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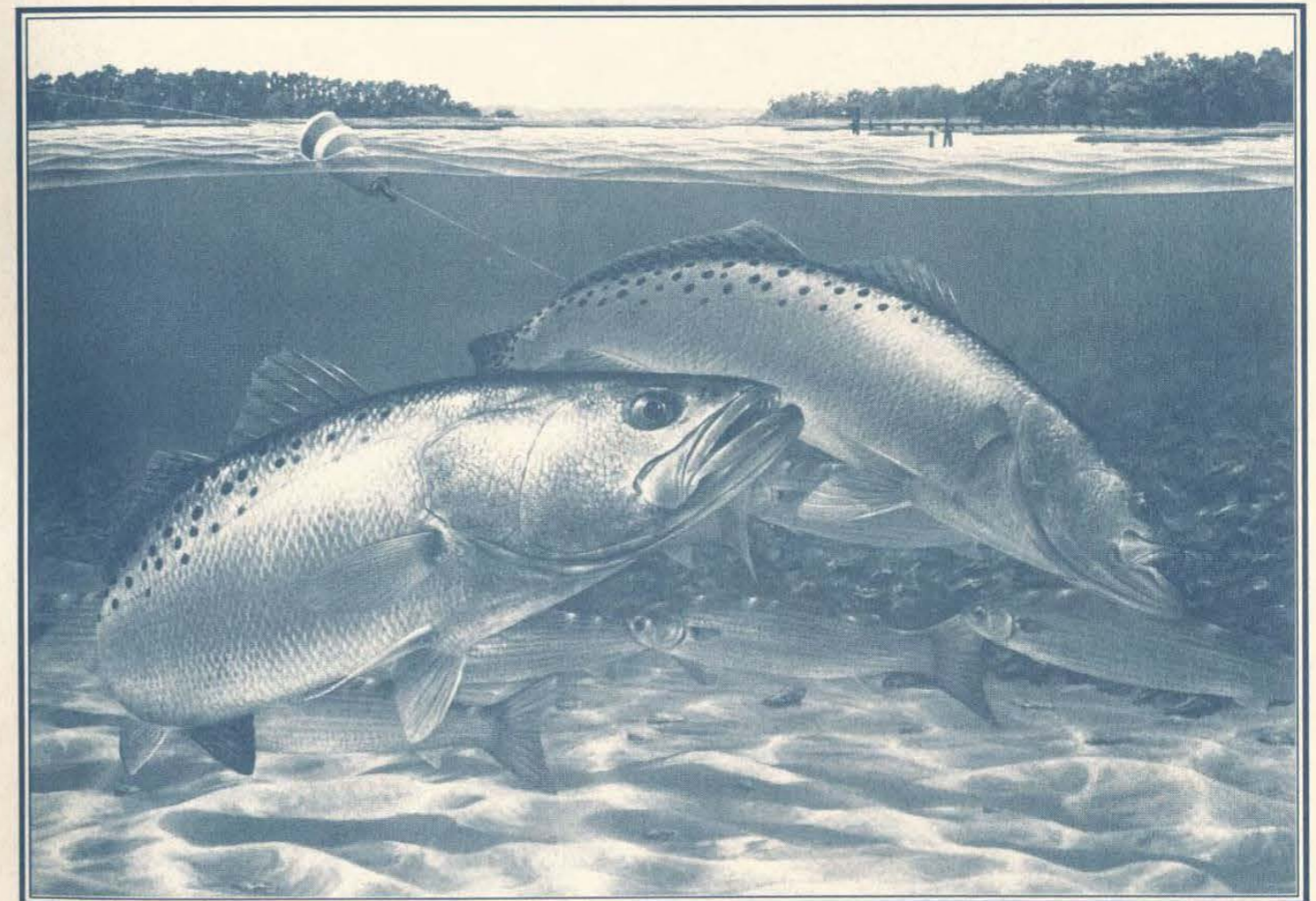
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# SPOTTED SEATROUT

## Natural History and Fishing Techniques in South Carolina

by  
Dr. Charles Wenner  
and  
John Archambault

Educational Report No. 18



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Marine Resources Research Institute  
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South Carolina Department of  
Natural Resources  
Post Office Box 12559  
Charleston, SC 29422

## PREFACE

We began our studies of the inshore species of fishes that are of recreational importance in coastal South Carolina about nine years ago. In the fall of 1992, the South Carolina Department of Natural Resources released Educational Report No. 17 entitled "Red Drum: Natural History and Fishing Techniques in South Carolina". The purpose of the report was to inform the angling public about this fine fish in our state's waters. As mentioned in the booklet, it was the first of an intended series that will cover additional species of fishes. Here (finally) is the second.

The research that provided the basic information about the natural history of this animal was paid for by your tax dollars in two ways. First, some funds were provided directly by the state to the Department of Natural Resources which then funded our work. The remainder of the support was obtained from the federal trust fund established by the Sport Fish Restoration Act. In essence, revenues derived from excise taxes on sport fishing equipment as well as taxes from fuel used by boaters are placed in an account that is administered by the U.S. Fish and Wildlife Service. Each state receives an allocation based on factors such as the number of fishermen. The cost of printing this document was paid from revenues obtained from the Fishing Stamp.

Two people wrote this booklet, however, the work that went into the research and layout of this publication was the result of the efforts of several people. Bill Roumillat has commented on many drafts of the documents. Fred Holland gave the beast a very thorough going over. Their comments and suggestions were greatly appreciated, however, we are responsible for any errors of fact or presentation. During the past few years, numerous people have helped us sampling. Bill Roumillat, Susan Tyree, Chris Walton, Joe Moran, Mark Maddox, Louie Daniel, and George Reikirk have spent many an hour with us in the field. There is no way we could have completed this without their help. Karen Swanson converted our 'stickman drawings' into intelligent presentations and did the camera ready copy for the printer. To all, thank you for your efforts.

## A NOTE OF THANKS AND APPRECIATION

by Charlie Wenner

In the first guidebook of this series (*Red Drum: Natural History and Fishing Techniques in South Carolina*), I dedicated the work to the late Colonel Jim Rathbun for his effort on behalf of sportfishing in particular, and marine conservation in general in our state. For this present work, I feel a note of thanks is more appropriate.

When I think of spotted seatrout (trout to all folks of coastal South Carolina), I think of two people. One older gentleman (and he'll probably cuss me for calling him old) worked with Colonel Rathbun on some of his conservation oriented missions, and the other has played a major role in bringing 'art' into the science of inshore sportfishing in addition to promoting catch and release fishing.

The old guy is Mr. Joe Detyens who has forgotten more about trout fishing than I will ever know. Thanks Mr. Detyens for all your efforts on behalf of the promotion of the wise use of marine and estuarine resources. Thanks for working with the late Colonel and thanks for continuing the good fight for the proper use of our fishery resources in South Carolina.

The other guy, much younger in age, has been a vocal proponent of catch and release and fishing for the future. I have seen him in action during a demonstration, and it brought to mind two memories; the first was the flyfishing scenes in "A River Runs Through It", and the other was picking my flies from various forms of vegetation on the banks of freshwater streams in western New York state thirty years ago. I spent more time with my fly in the trees than with it slowly drifting across the surface of a pool full of brook trout. This guy is Mike Able who has played a significant role in promoting saltwater flyfishing in our state. In addition to Mike, the members of the "Boca-Morris Pass Fly Fishing Club" have promoted the 'art' of flyfishing and the catch and release of marine gamefish.

Knowing that people like these care makes my job much easier. Thanks Mr. Detyens (my Mom always told me to respect my elders), Mike, and the members of the Boca-Morris Pass Fly Fishing Club. Your concern and work today will result in future generations having the same fishing opportunities as we presently have.

## INTRODUCTION

by Charlie Wenner

Most fishermen consider fall to be the best time of the year. The air is crisp and clean, the inshore waters have cooled, and the crowds that were present during the warm summer months have put away their jet skis, cruising boats and water skis. Their absence allows peace to return to the state's estuaries and coastal creeks. This is the time to fish for spotted seatrout, when they move upstream as the rivers cool and gorge themselves on fishes and shrimps prior to the winter.

There are fish that grow larger and fight harder, but there is something special about angling for trout. Fishing for trout in a creek that winds through the marsh on a cool fall morning has what the restaurant critics call "wonderful ambiance". Some restaurants make up for either unspectacular food or service by having a great view, wonderful music, or an outstanding decor. The fall is a wonderful time to be in South Carolina's estuaries and tidal creeks. A time for Mirrolures and grubs, cool weather, clear water, and a chance for peace and quiet. All these make up for the relatively small size and moderate fighting ability of spotted seatrout.

My first experience with spotted seatrout fishing was in the mid-70's in Virginia. I was still a graduate student in Marine Science at the College of William and Mary. It was the first week in May and my father-in-law asked me if I would like to try the "specs".

In the Chesapeake Bay, blue crabs move into subtidal grassbeds in early May to molt. After crabs lose their hard external shell, they are very vulnerable to predators. The "eel grass" gives them a hiding place during this dangerous period. Around high tide, large "specs" swim through the grass beds looking for soft crabs for dinner. The way to catch them was to toss a quarter of a soft crab with a piece of steel buried in it on the edge of the grass beds. I was pretty excited about the invitation because my father-in-law and his fishing friend of thirty years

had caught some "specs" in the 6 to 10 pound range the previous week.

I left our house at 3:30 am so I could reach his house by 4:00 am. The old man had to be in the water at daybreak, and if you were late, even by a few minutes, you were greeted by an icy stare and a comment like "So nice of you to make it." He was born and raised on a farm in Mathews County, Virginia and never did a thing in the morning on an empty stomach. I left the house early that day not only to get on the river at daybreak, but also to drink coffee and eat breakfast with the old man.

That day I didn't catch a fish, and honestly I can't remember if anyone did. My only memory of that morning was the smell of the kitchen when I opened the back door. You see, having been born and raised in New York, I had a deprived childhood in that I had never walked into a kitchen on a cool morning when slabs of country ham were frying with eggs, biscuits were fresh from the oven, and the coffee was hot and strong. I had always thought that ham was that soft, processed stuff (with salt, water, and a bunch of unpronounceable chemicals added) that had little or no flavor unless you loaded it up with brown sugar, cloves, and pineapple. When I opened the door, I asked him what smelled so wonderful. He looked at me like I was some strange creature and said "That's country ham, boy."

After that morning, I began a love affair with country ham; there is no doubt that cool mornings, ham biscuits, hot coffee, and trout just go together. God must have created them all at the same time when He was in a really great mood. When you eat country ham before you go trout fishing, you really don't have to worry about any cholesterol or salt because the day doesn't count anyway since every day that you spend fishing isn't subtracted from your allocated time on earth.<sup>1</sup>

I have been fishing for spotted seatrout in South Carolina since 1980, and have only become reasonably successful in the last five years. I don't claim to be an expert on the subject, and there are a number of anglers like David Yates, Joe Deytens, Sandy Stuhr, Don Broxton, Tony Mims, and Mike

<sup>1</sup> I thought and wrote about this early in the morning and the image is so vivid in my mind that my mouth couldn't stop watering.

Able who have forgotten more about trout fishing than I will ever know. What I would like to accomplish with this booklet, which is the second in a series dealing with the natural history and techniques for catching inshore fishes in South Carolina, is to introduce the interested angler to the habits of this fine fish as well as provide the novice fisherman with some general techniques that may help them catch trout.

John Archambault wrote the fishing techniques section, whereas I summarized our scientific knowledge of this fine critter. With that in mind, if you have problems catching them, blame John; I had nothing to do with that part.

There are as many ways to approach the art of trout fishing as there are successful fishermen. Neither all the techniques nor all the locales involved in the pursuit of this fine fish are included in this work. Drop me a line and let me know what you think about the booklet. If there is something that you like or don't like, tell me. There are several more of these booklets planned. They can be made more informative only if people let me know how they feel.

In my mind, fishing is more than simply catching a fish, sticking it in a cooler, cleaning it at home, and finally eating it. The following article, originally published in April 1980 in *Outdoor Life*, was subsequently reprinted in condensed form in the April 1986 issue of *Reader's Digest*. It provides another aspect of fishing that frequently we forget about.

### THE LAST RAINBOW

by Jim Berlin

The OLD MAN was still getting around pretty well. In slow motion, to be sure, with a gingerliness that bespoke the pain of terminal cancer-but getting around nevertheless. I'd taken a few days off from my job and flown to join him at the cabin, the one he'd built with his own hands when my brother Jack and I were barely tall enough to reach his waist.

The cabin. Those two words will evoke a montage of memories for as long as I live. Goldeneyes whistling down the lake, the rowboat, perch in the

pan, baby loons riding their mother's back, and rainbow trout.

This day was superb for chasing rainbows: a gentle breeze from the west, and a cloudy, somber sky, delicious with the aroma of impending rain. A day positively heavy with the promise of good fishing.

I glanced at the rods in the corner of the cabin, wondering if I should suggest it, wondering if the old man still had the strength.

"Might be a good day," he said slowly, grinning slightly, "to try the old bridge at Silver Creek."

We were there in minutes, at a spot to which he had first brought me 30 years before. In those days it was a rickety, dangerous-looking crossing fashioned from old timbers. You could look down at the creek between each plank. A rusty sign peppered with bird shot said "Cross at your own risk."

But the bridge was different this day, sadly different. The planks had been replaced with concrete. The sign was gone. The stream, however, was everything it had ever been. Cool and clear and rushing, choked with overhanging branches and moss-covered logs, a stream that sang Trout! to anyone with a lick of sense to listen.

We would fish from the little bridge today, as usual, but unlike years gone by we would not wade downstream in our hip boots, sneaking up on a dozen beautiful holes that always seemed to yield a creel of trout. Because the old man was already tired from the short ride, our fishing would begin and end at the bridge.

And it began just as we had hoped. Dad had no sooner started stripping out line when a good ten-incher darted from beneath the bank and nailed his night crawler. He played the trout as he had always played them, with a slight, patient smile on his face, the rod held gently at a 60-degree angle. He tired the fish as it flashed back and forth, then swept it with one easy motion up and into the weeds.

I unhooked the rainbow, placed it in the creel with a bit of grass, and baited his hook again. Not 30 seconds later he'd enticed another trout from the same dark patch of water.

Dad offered me the rod then, but I declined, because watching him was all the fishing I wanted. He had always said that he enjoyed watching my brother or me catch a fish just as much as he enjoyed catching one himself. That day, I understood what he meant.

The old man had exhausted the downstream hole, but we knew that the best had been saved for last. Under the bridge-that was where the best rainbows always waited. And it was right there, in fact, that I had caught my very first trout: a fat 12-incher.

I watched the tip of the old man's rod as he floated a fresh crawler toward the hole neither of us had ever really seen, but had fished a hundred times.

He stopped feeding the line just when I thought he should. Instinctively we knew the bait was precisely where it ought to be. We waited. Five seconds, maybe ten. Then it happened.

The tip of the rod twitched, twitched again, and then bent double as the trout bit down and held on, and the old man began easing the fighting fish out of the hole.

"It's a good one," he said. For that moment at least he forgot he was dying, forgot that this stream and all the streams he loved so deeply would soon be flowing past without him.

"It's a good one," he said again, and my eyes traveled up the rod to his face. The slight, patient smile was a little wider than usual.

It was good. Before it was over the old man was breathing heavily and tiring as fast as the fish. But he worked the trout out of the bridge's shadow and into the upstream light. It wasn't any record. Maybe 15 inches, but fat and thick and feisty. As good as any we'd ever taken from under the bridge at old Silver Creek.

"It was a great fishing trip," I said, putting my arm around him as we walked slowly to the car.

"Yes," he replied. "We'll do it again sometime. Sometime soon."

Several months later I traveled back home once more, this time for his funeral. I walked into his bedroom and found his fishing rod in the corner, rigged with a brand new Eagle Claw and two tiny split shot.

My mother came in and saw me holding it. "He had it all ready for another trip," she said. "He thought maybe the two of you could go fishing together one more time."

We will, old man. We will.

### THE SPECIES

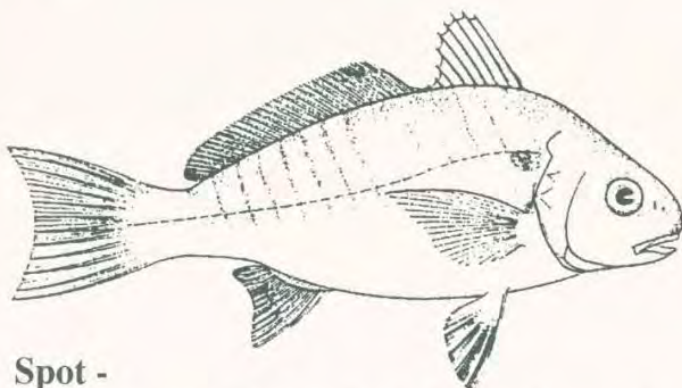
by Charlie Wenner

Our subject of this book goes by several names depending on where you are. In South Carolina, I have heard them called speckled trout, trout, or winter trout; in Virginia, they are speckled trout or simply "specs". Anglers in the shallow waters of the Gulf of Mexico refer to them as "specs". The accepted common name which has been established by the American Fisheries Society to standardize names for fishes that are found in several areas is spotted seatrout. The scientific name is *Cynoscion nebulosus* which is derived from several Greek words. *Cynoscion* is a composite of two words: *Cyno* which means dog-like and *scion* which means a sea-fish. The second name, *nebulosus*, means dark and clouded. If you put them together, you get a dark/clouded dog-like sea-fish. I guess that the resemblance to a dog comes from the presence of the two serious looking canine-like teeth on the upper jaw; I have no idea of the origin of dark and clouded.

Ichthyologists (biologists who study fishes) do not consider spotted seatrout to be a type of trout at all. Real trout are members of the salmon family (=Salmonidae), whereas spotted seatrout are members of the family Sciaenidae (=drum family) which includes many inshore species of fishes that are popular with recreational anglers along our coast (Figure 1). In South Carolina, we have three different species of seatrout: spotted seatrout (*Cynoscion nebulosus*), weakfish (=summer trout, *Cynoscion regalis*), and sand seatrout (*Cynoscion nothus*) (Figure 2).

Spotted seatrout are found along the Atlantic coast of the United States, around southern Florida, and along the coast of the Gulf of Mexico to the northeast Mexican coast. Although spotted seatrout have been caught as far north as New York, they are rare north of the Chesapeake Bay. This species has been harvested by both commercial and recreational fishermen throughout its range. Samuel F. Hildebrand and William C. Schroeder in *Fishes of the Chesapeake Bay*, which was written in 1928, state that "spotted squeteague (=spotted seatrout) was one of the most important commercial fishes

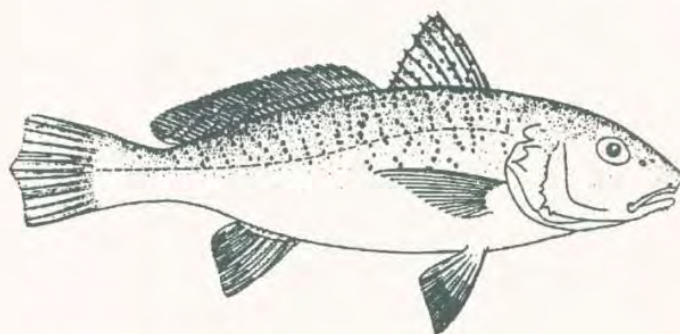
harvested in Chesapeake Bay. Because of its highly prized, firm flesh, the retail prices in both 1921 and 1922 were between 25 and 30 cents per pound." If you think of that in terms of the value of present day money, that was a very high priced fish in those days.



