD

Rods must comply with sporting ethics and customs. Considerable latitude is allowed in the choice of a rod, but rods giving the angler an unfair advantage will be disqualified. This rule is intended to eliminate the use of unconventional rods.

E. REEL

1. Reels must comply with sporting ethics and customs.
2. Power driven reels of any kind are prohibited. This includes motor, hydraulic, or electrically driven reels, and any device which gives the angler an unfair advantage.
3. Ratchet handle reels are prohibited.
4. Reels designed to be cranked with both hands at the same time are prohibited.

F. HOOKS FOR BAIT FISHING

1. For live or dead bait fishing no more than one treble hook or two single hooks may be used. The hooks must be firmly imbedded in or securely attached to the bait. The eyes of the hooks must be no less than a hook's length (the length of the largest hook used) apart and no more than 18 inches (45 cm) apart. The only exception is that the point of one

hook may be passed through the eye of the other hook.

2. The use of a dangling or swinging hook is prohibited.
3. A two-hook rig for bottom fishing is acceptable if it consists of two single hooks on separate leaders or drops. Both hooks must be imbedded in the respective baits and separated sufficiently so that a fish caught on one hook cannot be foul-hooked by the other.
4. All record applications made for fish caught on two-hook tackle must be accompanied by a photograph or sketch of the hook arrangement.

G. HOOKS AND LURES

1. When using an artificial lure with a skirt of trailing material, no more than two single hooks may be attached to the line, leader or trace. The hooks need not be attached separately. The eyes of the hooks must be no less than an overall hook's length (the overall length of the largest hook used) apart and no further than 12 inches (30 cm) apart. The only exception is that the point of one hook may be passed through the eye of the other hook. The trailing hook may not extend more than a hook's length beyond the skirt of the lure. A photograph or sketch showing the hook arrangement must accompany a record application.

2. Gang hooks are permitted when attached to plugs and other artificial lures that are specifically designed for this use. Gang hooks shall be limited to a maximum to two hooks (either single, double, or treble, or a combination of any two.) These hooks must be permanently and directly attached to the lure and must be free swinging. A photograph or sketch of the plug or lure must be submitted with record applications. If not satisfactory, the plug or lure itself may be requested.

H. OTHER EQUIPMENT

1. Fighting chairs may not have any mechanically propelled devices which aid the angler in fighting a fish.
2. Gimbals must be free swinging, which includes gimbals that swing in a vertical plane only. Any gimbal that allows the angler to reduce strain or to rest while fighting the fish is prohibited.
3. Gaffs and nets used to boat or land a fish must not exceed 8 feet (2.5 meters) in overall length. (When fishing from a bridge, pier, or other high platform or structure, this length limitation does not apply). In using a flying or detachable gaff, the rope may not exceed 30 feet (9.2 meters). The gaff rope must be measured from the point where it is secured to the detachable head to the other end. Only the effective length will be considered. If a fixed head gaff is used, the same limitations shall apply and the gaff rope shall be measured from the same location on the gaff hook. Only a single hook is permitted on any gaff. Harpoon or lance attachments are prohibited.
4. Floats are prohibited with the exception of any small flotation device attached to the line or leader for the sole purpose of regulating the depth of the bait. The flotation device must not in any way hamper the fighting ability of the fish.
5. Entangling devices, either with or without a hook, are prohibited and may not be used for any purpose including baiting, hooking, fighting, or landing the fish.
6. Outriggers, downriggers, and kites are permitted to be used provided that the actual fishing line is attached to the snap or other release device, either directly or with some other material. The leader or double line may not be connected to the release mechanism either directly or with the use of a connecting device.
7. A safety line may be attached to the rod provided that it does not in any way assist the angler in fighting the fish.

ANGLING REGULATIONS

1. From the time that a fish strikes or takes a bait or lure, the angler must hook, fight, and bring the fish to gaff without the aid of any other person, except as provided in these regulations.

2. If a rod holder is used and a fish strikes or takes the bait or lure, the angler must remove the rod from the holder as quickly as possible. The intent of this rule is that the angler shall strike and hook the fish.

3. In the event of a multiple strike on separate lines being fished by a single angler, only the first fish fought by the angler will be considered for a record.

4. A harness may be attached to the reel or rod, but not to the fighting chair. The harness may be replaced or adjusted by a person other than the angler.

5. Use of rod belt or waist gimbal is permitted.

6. When angling from a boat, once the leader is brought within the grasp of the mate, or the end of the leader is wound to the rod tip, more than one person is permitted to hold the leader.

7. One or more gaffers may be used in addition to persons holding the leader. The gaff handle must be in hand when the fish is gaffed.

THE FOLLOWING ACTS WILL DISQUALIFY A CATCH.

1. Failure to comply with equipment or angling regulations.

2. The act of persons other than the angler in touching any part of the rod, reel or line (including the double line) either bodily or with any device during the playing of the fish, or in giving any aid other than that allowed in the rules and regulations. If an obstacle to the passage of the line through the rod guides has to be removed from the line, then the obstacle (whether chum, floatline, rubber band, or other material) shall be held and cut free. Under no circumstances should the line be held or touched by anyone other than the angler during this process.

3. Resting the rod in a rod holder, on the gunwhale of the boat, or on any other object while playing the fish.

4. Handling or using a handline or rope attached in any manner to the angler's line or leader for the purpose of holding or lifting the fish.

5. Shooting, harpooning, or lancing the fish being played (including sharks) during any stage of the catch.

6. Chumming with or using as bait the flesh, blood, skin, or any part of mammals other than hair or pork rind used in lures designed for trolling or casting.

7. Beaching or driving into shallow water any fish hooked from a boat in order to deprive the fish of its normal ability to swim.

8. Changing the rod or reel while the fish is being played.

9. Splicing, removing, or adding to the line while the fish is being played.

10. Intentionally foul-hooking a fish.

11. Catching a fish in a manner that the double line never leaves the rod tip.

THE FOLLOWING SITUATIONS WILL DISQUALIFY A CATCH:

1. When a rod breaks in a manner that reduces the length of the tip below minimum dimensions or severely impairs its angling characteristics.

2. Mutilations to the fish caused by sharks, other fish, mammals or propellers that remove or penetrate the flesh. (Injuries caused by leader or line, scratches, old healed scars or regeneration deformities are not considered to be disqualifying injuries). Any mutilation on the fish must be fully explained in a separate report accompanying the

record application.

3. When a fish is hooked on more than one line.

4. If the fish is landed by a DNR employee while aboard a DNR vessel.

GEORGIA SALTWATER GAMEFISH REQUIREMENTS

Gamefish catches only qualify for Georgia saltwater gamefish record status if they are caught according to Georgia saltwater gamefish angling rules. Following is information on saltwater record categories, requirements, and procedures for filing claims, effective January 1, 1980.

Georgia Saltwater Gamefish Record Categories

The Coastal Resources Division (CRD) of the Georgia Department of Natural Resources (DNR) maintains men's and women's records for eight categories of saltwater game fishes. In order to be eligible for a Georgia saltwater record, a fish must be caught according to Georgia Saltwater Gamefish Records angling rules. Any fish entered as a saltwater gamefish record must have been hooked in Georgia state waters or in waters offshore the Georgia Coast. No applications will be accepted for fish caught in private waters or controlled private bodies of water. In order to qualify for a record, a catch must outweigh the existing record by the required amount. Announcement of additional saltwater gamefish species selected for inclusion in the program in **Coastlines** or in other DNR publications will be considered proper identification in lieu of any other notice.

Revision/Evaluation

The Georgia Saltwater Gamefish Records program will be re-evaluated biennially by the Saltwater Gamefish Records Committee, which shall be composed of the Director, the Public Services Section Chief, and the Chief of Coastal Fisheries Section of the Coastal Resources Division. All decisions regarding rule changes made by this committee are considered final.