**Spot -**

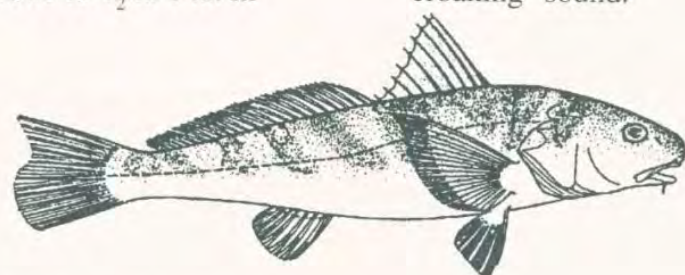
has distinctive spot on its shoulder. Highly sought after species by inshore fishermen especially in the fall during the "spot run". Grows to 1/2 to 1 lb. in weight.

In 1986, spotted seatrout was made a gamefish in South Carolina; in other states where it is found, various restrictions have been placed on its harvest to insure healthy populations. There is no doubt in my mind that, as the number of people living along the coast increases as projected in the next ten to



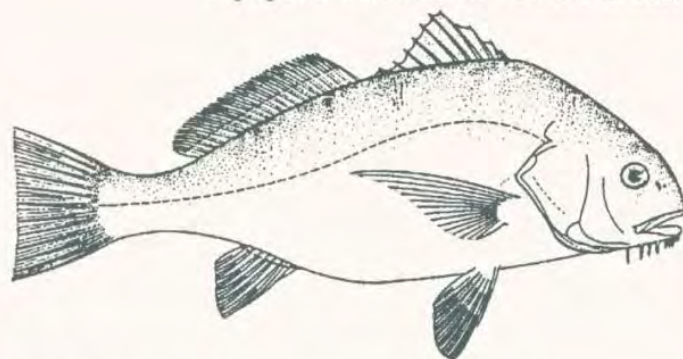
**Atlantic croaker -**

also a popular fish; common around 1/2 lb.; rare over 2 lbs. in weight. When you catch one it gives a "croaking" sound.



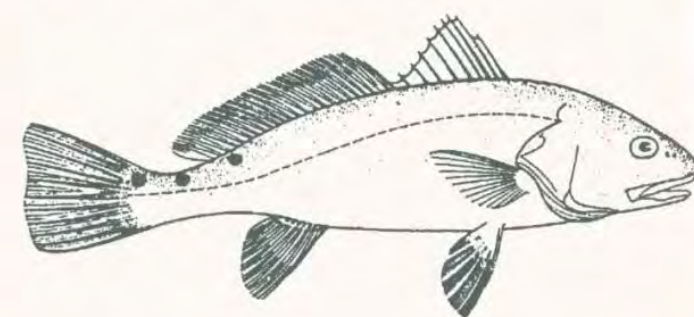
**Nothern kingfish (Whiting) -**

a popular fish in South Carolina noted for its delicate flavor. Grows to 1 to 3 lbs.



**Black drum -**

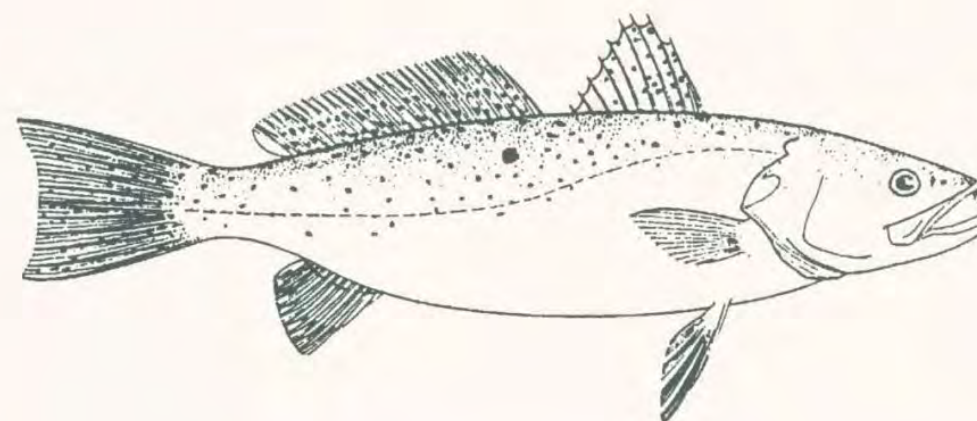
has "whiskers" under its chin. These are actually barbels with taste buds on them so that the fish can locate food. Feeds on crabs, mussels, worms and reaches 80 lbs. in weight.



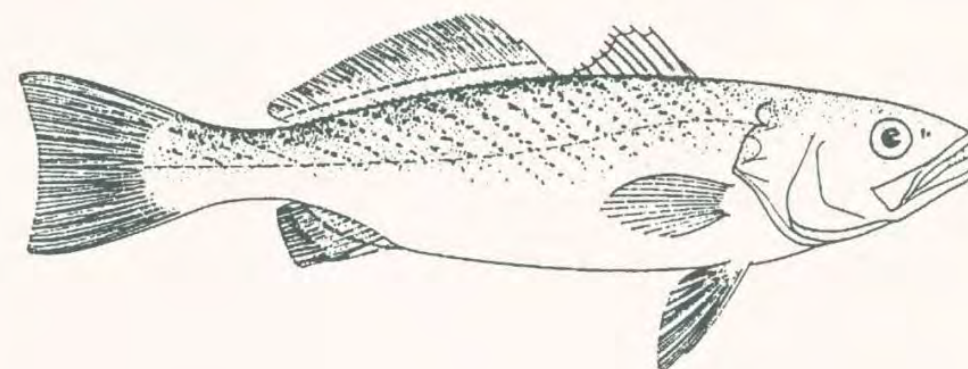
**Red drum -**

"Spottail bass" the most popular gamefish in South Carolina grows to 50+ lbs.

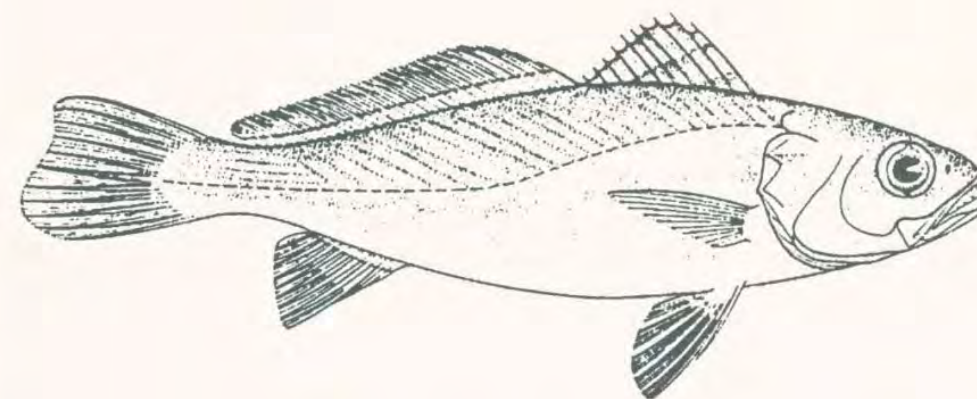
Figure 1. Some common members of the drum family (= Family Sciaenidae) found in the estuarine and nearshore waters of South Carolina.



**Spotted seatrout -** spots on body and fins



**Weakfish -** summer trout; generally has yellowish tinge on the fins; soft anal fin; rays = 11 to 13



**Silver seatrout -** small fish, fins white or silver; found mainly in the nearshore oceanic waters; soft anal fin; rays = 8 to 10

Figure 2. South Carolina's three different species of seatrout (= Cynoscion) found in the estuarine and nearshore waters.

Table 1. Salt water line class records for spotted seatrout as published by The International Game Fish Association, 300 E. Las Olas Blvd., Fort Lauderdale, Florida 33316-1616 in 1996. M = men's class; W = women's class; T = tippet class (flyrod) weight = pounds-ounces.

Line Class	Weight	Place	Date	Angler
M - 2 lb	10-1	Daytona Beach, FL	4/16/83	D.M. Fairbanks
M - 4 lb	10-12	Halifax River, FL	4/12/83	B.L. Britton
M - 8 lb	13-8	Texas City Flats, TX	11/17/84	G. Hernandez
M - 12 lb	14-0	Ponce de Leon Inlet, FL	8/10/72	A.K. Gibbens
M - 16 lb	12-8	Crystal River, FL	12/8/83	T.E. Thorpe
M - 16 lb (tie)	12-9	Ponce Island, FL	3/9/86	L.L. Nelson
M - 20 lb	17-7	Fort Pierce, FL	5/11/95	C.F. Carson
M - 30 lb	15-6	Jensen Beach, FL	5/4/69	M.J. Foremny
W - 2 lb	9-10	Texas City Flats, TX	10/27/84	V.J. Hernandez
W - 4 lb	10-6	Melbourne Beach, FL	4/10/84	B.S. Arthur
W - 8 lb	14-6	Texas City Flats, TX	11/17/84	V.J. Hernandez
W - 12 lb	12-2	Melbourne Beach, FL	5/6/86	B.S. Arthur
W - 16 lb	11-11	Melbourne Beach, FL	1/11/87	B.S. Arthur
W - 20 lb	10-9	Banana River, FL	7/12/79	J.M. Patton
W - 30	14-0	Stuart, FL	4/25/70	M.C. Albright
T - 2 lb	8-11	South Padre Is, TX	7/8/89	C. Scates
T - 4 lb	8-6	Arroyo City, TX	4/12/88	T.P. Kilgore
T - 8 lb	11-8	Banana River, FL	6/6/92	D. Chermanski
T - 12 lb	9-8	Stuart, FL	7/19/95	J. Yamora

twenty years, additional restrictions will have to be placed on the harvest to maintain the size of this species' population at levels that will insure successful reproduction. There is a limit to the number of trout that can be produced in our estuaries. As the number of anglers increase, the number of fish that each angler takes must decrease, or the condition of the state's fishery for spotted seatrout will be put in jeopardy.

Spotted seatrout usually are dark grey above with bluish reflections and numerous round black spots irregularly scattered on the back and upper sides. These "speckles" are also seen on the dorsal and caudal fins (Figure 2). As with many other fishes that move between the rivers and the ocean, the overall appearance of the fish will vary in relation to where you catch it.

Spotted seatrout caught in the ocean, in front of the barrier islands, are lighter in color and more silvery than those from the brackish waters of the river

systems where the bottom is brown and the color of the water is often like weak tea. This adjustment of general body color enables the fish to blend in better with its surrounding; it reduces the trout's visibility to both the animals that it eats as well as those that eat it.

Spotted seatrout almost never grow to 20 pounds in weight. The all tackle record documented by the International Game Fish Association (IGFA) was 16 pounds. This rather "healthy" sized trout was caught on May 27, 1977 at Mason's Beach, Virginia which is on the western shore of Chesapeake Bay. This was replaced by a 17 pound 7 ounce monster caught on May 11, 1995 at Fort Pierce, Florida. The largest fish registered in South Carolina is an 11 pound 13 ounce spotted seatrout that was caught at Murrells Inlet by A. Pendergrass in November of 1976. The IGFA line class records and tippet class records (fly rod) are presented in Table 1.

## THE JUVENILES

In the discussion of juvenile red drum in the first guidebook of this series, I explained that the shallow tidal creeks that cut through the *Spartina* marshes inside South Carolina's estuaries are the primary nursery areas for red drum. We have found that juvenile spotted seatrout also use these same creeks as nursery areas from June through November. These shallow, productive creeks are the places where juvenile red drum, spotted seatrout, flounder, shrimp, and many other species find plentiful food as well as protection from large predators.

Spotted seatrout spawn from late April-early May through the first week of September. When water temperatures are cool, spawning is delayed slightly until May; during warm springs, such as 1995, spawning begins in late April. During early evening, sexually active males and females discharge their sperm and eggs into the water. Fertilized eggs float to the surface, and hatch into larvae in about 24 to 36 hours. At first the developing lar-

vae use the yolk of the egg as a food source. When this is exhausted, they feed on very small animals in the water. At a size smaller than a quarter of an inch, they settle in the shallow creeks.

Most juveniles stay in the nursery creeks for about three months. When they reach a length of about 6 to 7 inches, the majority leave for the larger creeks or the main parts of the estuary where they form schools of similar sized individuals.

Our samples taken in the nursery habitat during September had more spotted seatrout than those from any other month (Figure 3). If you examine the sizes of the spotted seatrout from September shown in Figure 4, you will see that this month had newly spawned fishes (~1 inch in length), individuals between two and three inches long which were spawned in August, as well as larger ones (4 to 6 inches long) that were spawned during July.

As the water temperatures begin to cool rapidly in the fall, the abundance of juvenile spotted seatrout declines in the nursery creeks. We found only a handful of juveniles in our samples taken in the

Juvenile Abundance in Nursery Creeks

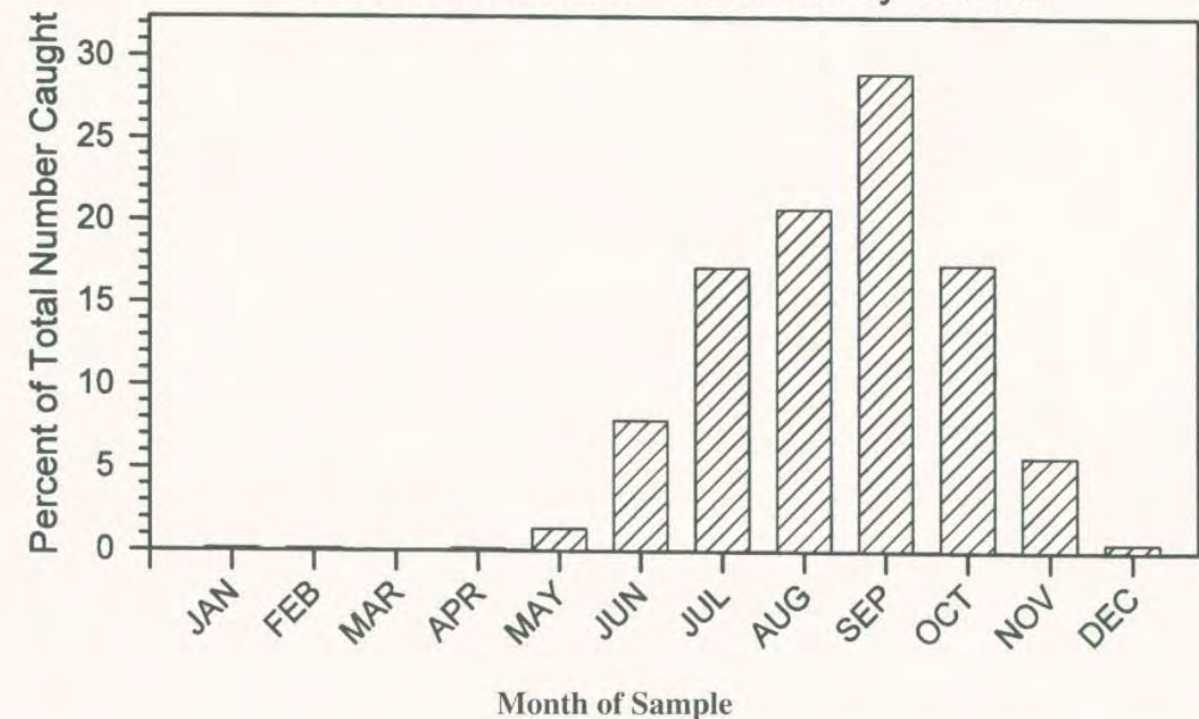
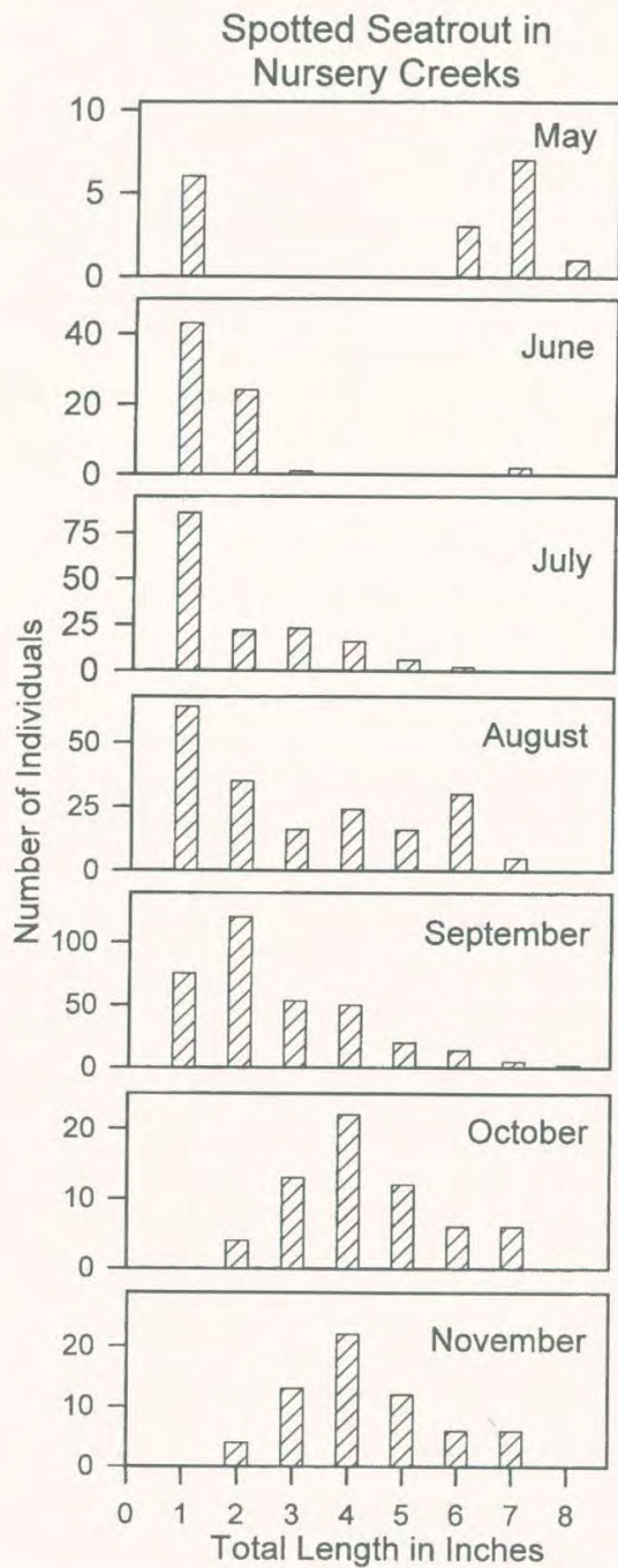


Figure 3. The abundance of juvenile spotted seatrout by month in the nursery habitat (= the shallow tidal creeks that meander through the cordgrass marshes). The number of young trout that were caught during each month was expressed as a percentage of all the juvenile trout that we caught in these creeks during our five year sampling period. Almost 80% of all the young trout that we caught were taken from July through September.



tidal creeks in December, and none in samples taken from January through April.

During the coldest months of the year (January and February), juvenile spotted seatrout (3 to 6 inches in length) were collected only in samples made with shrimp trawl nets towed in the deeper water of the channels of the main rivers and their largest tributaries. When the estuarine waters warm in March and April, these juveniles leave the deep water and form schools whose members are ravenous and grow rapidly.

The diet of spotted seatrout changes as they grow. The smallest individuals, less than one-half an inch long, feed on microscopic animals that are suspended in the water. Small crustaceans, called copepods (Figure 5), make up the greatest percentage of the diet, both in the number of food item and the volume<sup>2</sup>. These small spotted seatrout ate only a few opossum shrimp.

As young spotted seatrout grow, their swimming speed increases, so they are able to catch and eat bigger animals. In the stomachs of those fishes between one-half and 2 1/2 inches, opossum shrimp are very numerous, however, because of their small size, they contribute only a small amount to the bulk of the diet (Figure 6). Grass shrimps are not very numerous, but because of their relatively large size, they comprise a significant percentage of the bulk of

Figure 4. The length of the juvenile spotted seatrout taken in the nursery creeks is shown for each month of sampling. During May we caught a few small fish about 1 inch long as well as some larger trout that were between 6 and 8 inches in length. Those larger fish were spawned the previous year, probably in late August or early September. Note that the smallest juveniles were seen in May through September, indicating that spotted seatrout spawned through this period and batches of young were moving into the nursery each month. Also, you can follow the growth of a group of juveniles through the year. For example, the fish that were about 1 inch in May grew to 2 to 3 inches in June, 4 to 6 inches by July, 6 to 7 inches by August, and then moved out of the creeks by September. You can follow that same size progression for each batch of very small fish.

<sup>2</sup> When biologists examine what fishes eat to determine what plants and animals are important in the diet, they count the number of each item and then measure its volume. A fish may eat numerous small items, but their bulk might not equal one big fish or shrimp.

### Foods for Spotted Seatrout <math><1/2</math> inch in length

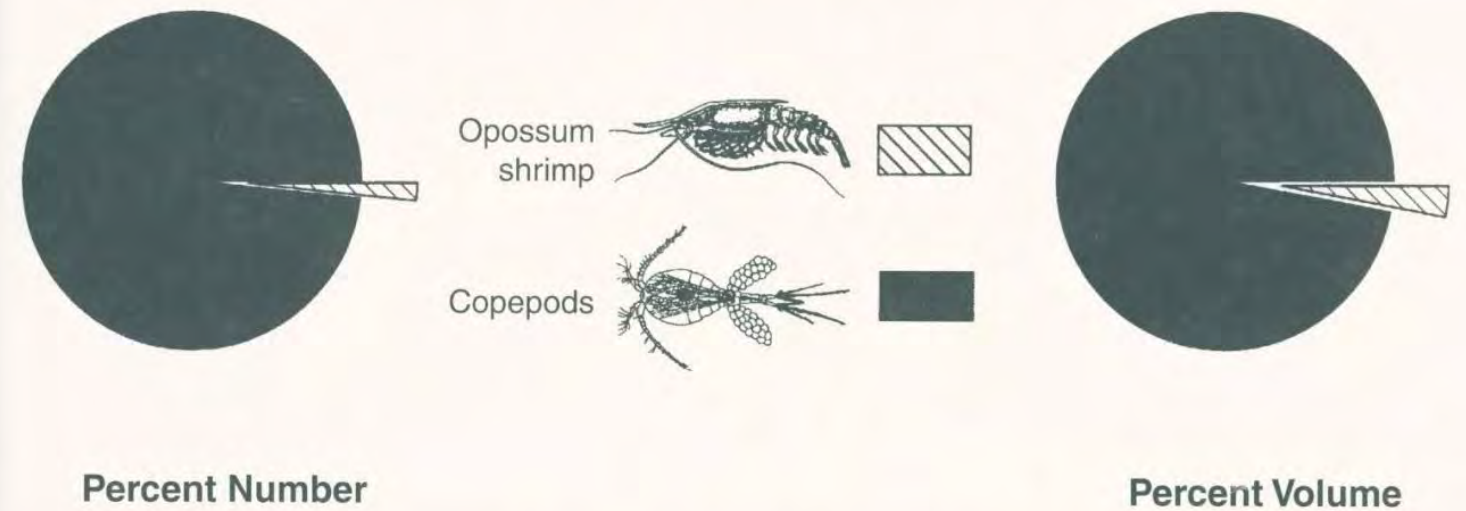


Figure 5. Foods of spotted seatrout which were less than one-half an inch in length. Copepods, which are small animals that are distantly related to crabs and shrimp, were the most numerous item in the diet, and contributed the greatest bulk.

### Foods for Spotted Seatrout 1/2 to 2 1/2 inches in length

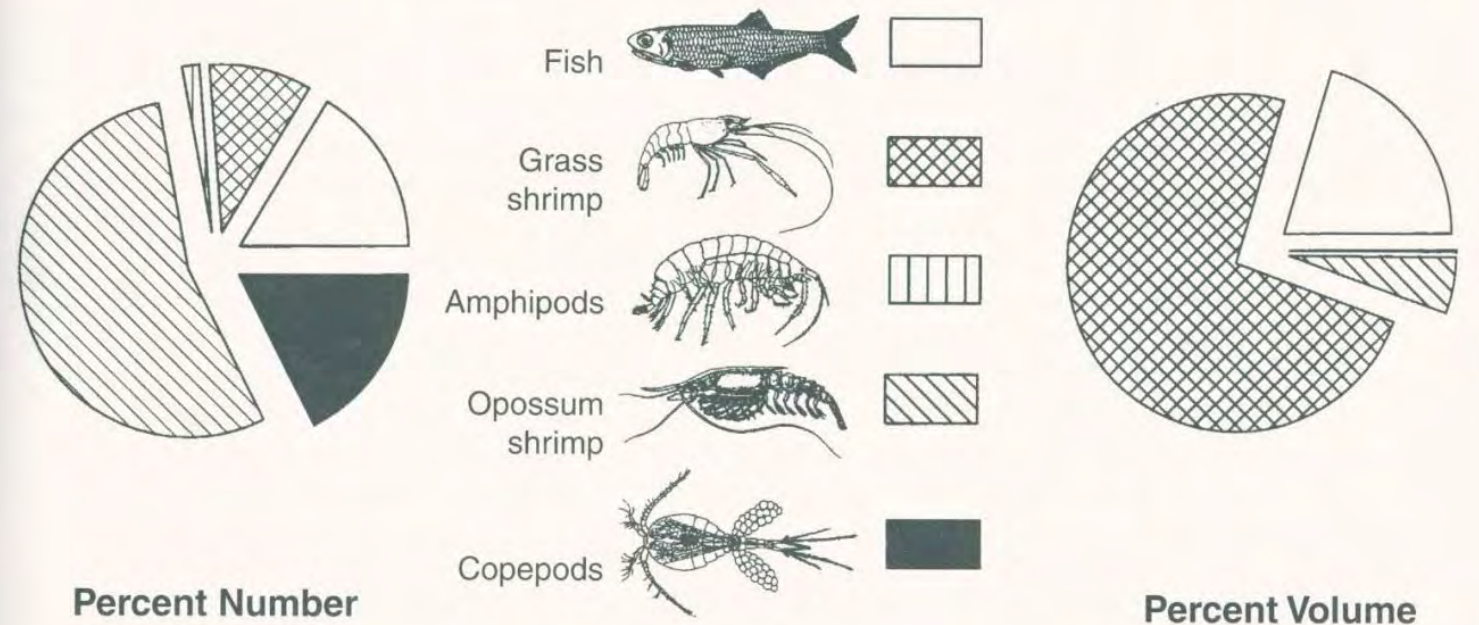


Figure 6. Foods of spotted seatrout which were one-half to 2 1/2 inches long. Although grass shrimps contributed only about 15% to the total number of food items eaten by the young trout, they made up about 70% of the volume of food because of their large size relative to other things eaten. This would be analogous to a man who sat down to a dinner of steak and peas; the peas would be the most numerous item eaten, but the steak would make up most of the bulk or volume of food in the man's stomach. For this size juvenile trout, the opossum shrimp would be the peas, and the grass shrimps would be the steak.



### Foods for Spotted Seatrout 2½ to 6 inches in length

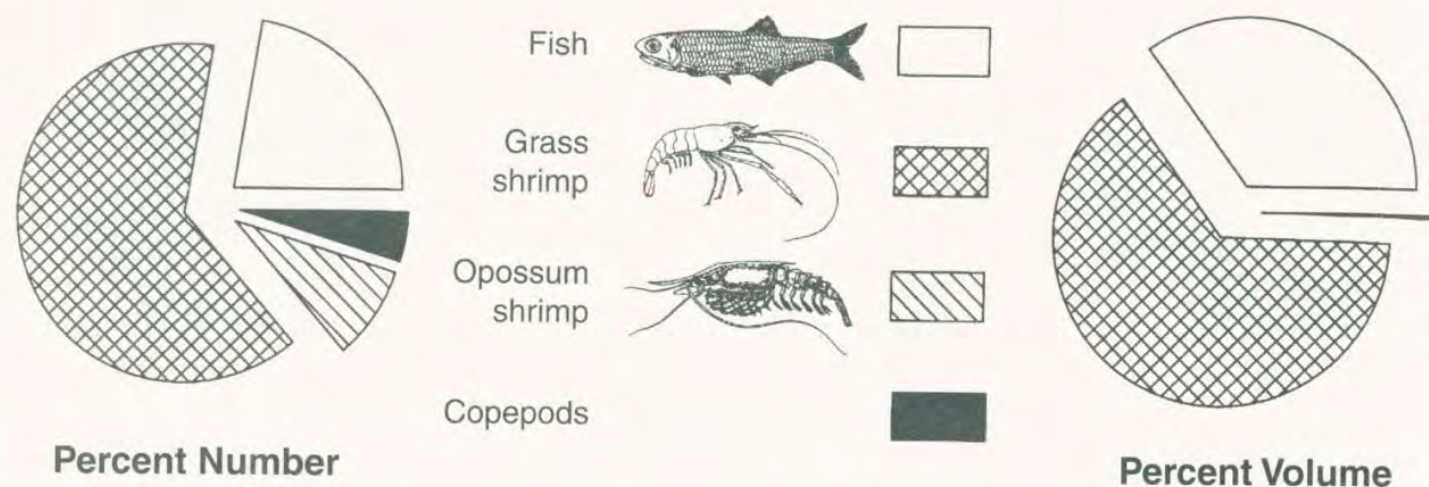


Figure 7. Foods of juvenile spotted seatrout which were 2½ to 6 inches in length. Fishes and grass shrimps were the most important foods of spotted seatrout in this size range.

food. Small fishes, mostly juvenile spot and mummichogs (mud-minnows) are also eaten. Spotted seatrout juveniles 2.5 to 6 inches in length mainly eat fishes and grass shrimp (Figure 7). These two groups accounted for 86% of the number and 99% of the volume of food eaten by this size group.

### THE ADULTS

Spotted seatrout become sexually mature when they are about one year old. The smallest mature males that we have observed were about 9 inches in length and the smallest mature females were about 10 inches long. As I mentioned in the previous section, the spawning season extends from late April through early September.

When we first began our studies of spotted seatrout in South Carolina's waters, we believed that spotted seatrout spawned around the inlets and along the front beaches of the barrier islands. Several scientists had written articles describing the presence of very small spotted seatrout in samples of larval fishes taken outside inlets.

They concluded that the mature trout move to these areas to spawn, and the presence of fertilized eggs and very young fish in those areas confirmed their beliefs. It is generally assumed that the spawning area of a species is located near where

you catch the eggs and smallest larvae. We later learned that this was not the case.

In the wild, fishes use "environmental cues" such as changes in water temperature and photoperiod (day-length) to ensure that both males and females are ready for the spawning season. The increases in day-length and water temperature in the spring provide signals to spotted seatrout that the reproductive period is approaching. In males not only do the testis become active and produce the cells that will eventually mature as sperm, but also, muscles that are found in the lining of the gut cavity adjacent to the swim bladder increase in size and the blood vessels become more developed.

The young eggs in the ovaries of the female increase in diameter as they start to mature. The size and weight of the ovaries become greater as the spawning season approaches (Figure 8). The ovaries in older, larger spotted seatrout contribute a greater percentage of the total weight of the animal than in smaller females (Figure 9). This essentially means that age 2 and older females contribute more eggs per unit of body weight than the one year-old, first maturing females.

The endpoint of the maturation process, spawning, takes place shortly after dusk in aggregations of reproductively active trout at specific locations that are used consistently from year to year. Around

### Female Spotted Seatrout - Maturity Index

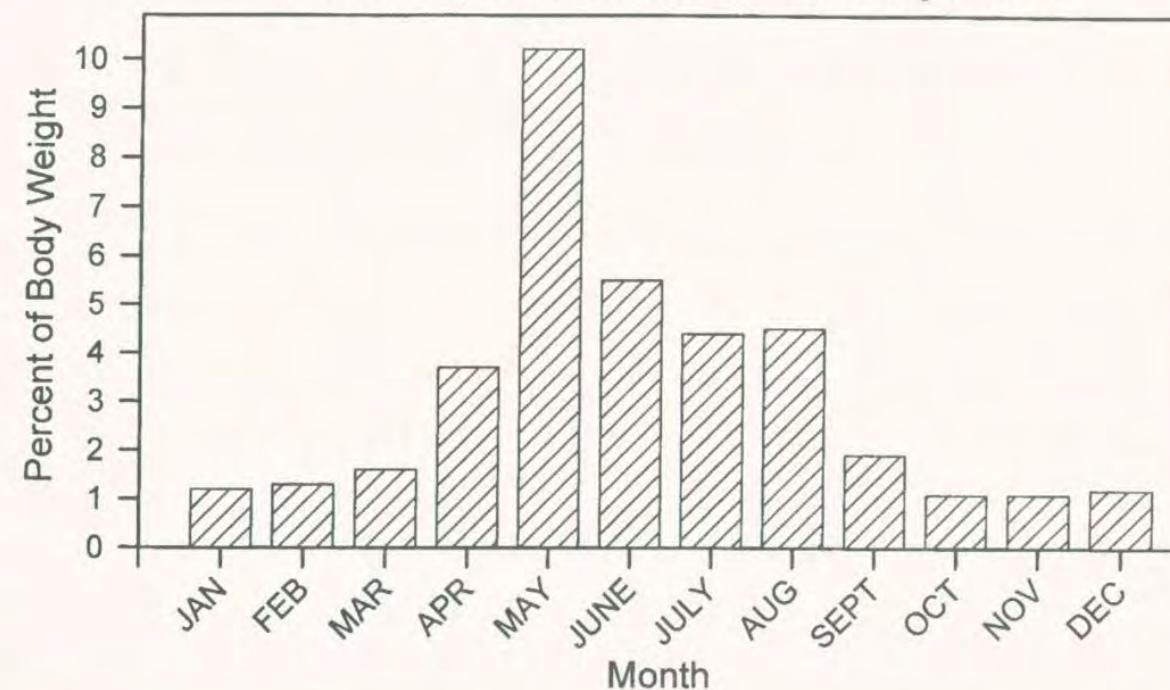


Figure 8. The maturity index of spotted seatrout shown for each month. The maturity index is the percent contribution of the weight of the ovaries to the total weight of the fish. As the spawning season approached, the ovaries begin to enlarge and weigh more. After the spawning season, the ovaries go into what biologists call a resting state. The figure shows when the ovaries were most active during the year. In this case, fishes taken from April to September had the heaviest ovaries. This period was during the spawning season.

dusk during the spawning season, mature males contract the muscles near the swimbladder which causes it to vibrate like a drum. If you have ever caught a spotted seatrout that drums as you hold it, that fish was a male.<sup>3</sup> During the spawning season, this drumming activity attracts the sexually active females to areas where the males are aggregated. The drumming sounds continue from around dusk to around midnight when spawning activity ceases.

We have studied this sequence of events by eavesdropping on the fishes during the spawning times with an underwater microphone, called a hydrophone. The hydrophone basically converts the sounds made by the fishes and other organisms in the water to not only sounds that we can hear but also into electrical impulses that we can record and

measure.

Sound production in fishes is what scientists call species specific. This means that each different type of fish produces a sound that has a pattern found only in that species. We can determine the kind of fish producing a sound much like we can identify people by their voice.

We conducted this study in an attempt to answer the following questions about the spawning habits of this species: what was the extent of the spawning season; what time during the day or night did the fish produce the most sound which was an indication of the greatest spawning activity; where did they spawn and were these places consistently used each year?<sup>4</sup>

A series of listening sites were established from

<sup>3</sup> These muscles are found in all members of the drum family in South Carolina waters. Indeed, this is where the common name for this family of fishes is derived.

<sup>4</sup> Funding for this study of sound production in fishes was provided by the Charleston Harbor Project which was supported by the National Oceanic and Atmospheric Administration through a grant to the South Carolina Department of Health and Environmental Control, and by monies derived from the Fishing Stamp.

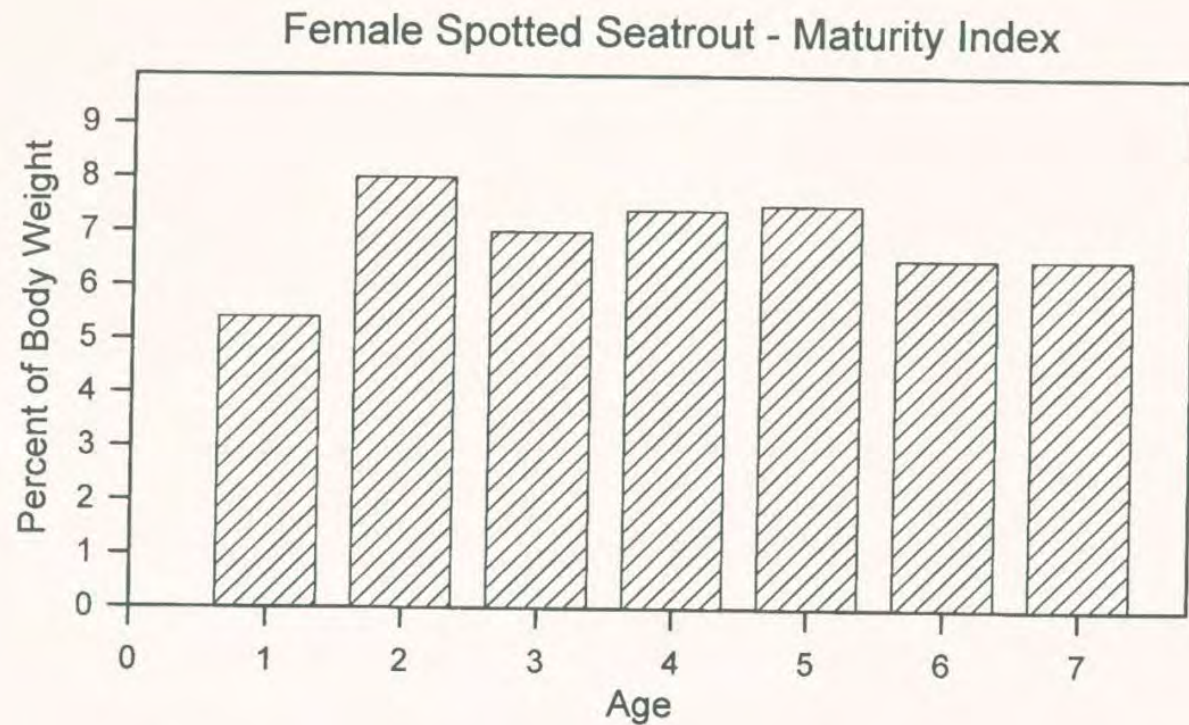


Figure 9. The average maturity index of spotted seatrout for each age during the main part of the spawning season (May-August). The one year old fish had the smallest ovaries in relation to their total body weight. Age 2 fish had the highest, and the remaining ages all showed similar indices. Fish age 2 and older contribute more to spawning, i.e., produce more eggs, per pound than do age 1 fish.

the nearshore waters outside the jetties, to 10 nautical miles up the river systems which drain into the Charleston Harbor estuary. We found that spotted seatrout produce sounds from near dusk to just shortly before midnight at the same locations each year from late April-early May through early September.