Outstanding Catch

Fish not included in the records categories that were landed in accordance with angling ethics and rules may be considered by the Saltwater Records Committee for recognition as an Outstanding Catch. Upon approval, catches such as these will receive appropriate certification and will be filed for later consideration for inclusion in the records category. If an outstanding catch is approved for entry onto the list of species eligible for saltwater record status, then it and all other outstanding catches of that particular fish will be considered for saltwater gamefish record status.

GEORGIA SALTWATER GAMEFISH RECORDS SPECIES CATEGORIES

Amberjack, greater (*Seriola dumeril*)
Barracuda, great (*Sphyræna barracuda*)
Bass, black sea (*Centropristis striata*)
Bluefish (*Pomatomus saltatrix*)
Cobia (*Rachycentron canadum*)
Croaker, Atlantic (*Micropogon undulatus*)
Dolphin (*Coryphaena hippurus*)
Drum, black (*Pogonias cromis*)
Drum, red (*Sciaenops ocellata*)
Flounder (composite)
Grouper, gag* (*Mycteroperca microlepis*)
Grouper, scamp* (*Mycteroperca phenax*)
Grouper, Warsaw* (*Epinephelus nigritus*)
Jack, Crevalle (*Caranz hippos*)

Jewfish* (*Epinephelus itajara*)
 Kingfish (Whiting) (*Menticirrhus*)
 Ladyfish (*Elops saurus*)
 Mackerel, King (*Scomberomorus cavalla*)
 Mackerel, Spanish* (*Scomberomorus maculatus*)
 Marlin, blue (*Makaira nigricans*)
 Marlin, white (*Tetrapturus albidus*)
 Porgy (composite)
 Sailfish (*Istiophorus platypterus*)
 Sea Trout, spotted (*Cynoscion nebulosus*)
 Shark, blacktip* (*Carcharhinus limbatus*)
 Shark, bull* (*Carcharhinus leucas*)
 Shark, dusky* (*Carcharhinus obscurus*)
 Shark, hammerhead (*Sphyrna*)
 Shark, lemon* (*Negaprion brevirostris*)
 Shark, shortfin mako* (*Isurus oxyrinchus*)
 Shark, nurse* (*Ginglymostoma cirratum*)
 Shark, sandbar* (*Carcharhinus milberti*)
 Shark, sand tiger* (*Odontaspis taurus*)
 Shark, thresher (*Alopias*)
 Shark, tiger* (*Galeocerdo cuvieri*)
 Sheepshead (*Archosargus probatocephalus*)
 Snapper, Red (*Lutjanus ccompechanus*)
 Snook (*Centropomus undecimalis*)
 Spadefish, Atlantic (*Chaetodipterus faber*)
 Swordfish (*Xiphias gladius*)
 Tarpon (*Megalops atlantica*)
 Triggerfish, gray (*Balistes caprisicus*)
 Tripletail (*Lobotes surinamensis*)
 Tuna, blackfin* (*Thunnus atlanticus*)
 Tuna, yellowfin* (*Thunnus albacares*)
 Tunny, little* (*Euthynnus alletteratus*)
 Wahoo (*Acanthocybium solanderi*)
 Weakfish (*Cynoscion regalis*)
 *Requires identification by a representative of DNR.

Regulations Governing Record Catches

GENERAL INFORMATION

1. Protested applications or disputed existing records will be referred to the Saltwater Gamefish Records Committee for review. Its decision will be final. DNR reserves the sole right to either grant or reject any record applications. All Saltwater Gamefish Record Committee decisions will be based upon the intent of the regulations.

2. In some instances, DNR may recheck information supplied on a claim. Such action is not to be regarded as doubt of the formal affidavit, but rather as evidence of the extreme care with which DNR will investigate and maintain its records.

3. On record claims, witnesses to the catch are highly desirable if at all possible.

WEIGHTS NEEDED TO DEFEAT OR TIE EXISTING RECORDS

1. To replace a record for a fish weighing less than 20 pounds (9.07 kg), the requirement must weigh at least 4 ounces (113.39 gm) more than the existing record.

2. To replace a record for a fish weighing 20 pounds (9.07 kg) up to 100 pounds (45.35 kg), the replacement must weigh at least 8 ounces (226.7 gm) more than the existing record.

3. To replace a record for a fish weighing 100 pounds (45.35 kg) or more, the replacement must weigh at least one half of 1 percent (.005%) more than the existing record weight. Examples: At 200 pounds (90.71 kg) the additional weight required would be 1 pound (.45 kg); at 400 pounds (181.43 kg) the additional weight required would be 2

pounds (.90 kg).

4. Any catch which matches the weight of an existing record or exceeds the weight by less than the amount required to defeat the record will be considered a tie. In case of a tie claim involving more than two catches, weight must be compared with the original record (first fish to be caught). Nothing weighing less than the original record will be considered.

5. Estimated weights will not be accepted. (See Weighing Requirements).

TIME LIMIT ON CLAIMS

1. Claims for record fish must be received within 30 days of the date of catch.

2. If an incomplete record claim is submitted, it must be accompanied by an explanation of any certain portions which are incomplete. An incomplete claim will be considered for a record if the following conditions are met:

(a) The incomplete claim with explanations of why portions are incomplete must be received by DNR within the time limits specified above.

(b) Missing data must be due to circumstances beyond the control of the angler making the record claim.

(c) All missing data must be supplied within a period of time considered to be reasonable in view of the particular circumstances.

3. Final decisions on incomplete claims will be made by the Saltwater Gamefish Records Committee.

WEIGHING REQUIREMENTS FOR RECORD FISH

1. The weight of the sling, platform, or rope (if one is used to secure the fish on the scales) must be determined and deducted from the total weight.

2. At the time of weighing, the actual tackle used by the angler to catch the fish must be exhibited to the weighmaster and weight witness. Disinterested witnesses to the weight should be used whenever possible.

3. No estimated weights will be accepted. Fish weighed at sea or in other bodies of water will not be accepted.

4. All record fish should be weighed on scales that have been checked and certified for accuracy by government agencies or other qualified and accredited organizations. All scales must be regularly checked for accuracy and certified in accordance with applicable government regulations at least once every twelve months.

5. If at the time of weighing the fish, the scale has not been properly certified within twelve months, it should be checked and certified for accuracy as quickly as possible, and an official report stating the findings of the inspection prior to any adjustments of the scale must be included with the record application.

6. DNR reserves the right to have any scale recertified for accuracy if there are any indications that the scale might not have weighed correctly.

SPECIES IDENTIFICATION

1. If there is the slightest doubt that the fish cannot be properly identified from the photographs and other data submitted, or if the species under consideration for a Georgia Saltwater record is a grouper (including jewfish), Spanish mackerel, shark (excluding hammerhead and thresher sharks), or tuna (including little tunny), the fish must be examined by DNR or its appointed representative to verify the identification. The fish should be retained in a preserved or frozen condition until notified by DNR that the fish need no longer be retained.

2. Regarding all catches submitted to DNR for saltwater record consideration, it is the angler's responsibility to

provide the data necessary for positive identification. If an angler feels that the data the he/she has provided is not complete, he/she should contact DNR for positive identification.

PREPARATION OF RECORD CLAIMS

To apply for a state record, the angler must submit a Georgia Saltwater Gamefish record application form, acceptable photographs of the fish, the tackle used to catch the fish, the scale used to weigh the fish, the angler and the fish.

APPLICATION FORM

1. The official Georgia Saltwater Gamefish record application form must be used for record claims. This form may be reproduced as long as all items are included. The angler should fill in the application personally. DNR also recommends that the angler personally mail the application and photographs. Extreme care should be exercised in measuring the fish as the measurements are often important for weight verification and scientific studies. See the measurement diagram on the record application to be sure you have measured correctly.

2. The angler is responsible for seeing that the necessary signatures and correct addresses of the boat captain, weighmaster, and witnesses are on the application. If a DNR representative is available, he or she should be asked to witness the claim. The name of a boatman, guide or weighmaster repeated as witness is not acceptable.

3. Any deliberate falsification of an application will disqualify the applicant for any future state record, and any existing records will be nullified.

PHOTOGRAPHS

Photographs showing the full length of the fish, the rod and reel used to make the catch, and the scale used to weigh the fish must accompany each record application. A photograph of the angler with the fish is also required.

So that there can be no question of species identification, the clearest possible photos should be submitted.

Photographs should be taken of the fish in a hanging position and also lying on a flat surface on its side. In both types of photographs no part of the fish should be obscured.

When hanging, the fish should be broadside to the camera with the fins fully extended and with the tip of the jaw and sword or spear clearly shown. Do not hold the tip of any fin. Do not stand in front of the fish. Do not hold the fish in your hands. A sky background for the fish is most desirable. Backgrounds cluttered with objects and people many times complicate identification and detract from the photograph.

When photographing a fish lying on its side, the surface beneath the fish should be smooth and a ruler or marked tape placed beside the fish if possible. Photographs from various angles are most helpful.

An additional photograph of the fish on the scale with actual weight visible helps to expedite the application.

Photos taken by daylight are highly recommended if at all possible. NOTE: Since DNR has a bimonthly newsletter to keep anglers up to date on record catches, it is more important than ever that we have clear, publishable photographs of the fish and the angler. If you have action shots of the catch, we would like to see them also. Black and white photographs are preferred.

GEORGIA SALTWATER GAMEFISH RECORDS APPLICATION FORM FOR RECORDING RECORD GAMEFISH CATCHES

Read all angling rules and Georgia Saltwater Gamefish Record requirements before completing and signing this application. This application must be accompanied by photographs as specified in the State record requirements.

DIVISION

_____ Women's _____ Men's

SPECIES

Common name: _____

Scientific name: _____

WEIGHT

lbs., oz.: _____ kg.: _____

LENGTH (See measurements diagrams)

inches: x to x _____ xx to xx _____

cm: x to x _____ xx to xx _____

GIRTH (See measurement diagrams)

inches: _____ cm: _____

DATE OF CATCH: _____

PLACE OF CATCH: _____

METHOD OF CATCH (trolling, casting, fly fishing, etc.): _____

FIGHTING TIME: _____

ANGLER (print name as you wish it to appear on record certificate): _____

Permanent address (include county and address code): _____

Angler's fishing club affiliation (if any): _____

EQUIPMENT

Rod Make: _____

Reel Make: _____ Size: _____

Line Make: _____ Size: _____

Number of hooks: _____

Name of lure, fly or bait: _____

BOAT (if used)

Name: _____

Make: _____

Captain's Name: _____

Signature: _____

Address: _____

Mate's Name: _____

Signature: _____

Address: _____

SCALES

Location: _____

Type: _____

Manufacturer: _____

Date last certified: _____

Person and/or agency that certified scales: _____

Weighmaster: _____

Signature: _____

Address: _____

WITNESSES

Witness to weighing (other than angler, captain or weigh-
master): _____

**Coastal Resources Division
Department of Natural Resources
1200 Glynn Avenue
Brunswick, GA 31520**

Address: _____

Witnesses to catch (other than captain). List two names and
address is possible.

1. _____

2. _____

Number of persons witnessing catch: _____

AFFIDAVIT

I, the undersigned, hereby take oath and attest that the fish described in this application was hooked, fought, and brought to gaff by me without assistance from anyone, except as specifically provided in the regulations; and that it was caught in accordance with Georgia Saltwater Gamefish Records angling rules. I further declare that all information in this application is true and correct to the best of my knowledge.

Signature of angler: _____

Date: _____, 19 _____

When completely filled out and signed, mail this application with photos by quickest means to:

Public Service Section Chief
Coastal Resources Division
Georgia Department of Natural Resources
1200 Glynn Avenue
Brunswick, Georgia 31520
Phone (912) 264-7218

**BULK RATE
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P A I D
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BRUNSWICK, GA.
31520**

The Department of Natural Resources is an equal opportunity employer, and offers all persons the opportunity to compete and participate in each area of DNR employment regardless of race, color, sex, religion, national origin, age, physical or mental handicap or other non-merit factors.