Although you can hear sounds produced by the males more or less at random through the estuary from dusk until midnight, major spawning aggregations were characteristically found in specific areas. We could tell that these were major spawning groups because of the intensity of the sounds being produced by the males.

In the Charleston Harbor estuary, the main spawning sites are shown in Figure 10. We know that the fish in these locations were involved in spawning because we dropped a short section of gill net at some of the sites to sample the animals there. Our catches were comprised of small numbers

of males that were discharging milt (sperm) and females with abdomens that were swollen due to the large number of clear eggs.<sup>5</sup>

One interesting finding was that the fish do not spawn in the coastal waters along the front beaches or at the inlets where we had previously thought. Biologists had captured spotted seatrout eggs and small larvae in waters just outside the inlets. They had assumed that the fish had spawned nearby, however, they failed to take into account the effect of tides on the distribution of eggs.

In South Carolina we have a reasonably significant tidal range (~6 feet), and anyone who has spent much time on the water knows the strength of our tidal currents. If a spotted seatrout spawns off Fort Johnson in the lower Charleston Harbor during a strong ebb tide (current velocity about 4 knots), after two hours the eggs (which float to the surface when fertilized) could be transported as far as 8 to 10 miles from the spawning site. Our findings,

<sup>5</sup> Biologists call these clear eggs in the ovaries of the females 'hydrated oocytes' and they are an indication that the fish is either spawning or about to spawn.

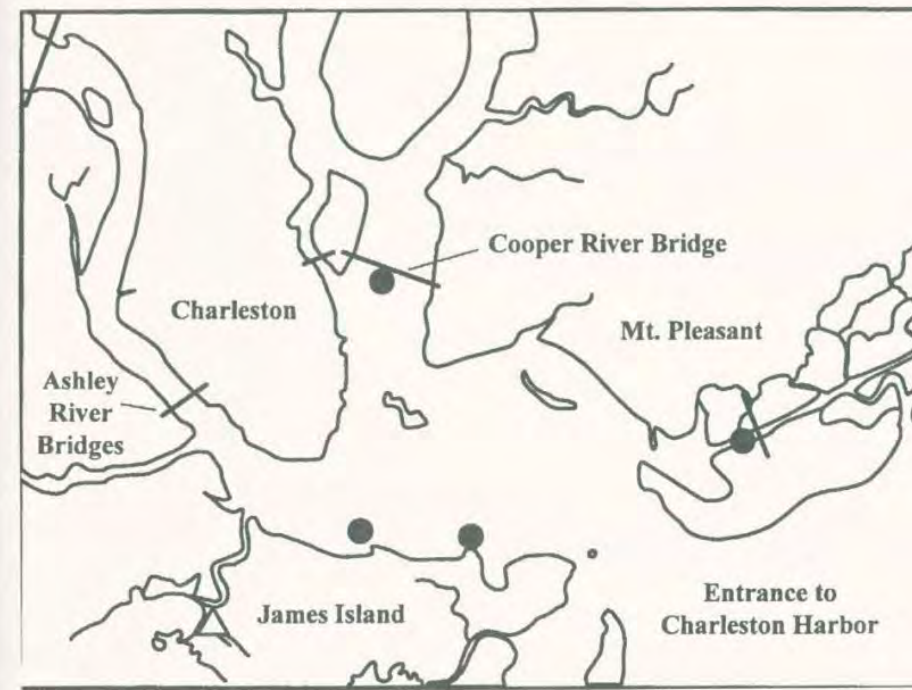


Figure 10. Locations of the main known spawning sites of spotted seatrout in the Charleston Harbor estuarine system. The location of these spawning areas were consistent from year to year. These sites were located by listening to the grunting noises of the sexually active males in the evening during the spawning season.

though, suggest that the stage of the tide does not control spawning; spotted seatrout spawn at night throughout the season when they are ready to spawn regardless of the tidal stage.

In order to study populations, whether they are human or fish, we need to know the ages of the members and their distribution in the population of concern. By looking at the changes in the distribution of ages with time, you can get some idea of death rates, longevity, and so forth.

To age fishes we examine the rings deposited yearly on their earbones (otoliths to biologists). This activity is similar to what foresters do to get an idea of the age of a pine tree. Since fishes are cold-blooded, (they are unable to regulate their body temperature to the most favorable levels) when the water gets cold in the winter, their growth rate slows or stops. When the water warms in the spring, growth rates increase dramatically.

Each time a fish passes through this annual temperature cycle, a ring is deposited on the bones much like the growth rings found on a pine tree. This signifies the fish has passed through periods of fast and slow growth.

When we examine a spotted seatrout, we take the earbones from the animal (these are found in the skull under the brain), and cut a wafer from their center. This is laid on its side and viewed under a microscope. Rings which signal a major change

in growth rate can be seen on the bones in late April and early May, and by counting them we can estimate the age of the fish (Figure 11). The oldest spotted seatrout that we have sampled in South Carolina was a nine year old female.

Males grow more slowly than females (Figure 12). For example, the average length of age 3 females is 18.5 inches in May, whereas the average length of males of the same age is 15.5 inches. The differences between the average weights of males and females of the same age are even more dramatic. For example, at three years of age, the average male weighs about 1 pound 5 oz. whereas an average female weighs 2 pounds 4 oz. The average three year old female is almost a pound heavier than a male (Figure 13).

A chart that can be used to estimate the weight of a spotted seatrout of a given length is depicted in Figure 14. This type of chart is used by biologists to estimate the weights of fishes when only length measurements are available. Each species has its own curve that relates length to weight.

As spotted seatrout grow, other species of fishes become more important as food. The diet of trout between 6 and 12 inches long has three important components: penaeid shrimp (white, brown and pink shrimp), grass shrimp, and fishes (Figure 15).

In this size group of fish, other fishes make up over half of the bulk of the diet, and grass shrimps

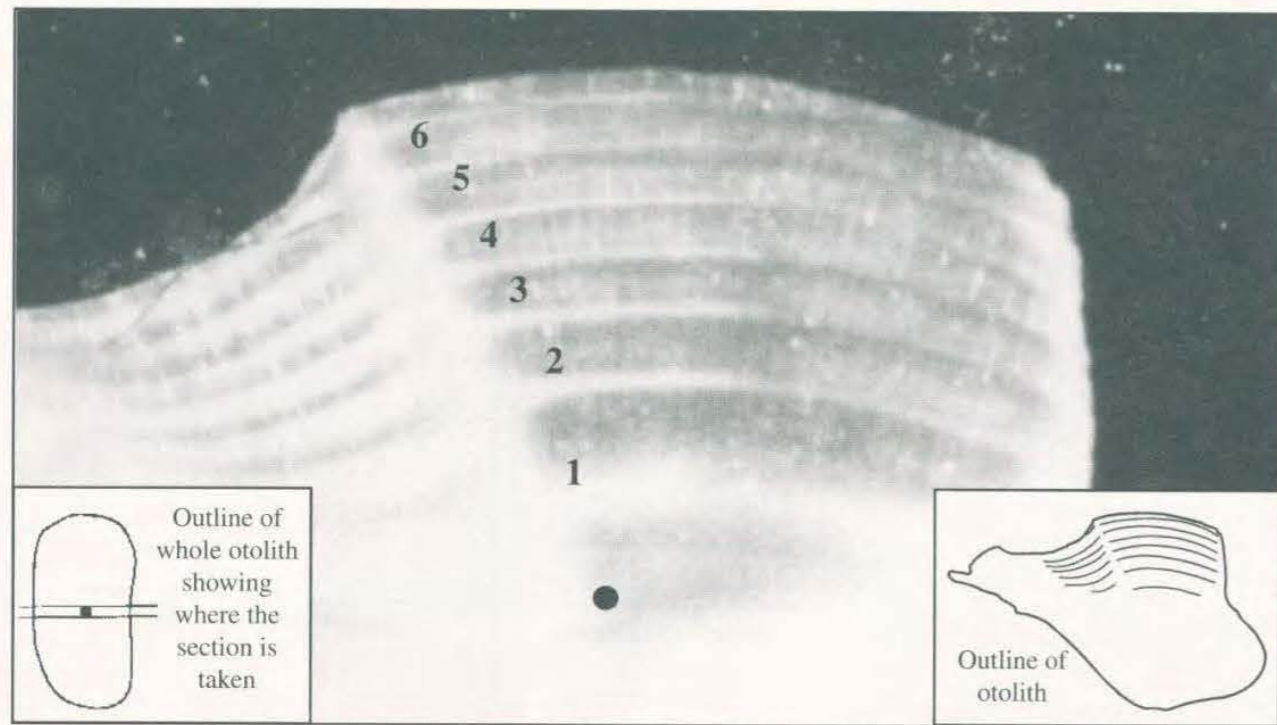


Figure 11. Photograph of cross-section of otolith from spotted seatrout. Insert on the left shows the outline of the whole otolith and the location of the slice. The bone is about  $\frac{3}{4}$  to 1 inch long and  $\frac{1}{4}$  inch wide. The above section shows this trout has passed through 6 winters. This female weighed five pounds and was 24 inches long.

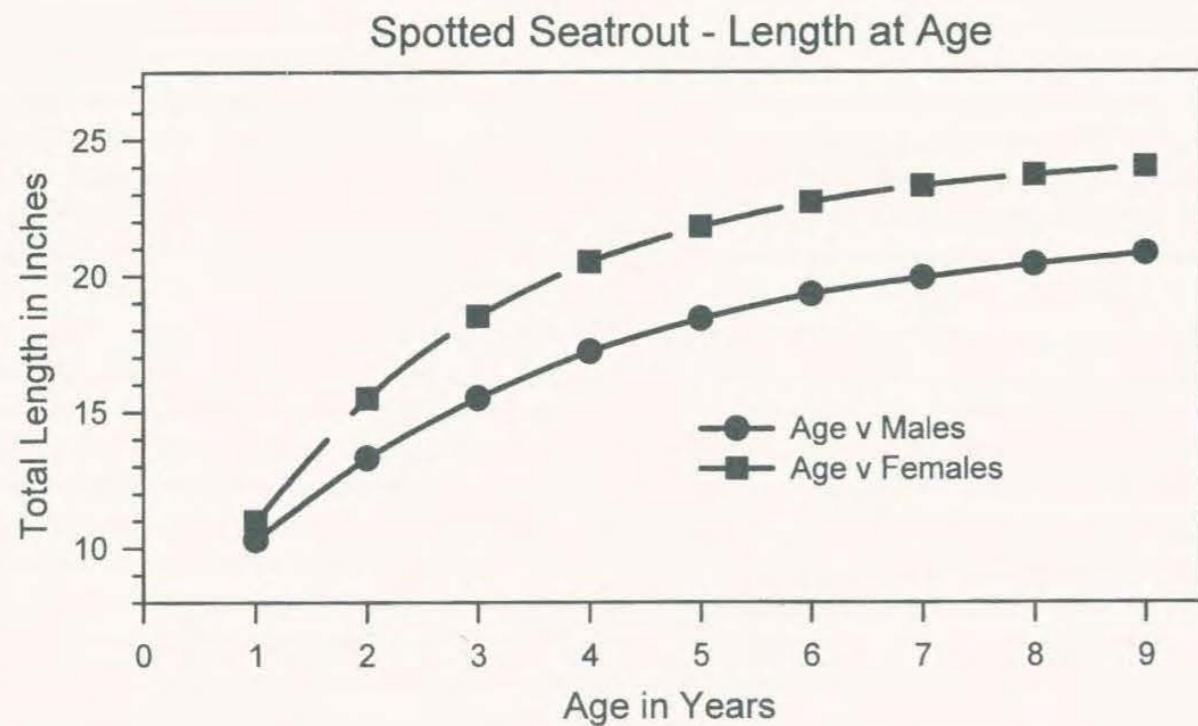


Figure 12. Comparison of the length of males and females for each age during May. These values are for 'average' males and females in each age class. Note that after age one, females are considerably larger than males at the same age. Females reach a larger ultimate size and grow faster during the first three years of life than males.

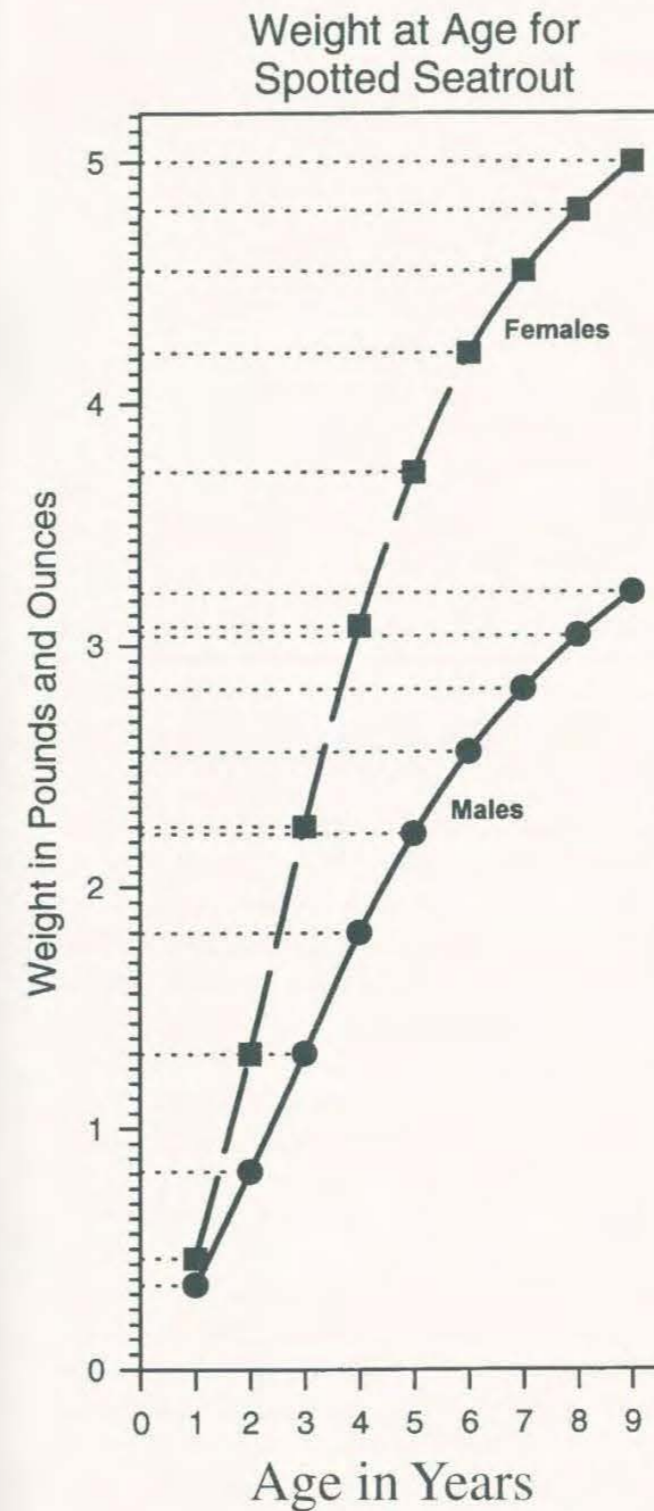


Figure 13. Comparison of the weight of males and females for each age during May. Once again, these values are for 'average' males and females in each age class. At age 1, the weights of the two sexes are quite close. The difference in the weight at a given age between the two sexes gets larger as they age. For example, a five year old female is almost twice as heavy as a five year old male, which is the same weight as a three year old female.

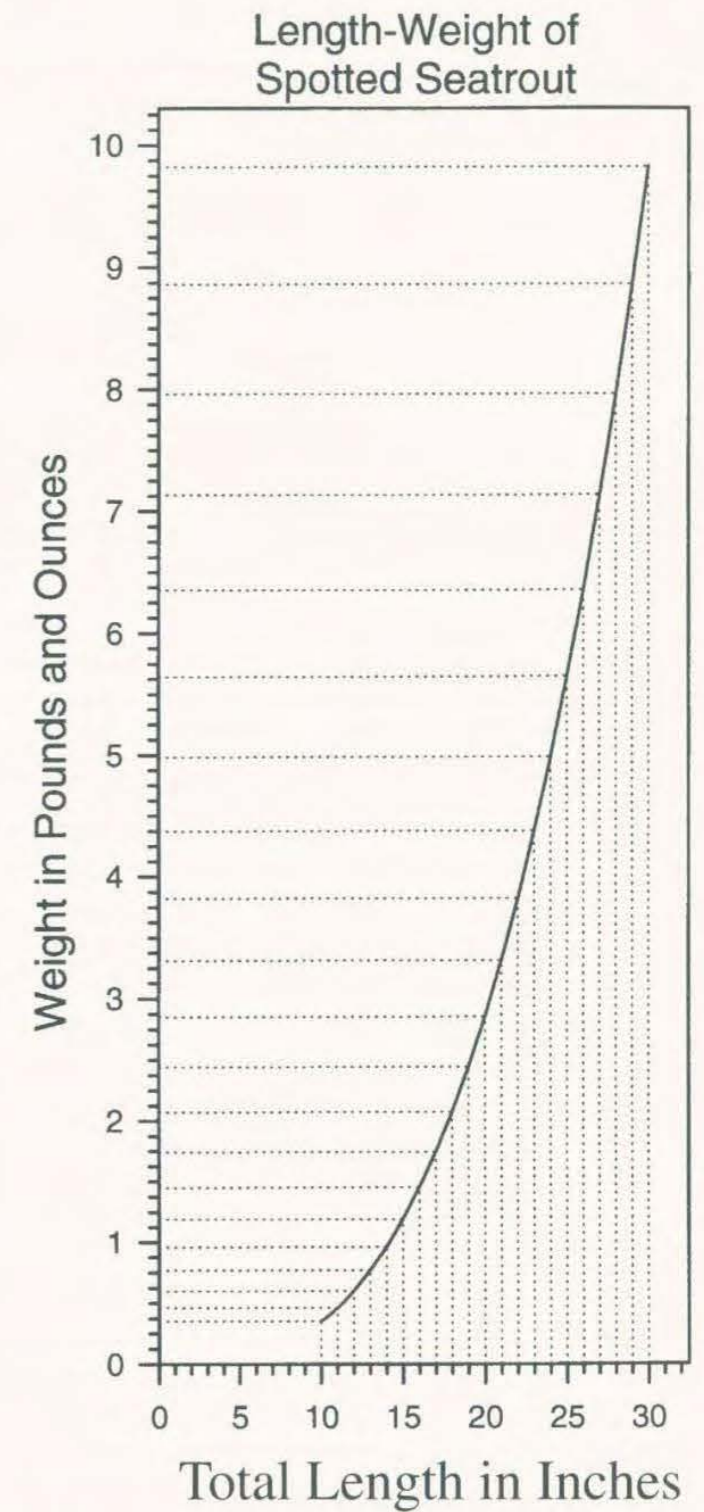


Figure 14. A curve to convert the length of a spotted seatrout to its weight. For example, to estimate the weight of a 20 inch fish, go to 20 on the bottom axis. Follow the dashed line to the solid curve, and then follow the dashed line to left. It intersects the vertical axis at two pounds 14 ounces. Each small division on the left axis represents 2 ounces. For any given length, fishes will have a range of weights; the values on the figure represent the average of these.