TABLE 2.—TIDAL DIFFERENCES AND OTHER CONSTANTS

1
9
8
0
Tide
Tables

PLACE	DIFFERENCES				RANGES		Mean Tide Level
	Time		Height		Mean	Spring	
	High water	Low water	High water	Low water			
	h. m.	h. m.	feet	feet	feet	feet	
GEORGIA							
Savannah River							
	on SAVANNAH RIVER ENT., p. 100						
Tybee Creek entrance-----	-0 07	+0 02	-0.1	0.0	6.8	8.0	3.4
Beach Hammock-----	+0 01	-0 10	0.0	0.0	6.9	8.1	3.4
Romerly Marsh Creek-----	+0 10	-0 06	+0.2	0.0	7.1	8.3	3.5
<i>Wilmington River</i>							
Savannah-Oglethorpe Hotel-----	+0 16	+0 03	+0.9	0.0	7.8	9.1	3.9
Thunderbolt-----	+0 34	+0 09	+1.0	0.0	7.9	9.2	3.9
North entrance-----	+0 42	+0 41	+0.7	0.0	7.6	8.9	3.8
Isle of Hope, Skidaway River-----	+0 52	+0 25	+0.9	0.0	7.8	9.1	3.9
Ossabaw Sound							
Egg Islands-----	+0 06	+0 07	+0.3	0.0	7.2	8.4	3.6
Vernon View, Burnside River-----	+0 42	+0 28	+0.6	0.0	7.5	8.8	3.8
Coffee Bluff, Forest River-----	+1 07	+0 39	+0.6	0.0	7.5	8.8	3.7
Fort McAllister, Ogeechee River-----	+0 50	+1 13	0.0	0.0	6.9	8.1	3.4
Highway bridge, Ogeechee River-----	+3 21	+4 22	*0.14	*0.14	1.0	1.2	0.5
Cane Patch Creek entrance-----	+0 57	+0 40	+0.3	0.0	7.2	8.4	3.6
St. Catherines and Sapelo Sounds							
Walburg Creek entrance-----	+0 25	+0 20	+0.2	0.0	7.1	8.3	3.6
Kilkenny Club, Kilkenny Creek-----	+0 31	+0 13	+1.0	0.0	7.9	9.2	3.9
Sunbury, Medway River-----	+0 56	+0 42	+0.6	0.0	7.5	8.8	3.8
Belfast, Belfast River-----	+1 25	+1 07	+0.9	0.0	7.8	9.1	3.9
North Newport River-----	+0 58	+0 33	+0.7	0.0	7.6	8.9	3.8
South Newport River-----	+0 39	+0 44	+0.5	0.0	7.4	8.7	3.7
Dallas Bluff, Julienton River-----	+0 50	+1 01	+0.7	0.0	7.6	8.9	3.8
Blackbeard Island-----	+0 20	+0 19	0.0	0.0	6.9	8.1	3.4
Dog Hammock, Sapelo River-----	+0 31	+0 23	+0.2	0.0	7.1	8.3	3.6
Pine Harbor, Sapelo River-----	+1 05	+1 01	+0.3	0.0	7.2	8.4	3.6
Eagle Creek, Mud River-----	+0 23	+0 16	+0.3	0.0	7.2	8.4	3.6
Mud River, at Old Teakettle Creek-----	+0 47	+0 43	+0.5	0.0	7.4	8.7	3.7
Doboy and Altamaha Sounds							
Blackbeard Creek, Blackbeard I-----	+0 21	+0 44	-0.4	0.0	6.5	7.6	3.3
Sapelo Island-----	0 00	+0 02	-0.1	0.0	6.8	8.0	3.4
Hudson Creek entrance-----	+0 39	+0 28	+0.3	0.0	7.2	8.4	3.6
Threemile Cut ent., Darlen River-----	+0 46	+0 52	+0.2	0.0	7.1	8.3	3.5
Darlen, Darlen River-----	+1 10	+1 12	+0.4	0.0	7.3	8.5	3.6
Wolf Island-----	+0 06	+0 35	-0.3	0.0	6.6	7.7	3.3
Champney I., South Altamaha River-----	+1 12	+2 30	-1.7	0.0	5.2	6.1	2.6
Hampton River entrance-----	+0 18	+0 01	-0.3	0.0	6.6	7.8	3.3
Jones Creek ent., Hampton River-----	+1 05	+0 10	+0.3	0.0	7.2	8.5	3.6
St. Simons Sound							
St. Simons Sound bar-----	+0 01	-0 05	-0.4	0.0	6.5	7.6	3.2
St. Simons Light-----	+0 24	+0 28	-0.3	0.0	6.6	7.7	3.3
Frederica River-----	+0 50	+0 53	+0.3	0.0	7.2	8.4	3.6
Troup Creek entrance, Mackay River-----	+0 54	+0 49	+0.3	0.0	7.2	8.4	3.6
Brunswick, East River-----	+0 55	+0 40	+0.4	0.0	7.3	8.5	3.6
<i>Turtle River</i>							
Allied Chemical Corp. docks-----	+1 05	+0 39	+0.7	0.0	7.6	8.9	3.8
Dillard Creek-----	+1 34	+0 59	+1.1	0.0	8.0	9.4	4.0
Buffalo River entrance-----	+1 39	+0 55	+1.1	0.0	8.0	9.4	4.0
Highway bridge, S. Brunswick River-----	+1 09	+0 46	+0.7	0.0	7.6	8.9	3.8
St. Andrew Sound							
Jekyll Point-----	+0 28	+0 28	-0.3	0.0	6.6	7.7	3.3
Jointer Island, Jointer Creek-----	+1 02	+0 49	+0.3	0.0	7.2	8.4	3.6
<i>Little Satilla River</i>							
2.5 miles above mouth-----	+0 47	+0 49	-0.1	0.0	6.8	8.0	3.4
8 miles above mouth-----	+1 15	+1 20	+0.4	0.0	7.3	8.5	3.6
Below Spring Bluff-----	+2 00	+1 49	+0.6	0.0	7.5	8.8	3.7
Dover Bluff, Dover Creek-----	+0 57	+0 49	+0.1	0.0	7.0	8.2	3.5
<i>Satilla River</i>							
Todd Creek entrance-----	+0 43	+0 59	-0.2	0.0	6.7	7.8	3.3
Balley Cut (0.8 mile west of)-----	+0 57	+1 20	0.0	0.0	6.9	8.1	3.4
Ceylon-----	+1 25	+1 53	-0.3	0.0	6.6	7.7	3.3
Burnt Fort-----	+4 46	+5 23	*0.46	*0.46	3.2	3.7	1.6
Cumberland Wharf, Cumberland River-----	+0 40	+0 42	-0.1	0.0	6.8	8.0	3.4
Floyd Creek, 2.8 miles above ent-----	+0 59	+0 39	+0.2	0.0	7.1	8.3	3.5
GEORGIA and FLORIDA							
Cumberland Sound							
St. Marys Entrance, north jetty-----	+0 15	+0 15	-1.1	0.0	5.8	6.8	2.9
Crooked River entrance-----	+1 23	+1 12	-0.1	0.0	6.8	8.0	3.4
Harrietts Bluff, Crooked River-----	+2 09	+2 12	-0.5	0.0	6.4	7.5	3.2
St. Marys, St. Marys River-----	+1 21	+1 13	-0.9	0.0	6.0	7.0	3.0
Crandall, St. Marys River-----	+2 10	+1 59	-1.8	0.0	5.1	6.0	2.5

Predicted tide times and heights are shown for the Georgia coast at the bar at the Savannah River entrance. You may compute the tide times for other points listed by subtracting or adding hours and minutes as indicated. A plus time indicates a later tide and a minus time on earlier tide. Daylight savings time is not used in this table. All daily time predictions are based on Eastern Standard Time meridian. Predicted times may be converted to daylight savings time by adding one hour to these data.

These data are from the 1980 Tide Tables for the East Coast of North and South America, National Ocean Survey, U.S. Department of Commerce, Rockville, Md. 20852.

1 0053 -1.1	12 0300 6.0	23 0002 7.1	1 0206 -0.9	12 0417 6.6	23 0140 6.9
TU 0713 7.8	SA 0937 0.6	W 0621 -0.6	F 0816 7.2	TU 1051 0.1	SA 0808 0.1
1331 -0.5	1511 5.7	1232 6.9	1438 -0.4	1638 6.0	1413 5.9
1936 6.6	2148 0.2	1855 -0.9	2037 6.3	2300 -0.4	2031 -0.3
2 0141 -1.0	13 0359 6.3	24 0102 6.9	2 0248 -0.8	13 0521 7.0	24 0245 6.6
W 0757 7.8	SU 1030 0.3	TH 0724 -0.2	SA 0851 7.1	W 1145 -0.4	SU 0914 0.3
1418 -0.5	1610 5.8	1331 6.5	1515 -0.4	1736 6.4	1523 5.7
2017 6.5	2238 -0.1	1956 -0.7	2111 6.3	2355 -0.9	2135 -0.2
3 0227 -0.9	14 0457 6.7	25 0204 6.8	3 0328 -0.6	14 0617 7.5	25 0353 6.5
TH 0836 7.6	M 1123 0.0	F 0832 0.0	SU 0925 6.9	TH 1238 -0.8	M 1017 0.3
1502 -0.4	1707 6.0	1433 6.1	1550 -0.3	1832 6.9	1630 5.7
2058 6.4	2329 -0.4	2056 -0.6	2146 6.2		2231 -0.2
4 0310 -0.7	15 0550 7.1	26 0310 6.8	4 0405 -0.4	15 0048 -1.2	26 0457 6.6
F 0913 7.3	TU 1215 -0.3	SA 0938 0.0	M 0958 6.7	F 0708 7.9	TU 1111 0.2
1541 -0.3	1801 6.3	1542 6.0	1625 -0.2	1331 -1.2	1731 5.9
2136 6.2		2156 -0.6	2220 6.1	1922 7.3	2323 -0.3
5 0352 -0.5	16 0019 -0.8	27 0417 6.9	5 0443 -0.2	16 0142 -1.6	27 0553 6.8
SA 0952 7.1	W 0639 7.5	SU 1038 -0.1	TU 1035 6.5	SA 0755 8.1	W 1200 0.1
1621 -0.1	1304 -0.6	1648 5.9	1701 0.0	1420 -1.5	1819 6.2
2216 6.0	1851 6.6	2252 -0.7	2259 6.1	2013 7.6	
6 0431 -0.2	17 0107 -1.1	28 0518 7.0	6 0522 0.1	17 0234 -1.7	28 0014 -0.5
SU 1031 6.8	TH 0725 7.8	M 1133 -0.2	W 1112 6.2	SU 0844 8.2	TH 0638 6.9
1659 0.1	1353 -0.9	1747 6.1	1738 0.1	1509 -1.7	1246 -0.1
2256 5.9	1938 6.9	2345 -0.8	2339 6.0	2102 7.8	1901 6.4
7 0512 0.1	18 0158 -1.3	29 0611 7.1	7 0607 0.3	18 0325 -1.7	29 0100 -0.6
M 1109 6.5	F 0812 8.0	TU 1224 -0.3	TH 1154 6.0	M 0933 8.0	F 0717 7.0
1738 0.3	1442 -1.2	1838 6.2	1821 0.3	1557 -1.7	1328 -0.2
2338 5.8	2027 7.1			2152 7.8	1939 6.5
8 0559 0.4	19 0248 -1.4	30 0034 -0.8	8 0025 6.0	19 0416 -1.6	FEBRUARY
TU 1153 6.2	SA 0859 8.0	W 0659 7.2	F 0655 0.6	TU 1023 7.7	
1821 0.4	1529 -1.3	1311 -0.3	1239 5.8	1645 -1.6	
	2116 7.2	1922 6.3	1908 0.4	2248 7.7	
9 0023 5.7	20 0339 -1.4	31 0122 -0.9	9 0114 6.0	20 0508 -1.2	
W 0647 0.6	SU 0947 7.9	TH 0739 7.3	SA 0754 0.7	W 1117 7.3	
1238 6.0	1616 -1.3	1357 -0.4	1330 5.7	1735 -1.3	
1910 0.5	2208 7.2	2001 6.4	2004 0.4	2341 7.5	
10 0114 5.8	21 0429 -1.2	JANUARY	10 0209 6.1	21 0603 -0.7	
TH 0743 0.7	M 1040 7.6		SU 0855 0.6	TH 1212 6.8	
1324 5.9	1706 -1.2		1426 5.6	1829 -0.9	
2001 0.5	2304 7.1	1980	2103 0.2		
11 0205 5.8	22 0524 -0.9		11 0312 6.2	22 0040 7.2	
F 0842 0.7	TU 1133 7.3		M 0954 0.4	F 0703 -0.2	
1416 5.7	1759 -1.1		1530 5.7	1311 6.3	
2055 0.4			2203 -0.1	1929 -0.5	

1 0247 -0.2	12 0603 7.5	23 0249 6.1	1 0347 -0.2	12 0126 -0.9	23 0341 5.9
TH 0829 6.6	M 1214 -1.3	F 0924 0.6	SU 0923 6.4	TH 0728 7.1	M 1012 0.3
1447 0.0	1828 8.6	1540 6.1	1542 -0.1	1335 -1.2	1630 6.6
2049 7.5		2153 0.8	2150 7.5	1951 8.6	2252 0.5
2 0326 -0.1	13 0049 -1.1	24 0345 6.1	2 0430 -0.1	13 0217 -0.9	24 0434 5.9
F 0905 6.5	TU 0656 7.6	SA 1010 0.4	M 1009 6.4	F 0818 7.0	TU 1057 0.1
1524 0.1	1305 -1.5	1633 6.4	1627 0.0	1426 -1.1	1721 6.9
2124 7.4	1920 8.9	2241 0.5	2237 7.4	2037 8.4	2339 0.3
3 0406 0.0	14 0143 -1.2	25 0438 6.1	3 0516 -0.1	14 0305 -0.7	25 0526 6.1
SA 0942 6.4	W 0746 7.6	SU 1054 0.3	TU 1101 6.4	SA 0905 6.8	W 1139 0.0
1602 0.2	1356 -1.5	1721 6.7	1719 0.2	1513 -0.8	1806 7.2
2205 7.3	2008 8.9	2329 0.3	2330 7.2	2123 8.0	
4 0447 0.2	15 0234 -1.2	26 0526 6.2	4 0609 -0.1	15 0352 -0.5	26 0027 0.1
SU 1024 6.3	TH 0834 7.4	M 1137 0.1	W 1159 6.5	SU 0951 6.5	TH 0612 6.2
1643 0.3	1446 -1.3	1800 7.0	1818 0.3	1600 -0.5	1225 -0.1
2251 7.2	2056 8.7			2208 7.6	1848 7.5
5 0533 0.3	16 0325 -1.0	27 0014 0.1	5 0026 7.1	16 0437 -0.3	27 0112 -0.1
M 1115 6.2	F 0923 7.1	TU 0608 6.3	TH 0706 -0.1	M 1040 6.3	F 0657 6.4
1733 0.4	1534 -1.0	1219 0.0	1301 6.7	1646 -0.1	1310 -0.3
2343 7.1	2142 8.3	1840 7.3	1923 0.3	2251 7.2	1927 7.7
6 0626 0.4	17 0413 -0.7	28 0059 0.0	6 0127 6.9	17 0520 0.0	28 0158 -0.3
TU 1212 6.2	SA 1014 6.8	W 0648 6.4	F 0806 -0.3	TU 1128 6.1	SA 0739 6.5
1829 0.5	1624 -0.6	1259 -0.1	1404 6.9	1735 0.3	1355 -0.4
	2232 7.8	1915 7.5	2033 0.2	2336 6.8	2007 7.9
7 0043 6.9	18 0501 -0.3	29 0141 -0.2	7 0232 6.8	18 0605 0.3	29 0244 -0.4
W 0726 0.4	SU 1106 6.4	TH 0725 6.5	SA 0906 -0.5	W 1217 6.0	SU 0822 6.6
1314 6.4	1714 -0.1	1339 -0.1	1510 7.2	1823 0.6	1440 -0.4
1939 0.5	2322 7.3	1950 7.6	2138 0.0		2049 7.9
8 0144 6.9	19 0551 0.1	30 0223 -0.2	8 0337 6.8	19 0023 6.5	30 0327 -0.5
TH 0830 0.2	M 1202 6.1	F 0802 6.5	SU 1004 -0.8	TH 0654 0.5	M 0906 6.7
1420 6.6	1805 0.3	1419 -0.1	1615 7.6	1305 5.9	1528 -0.4
2050 0.3		2027 7.7	2239 -0.3	1919 0.9	2134 7.8
9 0252 6.9	20 0013 6.9	31 0305 -0.2	9 0442 6.9	20 0109 6.2	JUNE
F 0930 -0.2	TU 0642 0.4	SA 0841 6.5	M 1058 -1.1	F 0743 0.5	
1526 7.0	1255 5.9	1459 -0.1	1716 8.1	1355 6.0	
2156 0.0	1902 0.7	2105 7.6	2337 -0.6	2014 1.0	
10 0359 7.0	21 0105 6.5	MAY	10 0544 7.0	21 0157 6.0	1980
SA 1028 -0.6	W 0735 0.6		TU 1152 -1.2	SA 0833 0.5	
1633 7.5	1351 5.9		1811 8.4	1447 6.1	
2257 -0.4	1959 0.9			2109 0.9	
11 0505 7.3	22 0158 6.2	1980	11 0032 -0.8	22 0249 5.9	
SU 1121 -1.0	TH 0830 0.7		W 0637 7.1	SU 0924 0.4	
1734 8.1	1447 5.9		1245 -1.3	1540 6.3	
2355 -0.8	2058 0.9		1903 8.6	2201 0.7	

The NOS tide forecasts are given on a 24 hour clock; for example, 1200 is noon and 2300 is 11 p.m. Standard Time. On the 1st Sunday in November to these tides. In all other months, these predictions are for average low tide on the chart datum on the

EXA
On Friday (F), 1939 hours (7:39 p.m.) a correction of 6.5 feet is added to the chart to obtain the particular tidal height is a maximum of 6.5 feet. Feb. 29 at 1328 hours should be subtracted from the depth.

The tide forecasts for Savannah River are given in practical purposes equivalent to the depth in miles offshore of (Wassaw, Doboy, and other reefs) is also represented in Tables, furnishes (time differences) for miles from the Georgia C

EXA
In the shrimp grounds at Darien, Ga., the Fish Commission held at the bridge over the River each spring at the beginning of the tide so that each boat can negotiate the turn easily. From 10 to 15 minutes to the River at Darien, you should allow ten minutes to the Outer Bar. High tide on Sunday, May 18 is at 13:10 (EST). By referring to the (Differences) for Savannah (takes the tide was at 13:10 minutes to make it to the Altamaha Sea Level. +1:10 (add for Daylight Savings p.m.). The high tide is at 13:16 or 1:16 p.m. (6.4 + 0.4).

casts are given for
 es are given on the
 example 0600 is 6
 1800 is 6 p.m.; and
 cause of Daylight
 Savings in May to
 add one hour
 Georgia the height
 skoned from the
 adings. This is the
 nautical charts.