### Foods for Spotted Seatrout 6 to 12 inches in length

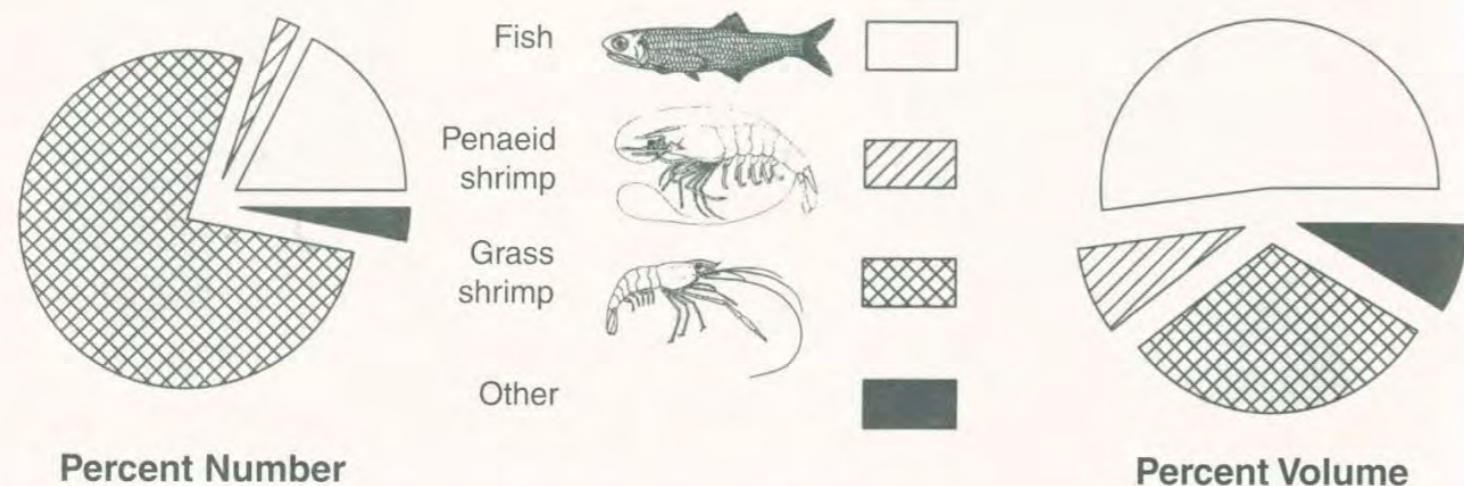


Figure 15. Foods of spotted seatrout between 6 and twelve inches in length. Fishes made up about a quarter of the number of items eaten, and about half the volume. These fishes were mummichogs (mud minnows), small spots and anchovies. The penaeid shrimps were much less important than the grass shrimps which made up about three-quarters of the number of food items and about 35% of the volume.

make up another 30%. The penaeid shrimps are a relatively minor component of the diets of these trout, both in the number and their volume. With increased size between 12 and 18 inches total length, the same pattern holds (Figure 16). Penaeid shrimps are a small component, and fishes and grass shrimp are more important.

Finally, in trout over 18 inches in length, fishes dominate the diet (Figure 17). The biggest contributors to the diet are Atlantic menhaden, spot, striped mullet and mummichogs (mud minnows).

One of the most widely used and successful baits in the recreational fishery for spotted seatrout is live shrimp. These are the penaeid shrimp such as the white, pink or brown shrimp which are so well prized at the dinner table in our state. However, these shrimp are not a significant food item in the wild.

The grass shrimps (these are the rather small, clear shrimp that you see at low tide in the shallow creeks that cut through our marshes) are far more important as food for spotted seatrout. One reason why this is the case is that the grass shrimp are so much more abundant than the penaeid shrimp, and generally, fishes eat what is available and easiest to capture.

If the fish that swims into the wrong spot at the

wrong time happens to be a spotted seatrout, that fish is history since spotted seatrout are cannibals. We found small spotted seatrout in the stomachs from all of the three larger size groups. Also, large spotted seatrout consume young-of-year red drum in small numbers.

In general, the animals eaten by spotted seatrout are found along the edges of the marsh grass as well as in the shallow tidal creeks, and as they grow, they eat more, and bigger fish.

From June of 1986 through December 1993, our project tagged and released 6,284 spotted seatrout at various locations throughout the state. Anglers reported catching 604 of these tagged fishes of which 43 fish were re-released and 561 were harvested (8.93%).

Only a very small percentage of the tagged spotted seatrout that were captured by anglers (0.5%) were caught on the same day we marked and released the fish. About 57% of the spotted seatrout were caught within the first six months after tagging (Figure 18). Over 15% of the tags came from individuals that had been at large for over a year, and the longest time between tagging and harvest was 1,140 days or 38 months (3+ years).

When interpreting these findings, one must remember that these figures do not include any estimate

### Foods for Spotted Seatrout 12 to 18 inches in length

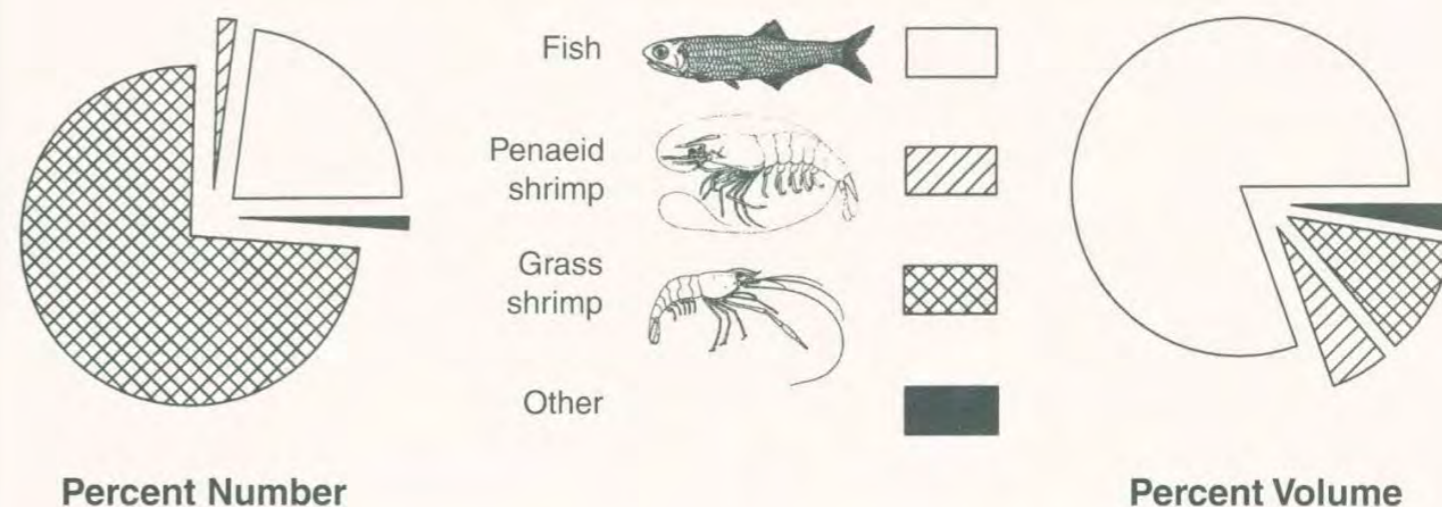


Figure 16. Foods of spotted seatrout between 12 and 18 inches in length. Fishes made up about 25% of the number of items consumed, and over three-quarters of the volume. Grass shrimps were the most frequently seen food, however, they contributed only a small volume. The main fishes eaten by this size trout were menhaden, finger mullets, mummichogs, and spots.

### Foods for Spotted Seatrout 18 inches long and larger

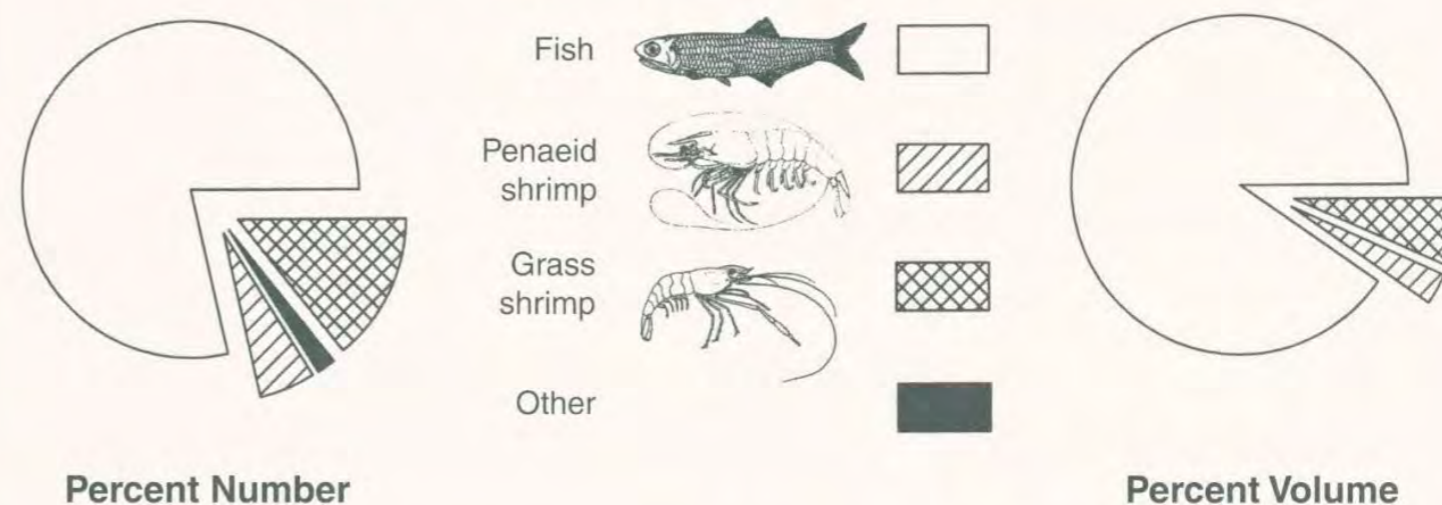


Figure 17. Foods of spotted seatrout greater than 18 inches in length. These larger fish mainly ate fishes including menhaden, finger mullets, mud minnows and spots.

of the non-reporting rate, i.e., those fishermen who caught a tagged fish and failed to notify the Department of Natural Resources.

Few spotted seatrout moved between major estuarine systems. The location of capture of most fish reported by recreational anglers (71.2%) was

less than 5 miles from the place where the trout was originally marked and released (Figure 19). Distances greater than 10 miles were covered by 14.7% of the fish, however, a great deal of this movement was up and down an estuarine system rather than between systems.

### Spotted Seatrout - Months at Large

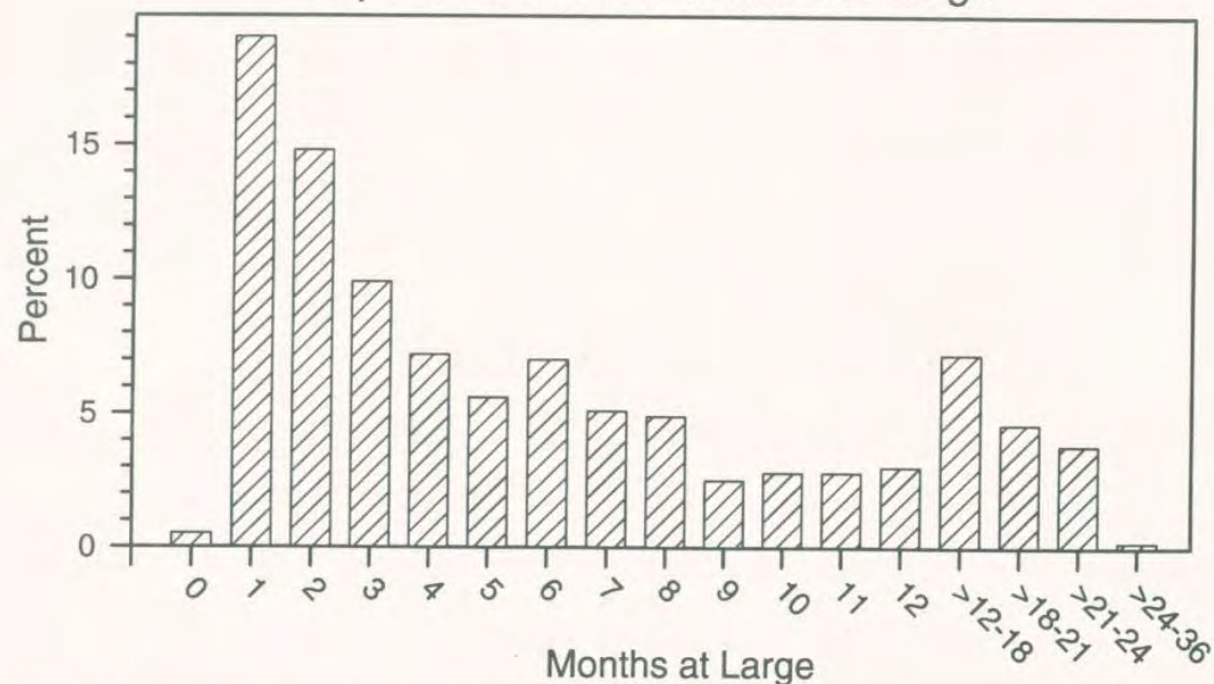


Figure 18. The months at large (= the amount of time that a tagged spotted seatrout spent swimming around before it was harvested). About 50% of the tagged fishes were harvested in five months or less. Almost 4% of these trout were at large for more than 21 months.

For example, when we examined the movements of 84 spotted seatrout that moved over 10 miles from the point of tagging, only 22 fishes were caught in different estuarine systems or in other regions of the South Atlantic coast. Of 56 individuals that were tagged in the lower part of Charleston Harbor and moved over 10 miles, one was recaptured in the Ashley River, 29 in the Cooper River as far inland as Bushy Park, 12 in the Wando River as far inland as Paradise Island boat landing, 13 in the Intracoastal Waterway south of the harbor, and one in the Intracoastal Waterway north of Charleston.

These movements were largely seasonal events with fish moving down river to the spawning areas in the lower parts of the estuaries where they were tagged during the spring, and up-river as the waters cooled in the fall to the locations where many of them were caught by recreational anglers. Incidentally, the fall fishery (October through December) for spotted seatrout accounted for 45.1% of all the tags returned during the tagging study (Figure 20).

The longest distance moved by a spotted seatrout in our study was 125.0 miles. This 12.5 inch trout was tagged on 17 August 1989 in Bulls Bay and was captured 79 days later in Sapelo Island Inlet in Georgia. Although this is quite interesting that a trout can move that distance, the important thing to remember is that those that do comprise a very small percentage of the population. The very great majority of spotted seatrout remain in a given drainage basin. These findings closely resemble those found in the 1994 summary of the cooperative marine gamefish tagging program<sup>6</sup>, i.e., little movement between systems.

What does this mean to a recreational angler? Essentially, as the fishing pressure increases in a given system, the abundance of spotted seatrout in this system will decrease and the quality of angling will be diminished. Other less heavily fished areas will not be as impacted as those which are surrounded by major human population centers.

<sup>6</sup> see Davy, Kay B. 1994. South Carolina Marine Gamefish Tagging Program 1974-1992. SC Marine Resources Center Technical Report Number 83, 66 pages plus large appendix. Copies available from SCDNR.

### Movement of Tagged Spotted Seatrout

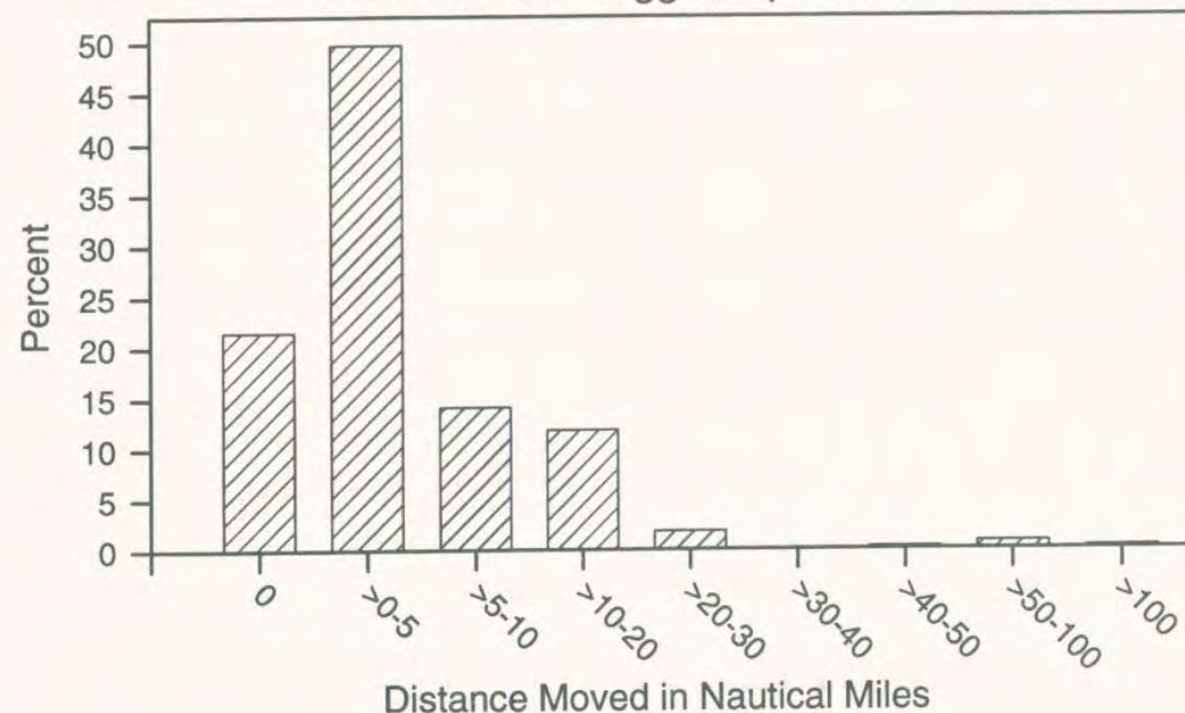


Figure 19. The distance moved from the point of capture, tagging, and release, to where the trout was harvested expressed as a percent of all fish tagged and harvested by anglers. Over 20% were retaken in the same general area, and almost half of the trout moved less than 5 nautical miles. Very few marked fish moved any great distance.

### Returns of Tags by Month

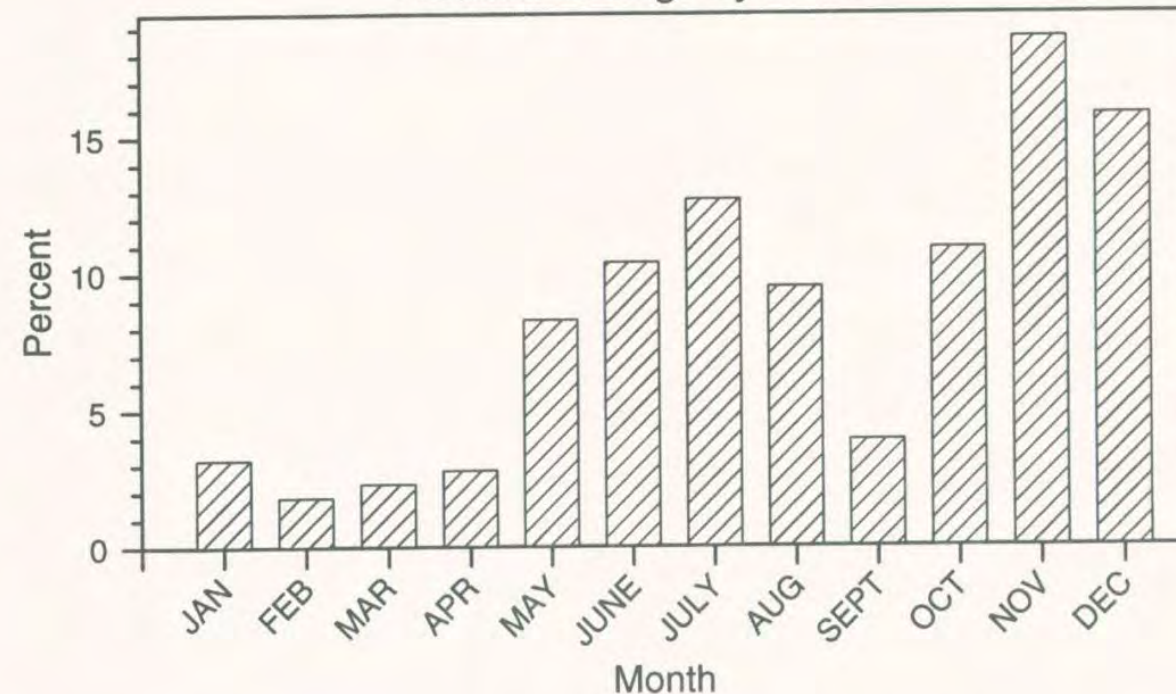


Figure 20. The return of tags by recreational anglers from marked spotted seatrout that were caught during recreational fishing by month shown as a percentage of all recaptured and reported fishes. Only about 10% of the tags were from fish caught during the first four months of the year. The greatest number of returns was a result of the fall fishery for spotted seatrout when they form schools prior to the winter.

## THE FISHERY

On July 1, 1986, spotted seatrout were declared a gamefish in South Carolina. At that time a 12 inch minimum size was placed on fish retained by anglers as well as a 25 fish per angler per day catch limit. Through time, the catch limit has decreased to 15 fish per angler per day. Legally, spotted seatrout may only be harvested by hook and line (all year round) or by gig (in all months with the exception of December through February).

The Marine Division of the South Carolina Department of Natural Resources and the National Marine Fisheries Service have been monitoring the recreational fishery in a detailed fashion since 1985. Creel clerks have interviewed anglers at access points throughout the state to determine which species are caught, the lengths and weight of the catch, and fishing characteristics, such as the number of anglers, the time fished, location, place of origin for the fishermen, etc.

The survey is called the Marine Recreational Fishery Statistical Survey or MRFSS, and its goal is to provide an estimate of the recreational harvest and the level of angler participation. A summary report of each year's catch by recreational anglers is published by the National Marine Fisheries Service. Included in this report are estimates of the total catch of a species, the total number landed, the number released, and the weight of the harvest.

In addition, creel clerks measure the samples of the catch at the landing or dockside, and from that information the sizes of the individual fishes that make up the harvest can be reconstructed. The survey also records the number of anglers who fish from the shore, fishing piers, private boats, and charter boats.

The state and federal surveys described above are the only sources of data we have on the actual fishery itself. Biologists call this type of information "fishery dependent data", that is, the information results from the activities of anglers.

The other major source of information comes from surveys that scientists conduct to measure the abundance of spotted seatrout in various areas each year. These are termed "fishery independent" data, that is, the information is collected by methods that

do not rely on the activities of recreational anglers. For example, in South Carolina we conduct monthly trammel net (a trammel net is a specialized gill net) sampling to monitor the abundance and size of spotted seatrout, red drum, southern flounder, and other less sought-after species.

The fishery independent information gives us another check on the status and trends of our in-shore populations of recreational fishes. The fishery dependent data provides estimates for the entire state, but does not provide sufficient information to compare different estuaries in the state. The fishery independent sampling allows us to specifically target our effort in areas where we really need the information.

The estimated total catch for spotted seatrout in our state has averaged 266,000 individuals per year over the past eleven years. The highest catches were seen in 1986, and the lowest occurred in 1984 (Figure 21). For that same period, recreational anglers released an average of 66,800 spotted seatrout. That figure translates into approximately 20% of the total number caught each year, so that for every 10 spotted seatrout caught in the fishery, 2 were released and 8 were harvested. This is a result of not only the minimum legal size limit of 12 inches and the 15 fish per angler per day bag limit, but also because some anglers do not harvest any fishes less than 14 inches in length and others retain only enough fish for supper.

Some fishermen have raised the concern that the catch and subsequent release of undersized individuals results in a waste of fish because almost all of the released fish die. The information we have, however, shows this not to be the case. Studies in Texas and other states have shown that about three-quarters of the spotted seatrout that were caught and released by recreational anglers survive.

When water temperatures are cool, released fish have even a greater chance of surviving capture and release. Since most spotted seatrout are caught in the fall, the chances of them surviving the encounter with a recreational angler are quite good. If 75% of them make it after being caught, the release of these small fish will make a difference.<sup>7</sup>

Previously, we pointed out that during the interviews of recreational fishermen following their

### Total Landings of Spotted Seatrout

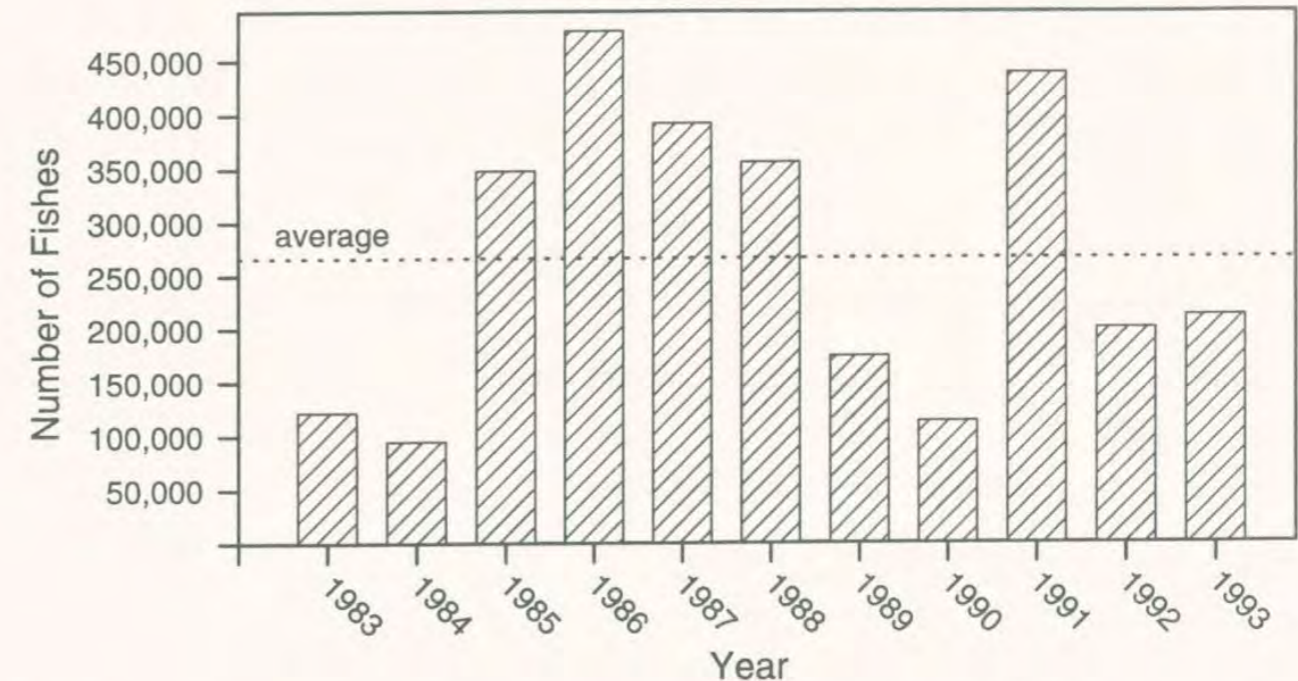


Figure 21. The total recreational landings of spotted seatrout in South Carolina for an 11 year period. The dashed line represents the average annual catch for this time (@268,000 fish). The low catches of 1989 resulted from a reduction in the number of anglers fishing that fall after the passage of hurricane Hugo. More people were driving chain saws and hammers rather than boats. The diminished harvest in 1990 probably resulted from the decline in the fish population caused by the effects of the hurricane (many locations in the state's estuaries had water which contained no oxygen which caused fish kills) as well as the Christmas freeze of 1989 which resulted in the death of spotted seatrout and red drum in the affected areas.

fishing trips, creel clerks measured a proportion of the fishes caught. Using these data, we determined that the sizes of spotted seatrout caught in South Carolina's fishery has remained relatively stable from year to year since the institution of the 12 inch minimum size for this species in 1986.

For example, in 1993, 1203 spotted seatrout were measured by the clerks. They ranged in size from 11 to 24 inches in length (Figure 22). Less than 1% of the fish encountered by the samplers were less than 12 inches long. Spotted seatrout between 13 and 15 inches in length made up about 70% of the total catch. If you convert the lengths of the spotted seatrout in the recreational catch to ages of the fish, almost 75% of the total catch of spotted seatrout in the state is made up of one-year-old fish

(Figure 23).

Many anglers have inquired about the condition of spotted seatrout populations in South Carolina. Of late, a question frequently asked by the hard-nosed anglers (=those that would rather fish than eat) is "Where are the big trout that we used to catch?". Based on my own fishing experience, I would say that a three pound spotted seatrout would be a good fish, and anything over four pounds would be exceptional. An average 3 pound spotted seatrout would be between 20 and 21 inches long and be about 4 years old, whereas a 4 pound fish would be between 23 and 24 inches long and about 6 years old.

In a recent study of the condition of the population of spotted seatrout in South Carolina, scientists

<sup>7</sup> I would like to take this opportunity to present the reader with my laws of fisheries biology; I can not take full credit for all of them, since others have first voiced them. I merely refined them. They are as follows: 1) once you're dead, you're dead; 2) if your parents had no children, you probably won't; 3) fish that are killed when they are young and small probably won't grow up; 4) the survival rate of fish in an ice chest is generally zero.

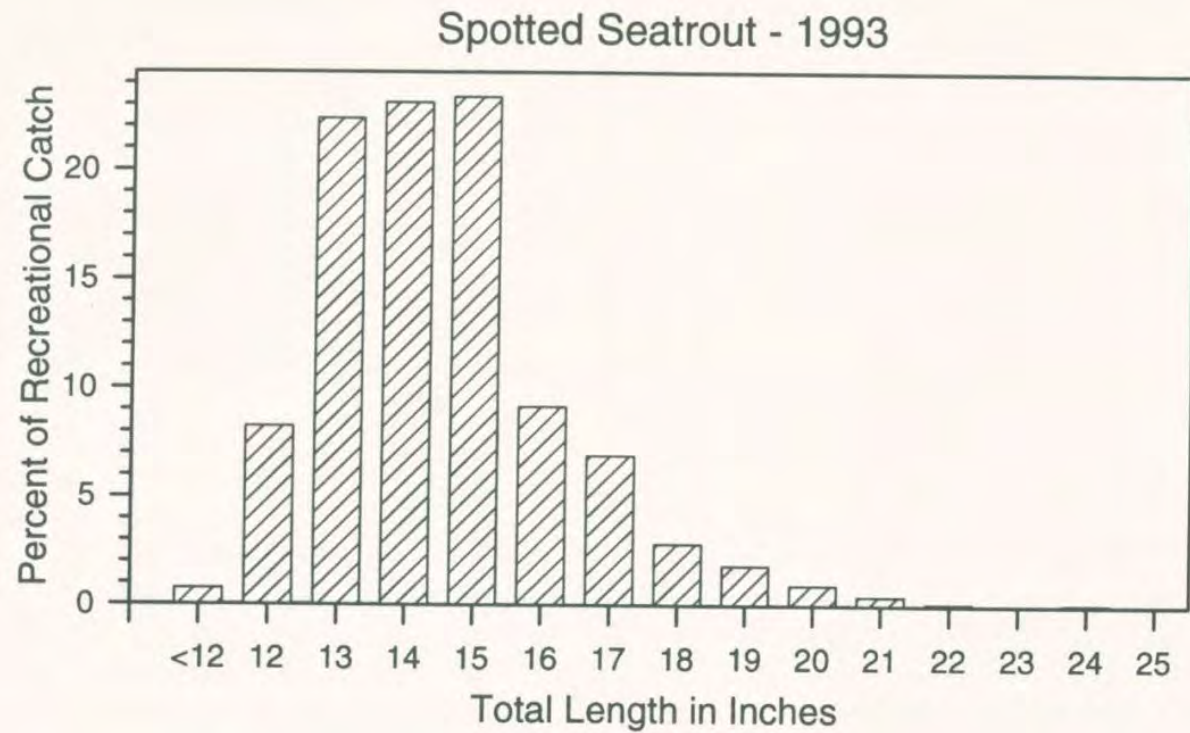


Figure 22. The sizes of the spotted seatrout caught by recreational anglers during 1993. About 30% of the harvest was from trout that were less than 14 inches in length. Only about 13% of the harvest was made up of fishes greater than 16 inches in length.

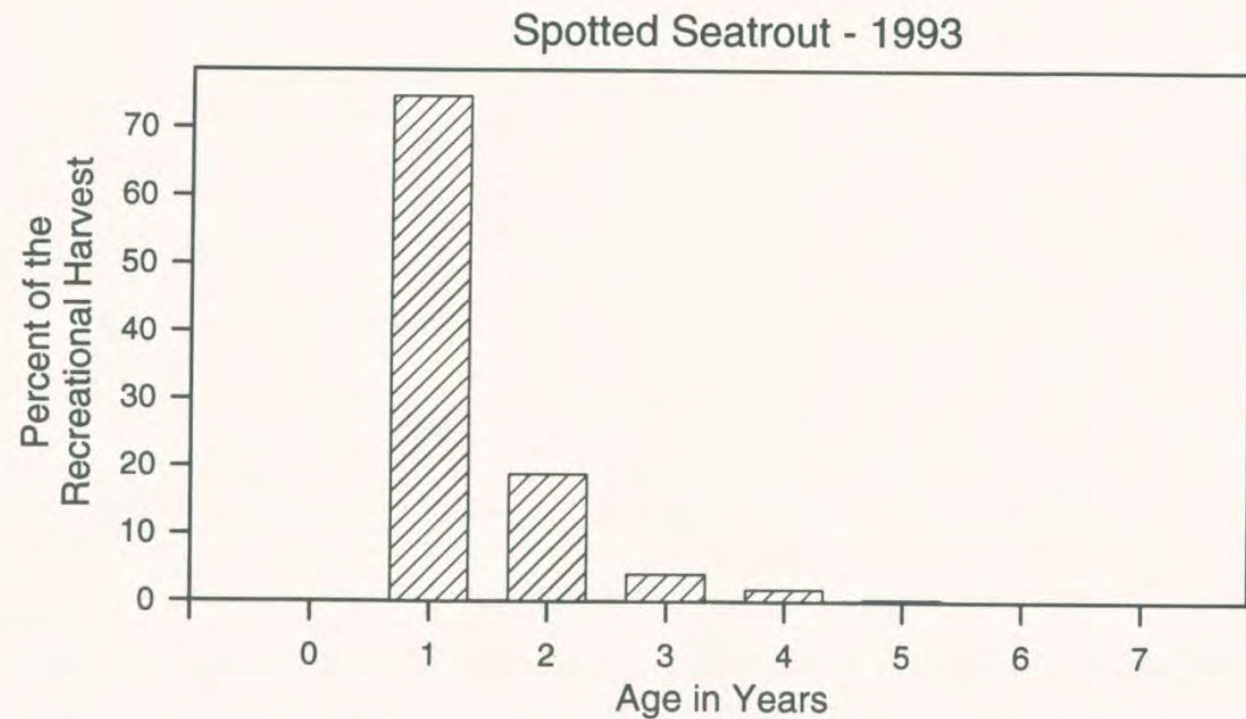


Figure 23. The frequency of ages in the recreational harvest of 1993 shown as a percentage of all fish harvested that year. Over 70% of the catch was made up of one year old fish. Note that fish older than three years were scarce in the recreational creel. In 1993, age 1 fish were born during the 1992 spawning season, and age 5 trout were born in 1988. We would call these age 1 fish members of the 92 yearclass.

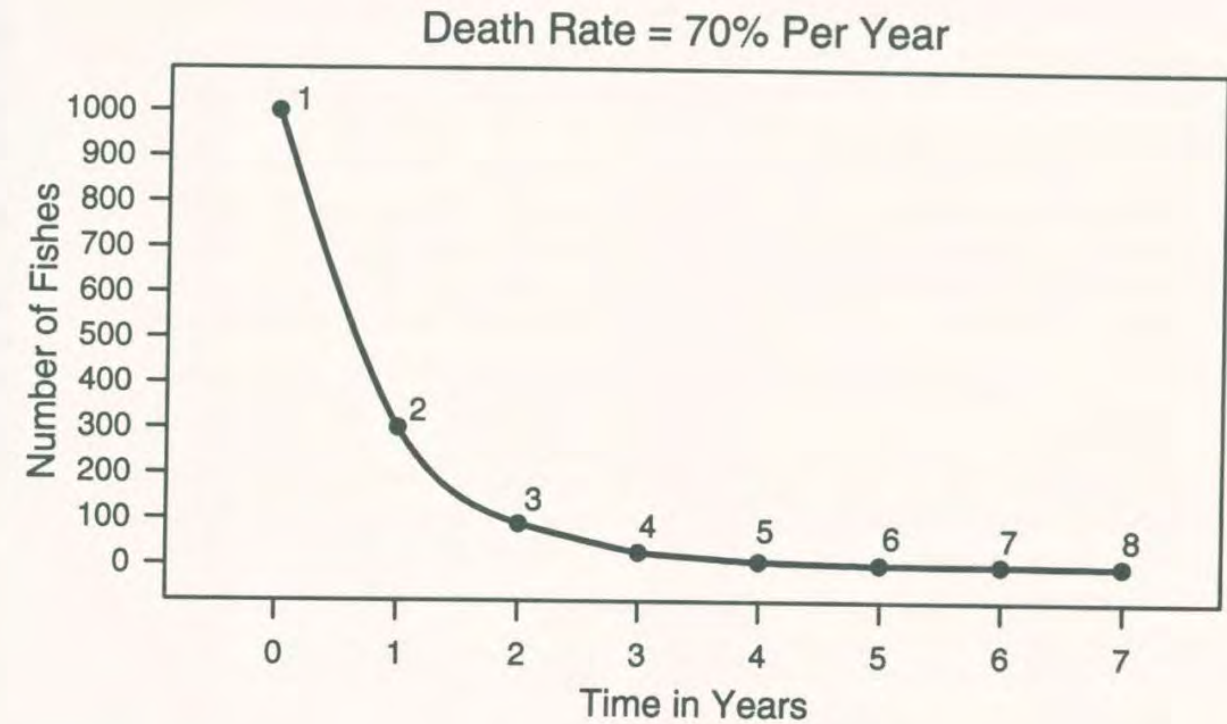


Figure 24. The rate of disappearance of a hypothetical group of 1,000 fish with a death rate of 70% per year (which is approximately our present estimate for the death rate of spotted seatrout in South Carolina). The numbers beside each of the symbols represent the age of the fish. If you start at time 0 with 1,000 age 1 fish that die at a rate of 70% per year, in one year you will have 300 age 2 fish remaining; in two years, you will have 90 age 3 fish, and so forth. Note that at this death rate, few old, large fish remain.

of the Department of Natural Resources have estimated that the annual mortality rate of this species is about 70%. This means that, on average, 70% of the spotted seatrout die each year from fishing and natural causes.