PLEASE:
 February 29, 1980 at
 n.) the tide height
 o depth shown on
 the total depth at
 Note that if the
 us quantity -- e.g.,
 urs (1:28 p.m.) it
 l from the charted

for Georgia are at
 Entrance. For
 this is also
 Outer Bar several
 ch sound entrance
 c.). Table 2, which
 l on the Tide
 differences
 es and height
 y additional places
 st.

PLEASE:
 g community of
 ssing of the Fleet is
 over the Darien
 st after high water
 he outgoing (ebb)
 shrimp boat can
 t the bridge once it
 ble 2 for the Darien
 add one hour and
 icted tide at the
 de prediction for
 4 feet at 11:06 a.m.
 to Table 2 (Tidal
 arien you find it
 one hour and ten
 way up Doboy and
 Th 11:06 a.m.
 e 00 (add for
) = 13:16 (1:16
 e would occur at
 d at a height of 6.8

1 0144 -0.6 SA 0752 7.0 1408 -0.3 2012 6.6	12 0343 6.7 W 1022 0.1 1607 6.2 2234 -0.3	23 0115 6.9 SU 0743 0.4 1351 5.9 2005 0.2	1 0236 -0.4 TU 0826 6.9 1446 -0.1 2045 7.1	12 0529 7.5 SA 1147 -0.9 1753 7.9	23 0243 6.3 W 0914 0.7 1532 5.9 2137 0.7
2 0223 -0.6 SU 0824 7.0 1445 -0.3 2044 6.7	13 0452 7.1 TH 1118 -0.4 1713 6.8 2334 -0.8	24 0216 6.6 M 0848 0.6 1457 5.8 2107 0.3	2 0313 -0.3 W 0858 6.7 1518 0.0 2117 7.1	13 0012 -1.0 SU 0625 7.8 1238 -1.3 1848 8.4	24 0345 6.2 TH 1005 0.6 1628 6.1 2230 0.5
3 0302 -0.6 M 0856 6.9 1518 -0.3 2115 6.7	14 0552 7.5 F 1212 -0.9 1811 7.4	25 0324 6.4 TU 0948 0.6 1607 5.8 2207 0.3	3 0350 -0.2 TH 0931 6.6 1552 0.1 2150 7.1	14 0107 -1.4 M 0717 8.0 1330 -1.6 1938 8.8	25 0441 6.3 F 1054 0.5 1718 6.4 2318 0.3
4 0339 -0.4 TU 0928 6.7 1552 -0.2 2147 6.6	15 0030 -1.2 SA 0648 7.9 1305 -1.3 1906 7.9	26 0428 6.4 W 1044 0.5 1707 6.0 2301 0.1	4 0426 0.0 F 1007 6.4 1626 0.2 2227 7.0	15 0201 -1.5 TU 0806 8.1 1420 -1.7 2026 8.9	26 0527 6.4 SA 1137 0.3 1800 6.7
5 0416 -0.2 W 1000 6.5 1624 0.0 2221 6.6	16 0125 -1.6 SU 0737 8.2 1355 -1.6 1956 8.3	27 0523 6.5 TH 1130 0.3 1753 6.3 2349 0.0	5 0508 0.3 SA 1047 6.3 1704 0.4 2312 6.9	16 0252 -1.5 W 0854 7.9 1509 -1.6 2115 8.8	27 0003 0.1 SU 0609 6.6 1217 0.1 1837 7.0
6 0453 0.0 TH 1037 6.4 1659 0.1 2301 6.5	17 0218 -1.7 M 0825 8.2 1444 -1.8 2045 8.5	28 0609 6.7 F 1215 0.2 1835 6.6	6 0551 0.5 SU 1135 6.1 1751 0.5	17 0342 -1.3 TH 0944 7.5 1558 -1.3 2204 8.4	28 0047 -0.1 M 0648 6.7 1257 0.0 1912 7.3
7 0533 0.3 F 1117 6.2 1738 0.3 2344 6.4	18 0309 -1.7 TU 0914 8.1 1533 -1.8 2134 8.4	29 0035 -0.2 SA 0648 6.8 1256 0.0 1911 6.8	7 0003 6.8 M 0646 0.6 1229 6.1 1850 0.6	18 0432 -0.9 F 1035 7.1 1648 -0.8 2256 7.9	29 0128 -0.2 TU 0722 6.7 1335 -0.1 1944 7.4
8 0620 0.5 SA 1202 6.0 1823 0.4	19 0400 -1.5 W 1003 7.7 1621 -1.5 2227 8.2	30 0117 -0.3 SU 0723 6.9 1334 -0.1 1943 7.0	8 0103 6.7 TU 0748 0.6 1329 6.1 2000 0.6	19 0522 -0.4 SA 1130 6.6 1738 -0.3 2349 7.4	30 0209 -0.2 W 0756 6.7 1411 0.0 2017 7.5
9 0033 6.4 SU 0714 0.7 1252 5.9 1921 0.5	20 0451 -1.1 TH 1056 7.2 1711 -1.1 2320 7.8	31 0158 -0.4 M 0755 6.9 1411 -0.1 2015 7.1	9 0205 6.7 W 0853 0.4 1436 6.3 2109 0.3	20 0618 0.1 SU 1226 6.2 1834 0.2	
10 0129 6.4 M 0817 0.7 1353 5.8 2026 0.4	21 0543 -0.6 F 1151 6.7 1804 -0.6		10 0315 6.8 TH 0956 0.0 1545 6.7 2215 -0.1	21 0046 6.9 M 0714 0.5 1327 6.0 1935 0.6	