Natural causes including diseases, parasites, predators, environmental factors such as temperature, low levels of dissolved oxygen, etc. account for about 26% to 33% of the annual loss. The remainder, or 37 to 44% of the total mortality, is due to fishing. Figure 24 shows that if you start with 1,000 spotted seatrout and subject them to a death rate of 70% per year, one year later their number will be reduced to 300 individuals, two years = 90 fish, three years = 27 fish, 4 years = 8 fish, 5 years = 2 fish, 6 years = 1 fish, and seven years = 0 fish.

Given the present estimate of the annual death rate of spotted seatrout in our state, of the 1,000 one year old fish, 27 would make it to age 4 and only 1 would make it to age 6. From this you can see that the odds of catching a trophy spotted seatrout given the present harvest rates are slim.

The spotted seatrout resource can be managed in such a way as to increase the probability of catching a trophy fish. The way to do that would be to reduce the death rate of the age 1 trout caused by fishing. If the minimum size was raised from 12 to 14 inches total length, the average one year old fish would be protected for an additional year. As a result, fish under 14 inches would only be subject to natural mortality and the mortality associated with catch and release.

In the recreational harvest, trout less than 14 inches total length presently account for about 30% of the harvest. Previously, we have pointed out that our best estimate of the mortality associated with catch and release of spotted seatrout in the recreational fishery is about 25%, and the highest estimate of the natural mortality rate is about 33% per year.

If we modified the method of fishing, that is, if we implemented a 14 inch minimum size limit, and followed 1,000 spotted seatrout through the fishery, the chances of catching a trophy fish would

increase. If our harvest rate is about 37% per year, i.e., 37% of all spotted seatrout are caught by rod and reel each year, 370 trout less than 14 inches in length at age 1 would be caught and released by recreational anglers. Of these, 278 will probably survive<sup>8</sup> the experience which leaves about 908 individuals from the original 1,000.

If these die at a rate of 33% from natural causes as they pass from age 1 to 2, this will result in about 608 fish making it to age 2. If they were then harvested at the present estimated rate of about 37% per year, and this was coupled with the death rate from natural causes of 33% per year, 182 would reach age 3, 55 to age 4, 16 to age 5, 5 to age 6, and 1 to age 7. This would approximately double the chances of an angler catching a three to four pound fish (Figure 25).

In order to achieve these results, what would we have to give up? On average, thirty percent of the spotted seatrout harvested in South Carolina are fish that are less than 14 inches in length. For example,

since sampling by the creel clerks at boat landings and piers found 31.3% of the spotted seatrout they measured in 1993 were less than 14 inches long, the theoretical harvest (if a 14 minimum legal size was in place) would have been about 137,000 fish.

The weight of a 12 inch fish is not much, about 10 ounces, and after you fillet the fish, and discard the carcass, you will have about 4 to 5 ounces of edible flesh. Even a 14 inch fish that weighs about a pound, will only yield about 6 to 7 ounces of edible flesh.

If a minimum legal size of 14 inches was implemented, what are the gains? First, you would have a better chance at catching a trophy trout because more would reach an older age and larger size. Secondly, although the total number of fish harvested would be less, there is a reasonable probability that the weight landed by recreational anglers would be greater than before the size limit due to the increase in body weight of the individual fish. Third, if the mortality rate on the spotted seatrout population

is reduced, a larger pool of mature adults would be available to enable populations to rebound from the catastrophic events such as severe winter freezes.

For example, if you started with 1,000 fish at age 1, with a 14 inch minimum size limit, 608 fish would make it to age two, whereas only 300 would reach that age with a 12 inch size limit. If you had a severe winter freeze which killed 75% of the spotted seatrout in state waters, you would have more fish that would spawn the following spring and summer with the higher size limit (154) than with the 12 inch limit (75). The more spawners you have, the greater the chance of successful recruitment and the higher the probability of the population recovering from an adverse event.

Because our spotted seatrout are only slightly overharvested at this time, minor adjustments in the size and/or creel limits could easily lead to improvements in an angler's ability to catch good fish. One reason why we fail to see larger trout in our waters is that we harvest them before they have a chance to grow up.

The decision as to whether the State should raise the size limit to 14 inches will mainly depend upon the desires of the angling public. The options are: (1) with a 12 inch size limit, the harvest will be larger but be composed of smaller fish; (2) with a 14 inch size limit, the harvest will be smaller (in numbers of fish landed) but be composed of larger individuals, and the probability of catching a good fish will increase.

In any event, the following items need to be remembered. South Carolina *is the best that is left along the east coast*. Most other coastal areas are heavily developed, and we are blessed with some of the remaining unspoiled areas, i.e., the coast from North Inlet to Capers Island including the North Inlet Estuarine Reserve, the Santee Delta, Cape Romain Wildlife Refuge, Bull and Capers islands, and in the south central coastal area, the ACE Basin. Those estuarine and coastal areas that are contiguous to relatively highly developed areas need to be carefully protected so the quality of their estuarine habitats remains good.

Secondly, as the "Baby Boomer" generation ages and more people retire, many members of this group will seek the pleasures of life in the coastal

counties of our state. All these folks will have time on their hands, and in all probability, many will fish frequently and place added pressure on the resource. The size of the resource will not increase, however. Therefore, each individual's share must decrease if the State's gamefish populations are to remain healthy.

**In essence, we (recreational anglers) are responsible for the condition of this resource. If the condition of South Carolina's population of spotted seatrout deteriorates, we can't blame the commercial fisherman; because the species is a gamefish. Also, we can't blame the shrimp trawlers for catching it during shrimping operations since this species is very rarely caught in their nets. If things get worse, we need only look in the mirror and repeat the words spoken several years ago by Pogo (in the comic strip written by Walt Kelly), "We have met the enemy and he is us."**

<sup>8</sup> This uses our best estimate of the mortality rate from catch and release by recreational fishing gear;  $370 \times 0.25 = \text{number killed by hook and line}$ ; viewing this in a positive light,  $370 \times 0.75 = \text{number of trout that survived their encounter with recreational anglers during the year}$ .

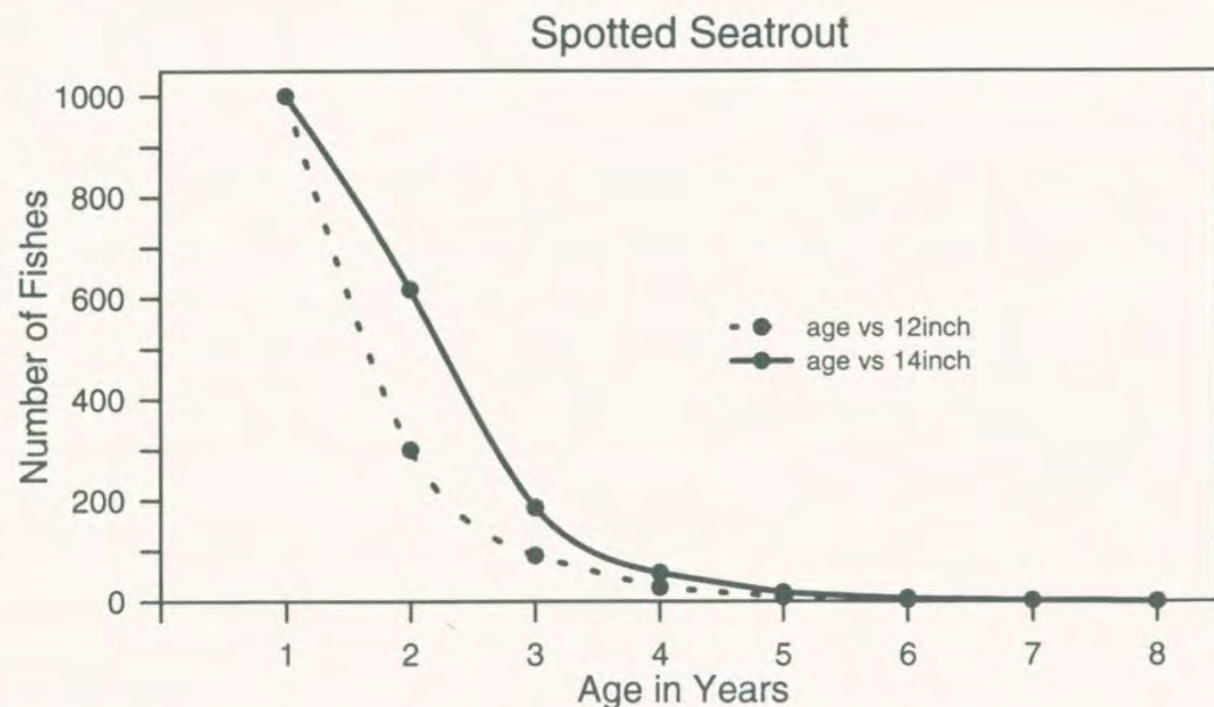


Figure 25. Changes in the survivorship curve which would result from an increase in the minimum size limit from 12 inches in length to 14 inches in length. There would be approximately twice as many fish that made it to age 2, and the odds of catching a trophy fish would be increased.

#### FISHING AT NIGHT by Charlie Wenner

When I first began to fish with some intensity as a teen, I chased striped bass in the waters of Long Island Sound. Since most of my fishing was during the summer months (= the summer doldrums), the best fishing, no the only fishing was at night. You could spend all day on the water and never see the first sign of a striped bass, however, when the sun set, the bass would feed on small fishes such as menhaden in tidal rips.

After a two year stint in the Peace Corps in Ethiopia, Africa and after honoring a request for my services over a two year period as a member of the US Army, I entered graduate school in Virginia. After a few years, I finally bought a four wheel drive vehicle. It was a 1972 Ford Bronco.

I spent more time than should be legal on the beaches of the Outer Banks of North Carolina. Although I fished for about everything from the beach, the real sought after prize was the red drum. On the Banks, I have occasionally witnessed the catch of a trophy-sized animal during the day, however, night time was when the chance of having some real action was (and is) greatest.

When I arrived in South Carolina and began to pursue spotted seatrout and red drum, I was surprised that so few people fished at night. One old timer, Boo Lachicotte, kept after me to try night fishing. He said that even during the hot summer he could catch large fish on artificial baits.

He was not as forthcoming with the locations as he was with the time. If I saw him in the early morning with some



very nice trout in his cooler and asked him where he caught them, he would invariably reply that he caught them at night in Charleston Harbor. Charleston Harbor is a pretty big place, but that was as specific as he would get.

Knowing that I had always done pretty well at night in other places really gave me the desire to give night fishing in the harbor a try.

Our old fishing team that was composed of yours truly and a good friend who has subsequently moved north of our state (not all the way north; just to North Carolina) decided that perhaps we should give this night fishing a try. As anyone who has fished our estuaries knows, tidal stage is an important variable. We had sampled the lower Charleston Harbor with nets during the early spring to obtain some trout for our work, so we weren't completely in the dark (so to speak) in our choice of tides and locations.

During the early trips, we had variable results. The baits of choice were all artificials, mainly broke-back floating Rebels, Bombers, white grubs, red-head Mirrolures, countdown Rapalas and so forth. What trout we caught were nice, generally ranging from 2 to 4 pounds, and frequently we enjoyed casting popping plugs (small Striper Swipers) to bluefish (1 to 3 pounds) in the tidal rips. So it went through late April and early May during our first year.

Our tackle generally consisted of light 6 to 7 foot, one piece rods, with Penn 410 spinning reels filled with 6 or 8 pound test. A ten foot long piece of 20 pound monofilament was tied to the bitter end of the lighter line to act as a shock leader. The plugs were secured to this with any one of a variety of loop knots that allowed the lure to have much more action than it would have had when fastened with a swivel.

Anyone who has been inside a tackle store knows that the owners do not give away broke-back Rebels because you smile nicely. They generally cost from \$3.50 to \$5.25 each depending on size and place of purchase. It is also a well known fact, that if having one of every type of plug is good, owning two of each of them is better, and having a whole box full of them is best. I don't think I ever owned just one of a lure.

When the days started to get real warm in late May and June, we still continued to go and have some success. The night air was cool and pleasant and it was just wonderful to be on the water with not another soul in sight. Night fishing was created by God on the same day He made country ham biscuits.

Fishing at night, especially when you have had less than a full complement of sleep, leads one to enter into a kind of mindless, Zombie-like state after a few hours when the action is slow. I call that my 'flat-line' period. One night I entered that zone and was soundly shaken from it by what I consider to be one of the real bad guys in the bay.

After casting a broke-back Rebel up and across a tidal rip, I brought it back slowly. The rip provided most of the action to the plug, and the tight line merely guided its trip through the water. All of a sudden, the quiet of the night was shattered. There was a tremendous swirl in the rip, my rod tip bowed and line screamed off the reel. The line went slack. The plug was gone and the line was frayed from the oyster shells.

"What the hell was that?" exclaimed my partner. "I have no earthly idea," I replied. The only problem with night fishing is that everything is a little more difficult to do because you can't see, and if you're like me and have those cross hairs in your glasses (bifocals), knot tying is a challenge during the day and a feat at night. It took me longer than I wanted to attach a new shock leader, tie on a new plug, and make sure everything was in order. My slowness in getting things back together was not only caused by the darkness but also from the trembling of my hands. Strikes from fish (especially when unexpected) cause my hands and sometimes my knees to shake. The intensity of the uncontrolled movement is related to whether or not the event was expected or not. I generally shake more when the strike was completely unexpected, i.e., my brain activity waves were flat.

Finally, I flipped a brand new Rebel into the rip. Nothing. Once again, I slipped back into the rhythm of cast-reel, cast-reel and my brain re-entered the twilight zone. It happened again. Splash, line tears off the reel, line goes slack. I lost a total of five broke-back Rebels that night and my partner went through two Rebels, a bomber, and a Bagley's silver finger mullet. My line was in shambles as was his.

After four of these encounters, we finally figured out that we were dealing with jack crevalles. These fish were about as long as your leg, and there was no way on God's blue ocean that we were going to stop them in a four knot rip with a spool of six pound test line. One should not go bear hunting with a twenty-two. (A friend put it to me another way - with the tackle we were using you had as much of a chance to stop the run of a good-sized jack in the rip as using the line tied around his bumper to stop his pickup truck as it sped away.)

Encountering jacks at night is an irregular event. Generally if you bring some stouter tackle with you so that you may have a chance of catching one, they do not show up. Also, they prefer the most expensive plugs fished on the lightest line. You can throw grubs at them with twenty pound test, and they'll simply ignore them. However, if you switch to lighter tackle and tie on a five or six dollar plug, they'll hit it in an instant. When they do, it has been my experience that the probability of landing the fish is next to nothing.

Is the hassle of night fishing worth it? I say heck yes. Give it a try during the late spring or summer. The best locations are around the lower parts of estuaries near the inlets, for example between the bridges and the ocean in Charleston Harbor. I prefer ebb tide, but I have heard of other having success during flood tide. Pick an area that has a good tidal rip, and give it a shot. Even if you fail to find the fish, you will find the time to be peaceful and beautiful.

## FISHING FOR TROUT

by John Archambault

I want to begin this section on sport fishing for *Cynoscion nebulosus* with a disclaimer. I am not a spotted seatrout fishing expert, but since my first trips to the pond for bluegills and bullhead more than twenty five years ago, fishing has been my driving passion. In 1987, my then wife-to-be, Mary, and I moved to Charleston upon my securing a job with the Wildlife and Marine Resources Department. Since that time I have pursued "trout" on a regular basis with live bait, lures, and in the last few years, flies.

In 1990, I began sampling South Carolina's estuaries conducting research on spotted seatrout while working with Charlie Wenner and the Inshore Sportfish Research Section. Through work and fishing, I've been lucky enough to spend thousands of hours on the water and have seen countless trout (a few of which I actually caught on my own). Also, in my capacity as the manager of the tagged-fish data and reward system (for those fish caught and tagged by our section), I have talked with many other fishermen over the last few years. Some of them have been generous enough to share bits of their wisdom and experience. I hope then, that I am qualified to offer advice to help beginning anglers get started in trout fishing.

Veteran anglers may find some of the following information to be old hat. Because there is seldom only one right way to do things, some readers may even disagree with my advice. I'll do my best to cover the basics of the sport as I see them, and who knows, maybe I'll reveal a new approach or tactic that could help even the experts.

The first half of this guidebook was devoted to the life history of spotted seatrout. Successful fishermen form a plan on where, when, and how they will fish before they set out. They choose what they hope will be the best location to find trout (considering the season, tide and time) and then fish with a bait or lure that they hope will draw strikes. They may not realize it, but these fishermen base their decisions on knowledge of the spotted seatrout's natural history.

The where, when, and how's of fishing are dif-

ficult to separate, as they are highly interdependent, but I will attempt to cover them in order.

## WHERE

When it comes time to decide where to fish, we are usually looking for our quarry's feeding habitat. Feeding habitats are places that concentrate an animal's food, or places that provide a predator with an advantage over its prey. Generally speaking, prey become concentrated in any particular area because they are in search of their own food, attempting to avoid predators, or blocked by some barrier while traveling. Predators are provided with an advantage over their prey by conditions which disorient or disable their prey more than themselves, or by natural ambush points where they can lie in wait.

What constitutes spotted seatrout feeding habitat, and why? Many species of crustaceans and small fishes collect in or around oyster bars or in flooded marsh to feed and to avoid their predators. Spotted seatrout will often search the edges of such areas in search of these baits. Points of land and creek mouths form both barriers to traveling bait and ambush points for the trout.

Creek mouths form natural funnels for animals moving in and out of the creek with the tides. All baitfish or crustaceans moving along a bank must pass by points and creek mouths. As they pass these obstructions they tend to become concentrated as their travel is temporarily impeded. Also, points and creek mouths tend to form tidal current rips, as do drop offs. Strong currents disorient and overpower large predators less than they do smaller prey species, thus they give seatrout an advantage.

Apparently, then, when in search of feeding seatrout, we should seek oysters, marsh, points, creeks, drop-offs, or rip currents. Because these features make up most of the South Carolina coast, we need to narrow our search. To do so, look for the most prominent of these features and for combinations of them. Figure 26 depicts some hypothetical examples of good spotted seatrout fishing locations and the way the desired features might be arranged.