MARCH

1980

APRIL

1980

1 0412 -0.6 TU 0957 6.8 1616 -0.4 2223 7.7	12 0158 -0.5 SA 0801 6.8 1406 -0.8 2020 8.1	23 0345 5.9 W 1017 0.3 1637 6.9 2305 0.6	1 0528 -0.8 F 1130 7.6 1749 -0.2 2356 7.4	12 0301 -0.1 TU 0901 6.9 1512 -0.1 2110 7.6	23 0511 6.6 SA 1130 0.0 1753 7.8
2 0459 -0.6 W 1051 6.8 1708 -0.2 2316 7.4	13 0245 -0.4 SU 0846 6.7 1453 -0.6 2102 7.8	24 0444 6.0 TH 1107 0.1 1729 7.2 2355 0.3	2 0621 -0.6 SA 1229 7.5 1851 0.2	13 0338 0.0 W 0936 6.8 1552 0.1 2144 7.3	24 0016 0.1 SU 0606 7.1 1222 -0.3 1840 8.3
3 0549 -0.5 TH 1148 6.9 1805 0.0	14 0329 -0.3 M 0928 6.6 1538 -0.4 2139 7.5	25 0539 6.3 F 1155 -0.1 1819 7.6	3 0054 7.0 SU 0719 -0.5 1331 7.5 1957 0.4	14 0414 0.2 TH 1014 6.7 1631 0.4 2219 7.1	25 0107 -0.3 M 0658 7.6 1315 -0.6 1930 8.6
4 0012 7.2 F 0644 -0.5 1247 7.0 1908 0.2	15 0408 -0.2 TU 1011 6.4 1621 -0.1 2219 7.2	26 0045 0.0 SA 0630 6.6 1244 -0.3 1904 7.9	4 0155 6.6 M 0821 -0.3 1434 7.5 2104 0.5	15 0448 0.3 F 1051 6.7 1712 0.7 2258 6.8	26 0154 -0.7 TU 0745 8.0 1407 -0.8 2016 8.7
5 0110 6.9 SA 0743 -0.5 1348 7.2 2015 0.2	16 0448 0.0 W 1053 6.3 1703 0.3 2258 6.9	27 0133 -0.3 SU 0718 6.9 1333 -0.5 1948 8.2	5 0300 6.4 TU 0922 -0.3 1540 7.5 2207 0.4	16 0525 0.5 SA 1130 6.6 1754 1.0 2338 6.5	27 0241 -1.0 W 0835 8.3 1457 -0.9 2102 8.6
6 0212 6.7 SU 0843 -0.6 1451 7.4 2122 0.1	17 0528 0.2 TH 1135 6.2 1746 0.6 2340 6.6	28 0219 -0.6 M 0804 7.2 1423 -0.7 2033 8.3	6 0409 6.3 W 1020 -0.3 1646 7.6 2307 0.3	17 0605 0.7 SU 1215 6.5 1842 1.2	28 0329 -1.1 TH 0926 8.4 1547 -0.8 2150 8.3
7 0317 6.5 M 0941 -0.7 1557 7.6 2224 0.0	18 0609 0.4 F 1218 6.2 1834 0.9	29 0306 -0.8 TU 0852 7.4 1512 -0.7 2119 8.2	7 0515 6.4 TH 1116 -0.4 1745 7.8	18 0023 6.3 M 0652 0.9 1302 6.5 1939 1.4	29 0416 -1.0 F 1016 8.4 1640 -0.5 2242 8.0
8 0425 6.5 TU 1038 -0.8 1700 7.8 2321 -0.2	19 0023 6.3 SA 0654 0.5 1305 6.2 1927 1.0	30 0352 -0.9 W 0942 7.5 1603 -0.7 2208 8.0	8 0000 0.1 F 0612 6.6 1208 -0.4 1835 7.9	19 0111 6.2 TU 0745 1.0 1353 6.6 2039 1.4	30 0506 -0.8 SA 1112 8.2 1733 -0.1 2338 7.5
9 0529 6.6 W 1132 -0.9 1758 8.1	20 0108 6.1 SU 0742 0.6 1351 6.2 2023 1.1	31 0439 -0.9 TH 1034 7.6 1655 -0.4 2259 7.7	9 0051 0.0 SA 0701 6.8 1259 -0.5 1919 8.0	20 0204 6.0 W 0843 0.9 1453 6.7 2136 1.2	31 0558 -0.5 SU 1210 8.0 1833 0.3
10 0016 -0.4 TH 0624 6.7 1225 -0.9 1849 8.2	21 0156 6.0 M 0835 0.6 1445 6.4 2120 1.0		10 0137 -0.1 SU 0745 6.9 1346 -0.4 2000 7.9	21 0306 6.1 TH 0940 0.7 1553 7.0 2231 0.9	
11 0110 -0.4 F 0715 6.8 1315 -0.9 1935 8.2	22 0250 5.9 TU 0927 0.5 1541 6.6 2214 0.8		11 0219 -0.1 M 0824 6.9 1431 -0.3 2036 7.8	22 0407 6.3 F 1036 0.4 1655 7.4 2326 0.5	

JULY

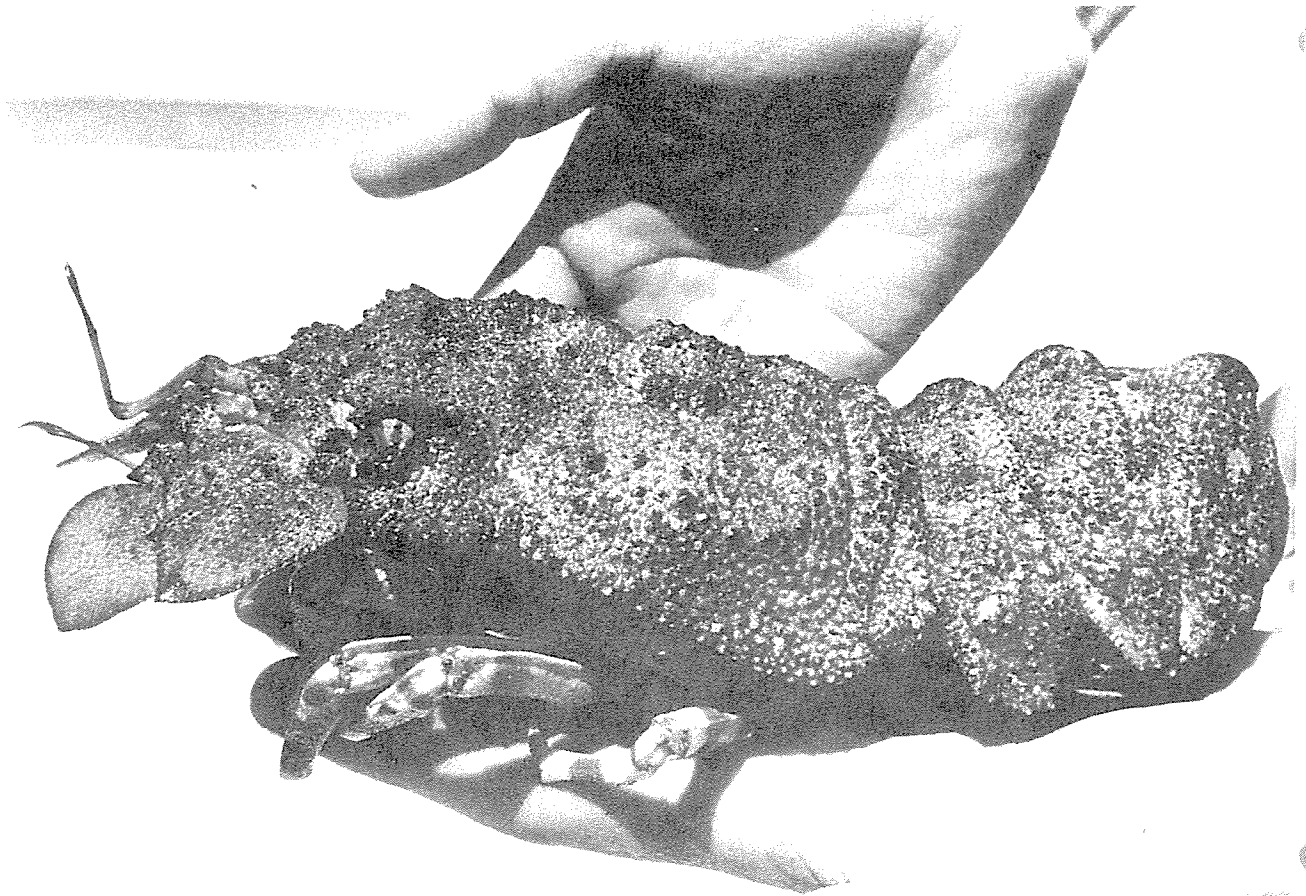
1980

AUGUST

1980

1 0036 7.1	12 0339 0.4	23 0038 -0.5	1 0124 6.7	12 0336 0.6	23 0101 -1.1
M 0655 -0.1	F 0936 7.3	TU 0637 8.3	W 0737 0.6	SU 0936 7.6	TH 0708 9.2
1311 7.8	1600 0.5	1256 -0.6	1353 7.5	1611 0.8	1330 -0.9
1938 0.7	2144 7.2	1907 8.8	2024 1.1	2147 7.0	1936 8.6
2 0139 6.7	13 0411 0.5	24 0128 -0.9	2 0229 6.5	13 0411 0.8	24 0152 -1.3
TU 0758 0.2	SA 1011 7.2	W 0728 8.8	TH 0841 0.8	M 1013 7.4	F 0758 9.4
1415 7.6	1639 0.8	1348 -0.9	1500 7.3	1650 1.0	1423 -0.9
2047 0.9	2219 7.0	1955 8.9	2127 1.1	2225 6.8	2023 8.5
3 0247 6.4	14 0447 0.7	25 0216 -1.1	3 0340 6.5	14 0448 1.0	25 0241 -1.3
W 0903 0.3	SU 1048 7.1	TH 0817 9.1	F 0943 0.8	TU 1055 7.3	SA 0847 9.4
1522 7.5	1718 1.1	1440 -0.9	1605 7.3	1734 1.3	1514 -0.8
2149 0.9	2259 6.7	2042 8.8	2225 1.0	2311 6.6	2112 8.2
4 0357 6.4	15 0522 0.9	26 0304 -1.2	4 0442 6.7	15 0530 1.1	26 0331 -1.1
TH 1003 0.3	M 1730 7.0	F 0906 9.1	SA 1038 0.6	W 1144 7.2	SU 0938 9.1
1630 7.5	1804 1.3	1531 -0.8	1701 7.4	1825 1.4	1606 -0.5
2248 0.7	2343 6.5	2131 8.5	2313 0.8		2203 7.8
5 0503 6.6	16 0605 1.1	27 0352 -1.0	5 0537 7.0	16 0003 6.5	27 0421 -0.7
F 1100 0.2	TU 1218 6.9	SA 0957 9.0	SU 1129 0.5	TH 0625 1.3	M 1030 8.7
1727 7.6	1857 1.5	1623 -0.5	1750 7.5	1239 7.1	1658 -0.1
2340 0.6		2223 8.0	2357 0.6	1926 1.5	2258 7.3
6 0558 6.8	17 0033 6.4	28 0442 -0.7	6 0619 7.3	17 0102 6.4	28 0512 -0.2
SA 1151 0.1	W 0700 1.2	SU 1051 8.7	M 1214 0.4	F 0730 1.3	TU 1126 8.2
1817 7.8	1313 6.9	1716 0.0	1832 7.6	1339 7.1	1753 0.4
	1957 1.6	2319 7.5		2030 1.3	2358 6.9
7 0027 0.4	18 0128 6.3	29 0536 -0.3	7 0040 0.5	18 0205 6.6	29 0608 0.3
SU 0645 7.1	TH 0801 1.2	M 1149 8.3	TU 0657 7.5	SA 0839 1.1	W 1226 7.7
1238 0.0	1414 7.0	1813 0.5	1259 0.3	1445 7.3	1852 0.8
1859 7.9	2100 1.4		1906 7.7	2131 0.9	
8 0111 0.3	19 0232 6.4	30 0018 7.1	8 0118 0.4	19 0312 6.9	30 0102 6.5
M 0722 7.2	F 0909 1.0	TU 0633 0.2	W 0733 7.7	SU 0945 0.7	TH 0710 0.7
1322 0.0	1518 7.2	1250 7.9	1339 0.2	1554 7.5	1326 7.3
1936 7.9	2201 1.0	1916 0.9	1938 7.6	2226 0.4	1954 1.1
9 0152 0.2	20 0337 6.6	SEPTEMBER			31 0204 6.4
TU 0759 7.4	SA 1009 0.6	1980			F 0813 1.0
1406 0.0	1623 7.6	1980			1427 7.0
2008 7.8	2256 0.6	1980			2055 1.1
10 0229 0.2	21 0443 7.1	OCTOBER			
W 0831 7.4	SU 1107 0.2	1980			
1445 0.1	1724 8.0	1980			
2040 7.6	2347 0.0	1980			
11 0303 0.3	22 0542 7.7	1980			
TH 0905 7.4	M 1201 -0.3	1980			
1523 0.3	1819 8.4	1980			
2112 7.5		1980			

1 0311 6.4	12 0424 0.6	23 0220 -1.4	1 0325 6.2	12 0451 0.1	23 0253 -1.3
SA 0916 1.0	W 1029 7.4	SU 0830 9.1	M 0934 0.9	F 1059 7.2	TU 0902 8.3
1527 6.9	1709 0.9	1459 -0.9	1532 6.3	1738 0.2	1529 -0.8
2150 1.0	2247 6.5	2055 7.7	2157 0.6	2324 6.4	2128 6.9
2 0412 6.6	13 0509 0.8	24 0310 -1.2	2 0420 6.4	13 0544 0.3	24 0341 -1.1
SU 1009 0.9	TH 1119 7.2	M 0919 8.8	TU 1025 0.7	SA 1154 7.0	W 0950 7.9
1622 6.9	1800 1.0	1547 -0.6	1625 6.3	1831 0.2	1616 -0.6
2239 0.8	2341 6.4	2147 7.3	2243 0.4		2218 6.6
3 0504 6.8	14 0602 0.9	25 0400 -0.8	3 0507 6.7	14 0023 6.5	25 0427 -0.7
M 1059 0.7	F 1215 7.1	TU 1010 8.4	W 1113 0.5	SU 0645 0.4	TH 1035 7.4
1713 7.0	1857 1.0	1637 -0.3	1713 6.4	1252 6.9	1701 -0.3
2322 0.6		2240 6.9	2325 0.3	1931 0.1	2304 6.3
4 0550 7.1	15 0041 6.5	26 0451 -0.4	4 0550 7.0	15 0124 6.7	26 0516 -0.3
TU 1146 0.5	SA 0705 0.9	W 1101 7.9	TH 1158 0.3	M 0754 0.4	F 1122 7.0
1755 7.1	1314 7.1	1728 0.1	1755 6.5	1354 6.8	1745 0.0
	1959 0.8	2336 6.6		2032 -0.2	2357 6.1
5 0003 0.4	16 0144 6.7	27 0543 0.1	5 0006 0.1	16 0230 7.0	27 0604 0.2
W 0627 7.4	SU 0814 0.8	TH 1157 7.4	F 0630 7.2	TU 0902 0.2	SA 1210 6.6
1230 0.4	1419 7.1	1821 0.5	1241 0.2	1458 6.8	1834 0.3
1834 7.2	2101 0.4		1835 6.6	2132 -0.5	
6 0043 0.3	17 0251 7.0	28 0034 6.3	6 0047 0.0	17 0336 7.3	28 0046 5.9
TH 0701 7.6	M 0924 0.5	F 0638 0.5	SA 0704 7.4	W 1005 -0.1	SU 0658 0.5
1312 0.3	1524 7.2	1250 6.9	1325 0.1	1605 6.8	1255 6.2
1907 7.2	2159 -0.1	1918 0.7	1912 6.6	2230 -0.9	1926 0.5
7 0120 0.2	18 0357 7.5	29 0132 6.1	7 0126 -0.1	18 0441 7.8	29 0139 5.8
F 0733 7.7	TU 1025 0.1	SA 0738 0.8	SU 0740 7.5	TH 1105 -0.5	M 0753 0.7
1352 0.2	1630 7.5	1343 6.6	1405 0.0	1710 7.0	1344 6.0
1941 7.2	2252 -0.6	2015 0.8	1946 6.6	2324 -1.2	2018 0.5
8 0157 0.2	19 0501 8.1	30 0229 6.1	8 0206 -0.1	19 0542 8.2	30 0230 5.9
SA 0805 7.8	W 1123 -0.4	SU 0839 0.9	M 0815 7.6	F 1203 -0.7	TU 0850 0.8
1431 0.3	1731 7.7	1437 6.4	1446 0.0	1808 7.1	1434 5.8
2013 7.1	2346 -1.0	2108 0.8	2023 6.6		2109 0.5
9 0233 0.3	20 0558 8.6	NOVEMBER			31 0323 6.0
SU 0837 7.7	TH 1219 -0.7	1980			W 0945 0.7
1510 0.4	1825 7.9	1980			1528 5.7
2046 6.9		1980			2159 0.3
10 0309 0.4	21 0038 -1.3	1980			
M 0909 7.6	F 0651 9.0	1980			
1547 0.5	1313 -0.9	1980			
2121 6.8	1917 8.0	1980			
11 0344 0.5	22 0130 -1.4	1980			
TU 0947 7.5	SA 0741 9.2	1980			
1628 0.7	1406 -1.0	1980			
2200 6.6	2006 7.9	1980			



A Spanish lobster or "bulldozer" found at the Savannah Snapper Banks.

(Photo by Steve Olsson)

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Department of Natural Resources
1200 Glynn Avenue
Brunswick, GA 31523

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