A large high-relief (tall) oyster bar provides better fishing than does an even distribution of oysters

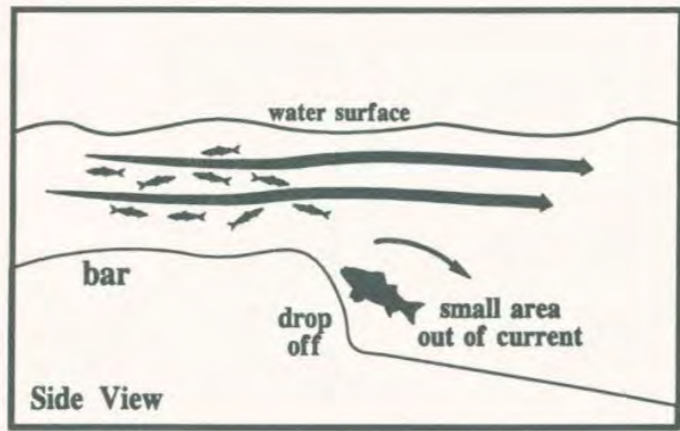
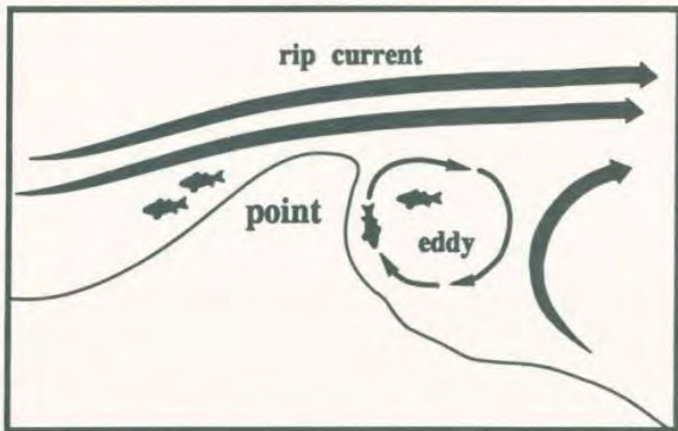
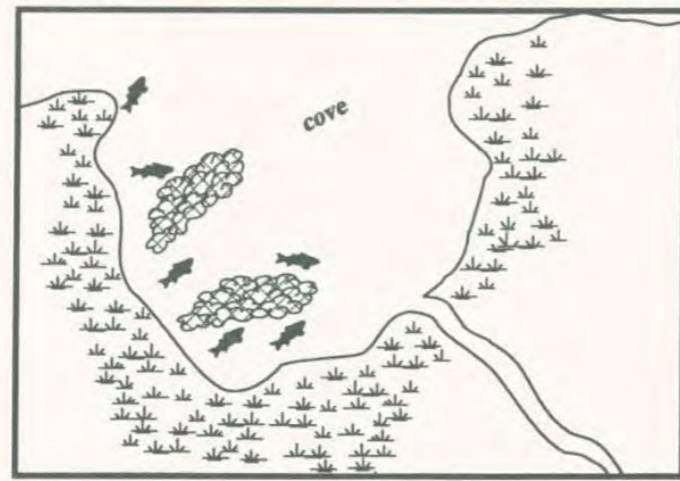
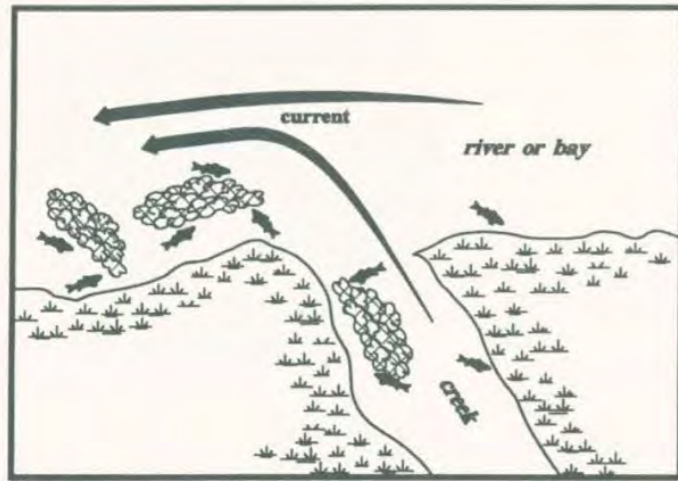


Figure 26. Some typical trout fishing locations.

along a bank. A creek mouth, point, or sheltered marsh cove with a large oyster bar (or several bars) will be better than one without bars. A marsh edge in a cove or bend, sheltered from heavy current or wind, and adjacent to fairly shallow water will hold the most bait, and thus trout. (In this case the bait are congregated partly in refuge from current and wind.) Marsh edges within or just outside of large creek mouths tend to be good fishing spots. The mouth of the largest creek in an area or the point which extends farthest into a river or bay will often be the best fishing spot.

Islands in large rivers, bays, or harbors often contain several of our desired features and thus provide multiple good fishing locations. The ends of the islands that point into current (either upstream or down) can form some of the best current rips. Points and drop-offs oriented across the flow of current create strong rips and, at the same time, eddies

where the trout can wait for their prey. One side of an island will provide better fishing than the other, often the more sheltered side is better.

Once you know the features to look for, you can begin to locate good spotted seatrout fishing spots from a navigational chart. Within the area that you plan to fish, pick out creek mouths, points, or what appear to be shallow grassy edges or oyster bars (grass is not marked on charts, but oysters sometimes are).

The next step is to get out on the water and take a good look at each potential spot at different tide stages. Look for oyster bars at low tide when they'll be exposed. As the tide ebbs and floods, you will be able to see how the water flows around structures and can locate rip currents and eddies. Remember, though, that currents differ from one day to the next.<sup>9</sup> Also, wind speed and direction will affect tidal amplitude and can also change the position of

rip currents. Finally, the only way to be sure if an area holds trout is to try fishing at each potential location several times.

## WHEN

"When?" to fish for spotted seatrout is a three part question: season, time of day, and tide stage all affect trout activity. While spotted seatrout can be caught at all times of the year, any time of day, and at all tide stages, not all combinations of the three will produce good fishing.

Location and tide stage are often closely linked. Fishing in almost all locations is better when tidal current is flowing than it is when the current is slack. Changing water levels cause prey to move, and produce strong currents in certain sites. Some deep locations can only be fished around slack tide, though, because in a strong current it is difficult to get a bait or lure down to the depths where the fish are located.

The grassy edges and coves are generally high tide spots, since at that time they will be flooded and the bait fishes and shrimp will be hiding and feeding in the grass.<sup>10</sup> Creek mouths often provide more action on a dropping tide as bait moves or is flushed out of the creek. Many points and drop-offs form a stronger rip current and hold more fish on an ebb (dropping) tide, but some may be best during a flood (rising) tide. In the end, trial and error is really the only way to find the best tidal stage at which to fish any given location.

Two important facets of timing remain to be considered: time of the year and time of day. For the purposes of discussion, let's divide the year into seasons as follows: Winter = January, February; Spring = March, April; Early summer = May, June; Late summer = July, August, September; Fall = October, November, December. These are not the standard calendar seasons, but functionally, for

seatrout fishermen in South Carolina, they may be more appropriate.

During the winter, the trout are cold and often sluggish. Their behavior is controlled by the low temperatures. Since fish are cold blooded, they regulate their body temperature by seeking areas with the most comfortable temperatures. During winter the shallow to medium depth (two to six feet deep) sheltered flats with grassy edges and somewhat isolated deep holes are the most productive trout fishing locations, especially if the two habitats are close together. (Large areas of deep water will not be as productive as a deep hole surrounded by shallower water, such as occurs in many creek mouths or bends.) This results partially from the fact that shallow water warms or cools more quickly than deep water does.

When relatively warm days occur during late fall through early spring, trout will congregate on the warmer flats to feed. Conversely, cold snaps will drive the trout off of these flats and into nearby holes. Traditionally, winter trout fishing is good in the upper reaches of tidal rivers, but good numbers and large trout can also be taken just inside the estuary, close to the ocean.

During spring and summer the trout's primary concern shifts from warmth to reproduction. With warming temperatures the trout begin to rebuild the energy reserves depleted by the rigors of winter. They then spawn from May through August or September. Therefore, during spring they move down river and congregate in the vicinity of their favorite spawning sites: deep water with structure that is exposed to strong currents (bridges, large piers, points, and inlet holes).

I suspect that many summertime trout (especially the largest ones) spend their days in deep water, hiding from heat and bright sunlight. We have data, from our research with the hydrophones, which suggests that spotted seatrout spawn from

<sup>9</sup> Spring tides, which occur on the new and full moons, produce higher high and lower low tides, and thus stronger currents than the average tide. The weakest currents and smallest tides, called neap tides, occur during the first and third quarters of the lunar cycle, at the half moon.

<sup>10</sup> While spotted sea trout will occasionally move into very shallow water to feed, I recommend looking for them in depths of at least two and a half to three feet.

dusk until near midnight. We theorize that the spawners then move to shallower water to feed most heavily from midnight to just after dawn. If our theory is correct, it suggests two strategies for attempting to catch these large trout: fish for them in the deep water close to spawning sites during the day, or in nearby shallower "feeding habitats" from dusk to dawn.

While nighttime fishing is not for everyone, it offers several benefits. In contrast to hot muggy days, summer nights tend to be pleasantly cool. Even the best and most popular fishing spots are deserted at three o'clock in the morning. I'm not an early riser by choice, but getting up at midnight doesn't really count as early. Anyway, hooking up with a three or four pound trout is all I need to stay awake.

Fishing at night offers unique rewards, but also requires extra caution. Reduce boat speeds and don't go anywhere that you haven't scouted during daylight to learn of potential hazards. Also, remember that depth perception is short-circuited in low light. Even though it appears that a bank or marker is still a long way off, be careful: it might be a lot closer than you think.

One last point: while fishing, use lights as little as possible and keep them pointed away from the water. Not only will lights spook the fish, but they will also ruin your night vision. The exception to this rule is that some people set up a light and leave it on constantly, or fish near a lit pier or bridge. A steady, uninterrupted light may actually attract bait and thus trout. Again, take care not to move the light or cast shadows on the water.

If you don't care to venture out in the dark, or even if you do, then concentrate your efforts around dawn and dusk. The changing light levels early and late in the day often trigger a feeding spree.

Trout spend the fall utilizing abundant forage before the hard, cold months ahead when prey will be much less plentiful. The fall provides some of the best fishing of the year because spotted seatrout and other gamefish feed heartily without concern for time of day. Cooling temperatures seem to invigorate the trout and inspire feeding binges. Shrimp are large and abundant. Small mullet and other baitfish seem to fill the shallow coves and marsh creeks.

All of the previously mentioned fishing spots will hold trout in the fall. Many of the forage species migrate offshore or southward for the winter, and the trout stake out natural ambush points along the route, such as creek mouths and points.

Water clarity, which varies over time and location, can have a profound effect on fishing success. In general, trout fishing tends to be more productive when the water is clear. The angler faced with dirty murky water can wait a few days for it to clear or move to another area. If this is not possible, then the use of brightly colored lures or live bait will partially overcome the handicap.

Poor clarity is often the result of moving water stirring up bottom sediments. The extra-strong currents that occur during spring tides tend to muddy many shallow mud-bottomed parts of an estuary with the exception that water ebbing from some rivers and most creeks will tend to be clearer.

Because high winds also produce murky water in shallow areas along exposed banks, you should look for clearer water near shorelines that are protected from the wind. Extended periods of strong wind may muddy a whole system, though. A change in water color, resulting from increased river discharge following heavy rains, does not seem to spoil trout fishing as much as poor clarity does.

## HOW

The most effective method of fishing any location will depend on the answers to three questions: how big is the fishing spot? how deep is the water? and how fast is the current?

If the feature that you want to fish is fairly broad, such as a whole grassy cove or a long bank with oyster bars, then it calls for a fishing technique that covers a lot of water. You might try trolling up and down the bank at different depths and distances from the bank: search for the right combination until you catch fish. Searching a large area with live bait might be difficult, since natural baits tend to be moved slowly or not at all. Some anglers do troll with minnows, though. The bait is hooked through the lips on either a lead-headed jig hook or a plain hook with some weight (split shot or egg sinker) on the line a foot or so above the bait.

When the wind and current allow a convenient parallel drift (or if you have an electric trolling motor), you could move slowly along and cast toward the shore with artificial lures: a grub jig, floating/diving swimming plug, mirrolure, or flies might all be good options. If a concentration of fish is found, then it might be more productive to anchor. Sometimes, though, the fish will be scattered throughout the area.

If the spot fished is smaller, such as a creek mouth, point, or large oyster bar, then your options change. Anchor the boat and cast artificial lures or fish with live bait to cover the area more thoroughly. Often, a good way to search such an area is to use live bait with a float rig and allow it to drift around the structure. If the water is deep, then use deep diving lures, lead headed jigs, or bait fished on or near the bottom.

Strong currents will require adjustments to your fishing tactics. Heavy current will sweep bait or lures along. Often this will require casting well upstream of your target allowing the current to carry the bait or lure to its mark. Fishing float rigs in swift current is impractical. Almost as soon as a cast is made, the bait is swept past the desired location and must be retrieved. Also, it's troublesome to fish bait on the bottom. If it is cast across the current, water will drag the bait along the bottom and tangle it on any snag in the area.

Live baits can be very effective in strong currents. Often, though, you'll have to cast nearly straight downstream, so position your boat directly up-current of the target area. Also, look for eddies in the current where the flow will be lighter and will allow the bait to linger longer. The more time the bait spends in the desired location, the greater chance a fish has to find it and the higher the probability of a strike.

A few of my favorite seatrout spots might provide good illustrations of typical South Carolina estuarine habitats that hold spotted seatrout, and of possible tactics for fishing them. Lets begin with the mouth of a creek that empties into a larger river. An oyster bar has grown along one corner of the creek

mouth. I've caught the most fish here anchoring the boat near the mouth and fishing with live bait on a float rig. The bait is cast near the bank and allowed to drift along the oysters. Usually, the very corner of the creek mouth is the best spot, but it pays to check along the entire oyster bar and both sides of the creek mouth. If I find that most strikes come at a particular location on the bank, then I will concentrate my casts there.

The second location is a large oyster bar near a point extending into a bay. I've fished this spot in many ways, but most of my time there has been spent casting plugs (a type of artificial lure). When the tide is high, floating-diving plugs can be cast right over the top of the bar. At lower tide levels, I cast them around the edges or off of the tip of the bar. Many floater/divers stay shallow enough that they don't snag in the shells.<sup>11</sup>

At times I also fish around the bar with live bait, either over the shell using a float, or on the bottom around the edges where snags are less likely. In such a situation it pays to know the habits of the different live baits. Finger mullet and menhaden will usually stay near the surface, even without a float. Shrimp and mummichogs will go to the bottom. A gentle current (an eddy of the current flowing by the nearby point) usually sweeps across or along the bar. Float rigs, free swimming baits, or flies can be allowed to swing or drift in the flow.

Two of my other hot spots rely on strong currents to bring in the trout. One is at the point of an island where the ebbing tide forms a large eddy. The current flows quickly on either side of the island, but right on the point is an area of slower, swirling current. I generally anchor the boat in the slower current and cast lures to the point of the island and also let them swing in the faster current on the edges. I've also had good luck there while fishing with live finger mullet or menhaden. Live baits are cast either into the eddy on the point or to the edge of the faster current. I've yet to fish this area with flies, but I bet it will be perfect for swinging and drifting flies in the rips and eddies.

The last of the trout fishing spots that I want to

<sup>11</sup> If a floating lure does become snagged, it can often be freed by letting the line loose and jiggling it. Hopefully the lure will come free and float clear of the snag. Sinking lures are more difficult to dislodge.

describe is also on the point of an island. In this case the tidal current flows very quickly across a shallow bar of dead oyster shells. At the end of the shell bar the bottom drops by only about one to two feet. It's a small dropoff, but it's enough to create a small area out of the current. This is a tricky area to fish, but it is worth the effort.

The area produces the most fish at night, when trout are more aggressive and move into shallower water to feed. The boat has to be anchored in the swift current on top of the bar. Trout can be caught anywhere in the rip, but the "magic" spot is the lip of that small drop-off. The fast current sweeps over the drop-off and creates a small area of slack water just against the lip. The trout sit in the slack water and wait for food to be swept along over their head. Lures can be cast to sweep over the drop-off, or live baitfishes, weighted with a split shot or two, can be cast just over the edge of the drop.

This rip is also popular with bluefish. If you enjoy catching bluefish, then you'll have a great time when a school moves into the area. If you would prefer to catch trout, your only hope is to get your lure or bait down to the bottom, below the blues, before they see it. That can be difficult, but if you move it very little and use a little extra weight, it can be done. Sometimes, trout feed below or downstream of blues, taking advantage of the bluefish's sloppy feeding habits and feasting on their scraps. I've often found cleanly cut halves of menhaden in trout stomachs. Trout have sharp teeth, but they are made for grabbing, not slicing, so these fish must have eaten scraps left by other predators.

## TACKLE

The outfit used to fish for spotted seatrout can be as basic as a cane pole or as fancy as today's state-of-the-art graphite rods and sophisticated reels. Most trout fishermen use spinning rods and reels, but spin casting, and bait casting tackle also catch their share of trout. The type of equipment used is up to the personal taste and talents of the fisherman.

Care and regular maintenance will keep your tackle operating smoothly and reliably for years. After each fishing trip, your tackle should be thoroughly washed with fresh water. Most high-quality

modern rods and reels are made of rust resistant materials, but salt and grime will collect and gum things up, even if rust doesn't. Salt and sand can accumulate in crevices or combine with your reel's grease and cause it to clump.

Along with regular rinsing, reels should receive a drop or two of oil at the contact points between moving parts (lubrication points are listed in reel's owners manuals) every month or two. Also, once every year or two it may be necessary to take a reel apart and remove the old grease and replace it with a fresh thin coat of an approved reel grease. (Oil and grease offered by tackle manufacturers for use with their products can be bought from sporting goods stores.) If you wish, fishing tackle shops that perform repairs can do the thorough cleaning and overhaul for you.

## Line

Monofilament line of 6 to 12 pound test is recommended when fishing for trout. The lighter line casts more easily and is usually strong enough to bring in the fish. Heavier line can prevent frequent cut-offs around oysters and other obstructions.

Reels should be kept filled with fresh line of good quality. You don't need to buy the most expensive line around, but opting for discount brands may be a poor bargain in the long run. Inexpensive lines tend to be stiffer and cast poorly (especially in cold weather), compared to higher quality, more expensive lines. In addition, cheap lines tend to weaken more quickly with age.

Check the spool of line occasionally for nicks and abrasion, which can be detected through a rough or fuzzy feel to the line. Nicked or worn line is greatly weakened and is almost certain to break under strain (like when you are fighting the biggest fish of the year, or when you are trying to un snag your favorite \$5.00 lure). Sometimes a spool of line is OK for months, but one day of fishing under tough conditions (lots of big fish, lots of snags, etc.) can wear it out. Also, check the last five or six feet of line frequently while fishing. If it has been nicked by oysters or fish, then cut off the affected portion and retie your rig.

Even if it looks and feels smooth, old line is weaker than new, and is likely to break at stress

points, like knots. What's old? As a rule, plan to replace the line on your reels at least once per year. I replace the line on my favorite rod and reel three to five times per year. Fill the reel's spool to within about one eighth of an inch from the lip: too little line won't cast well, too much line will spill off of the spool causing tangles. Time spent fishing is supposed to be relaxing and pleasurable. Losing fish and rigs because of bad line or weak, faulty knots is frustrating and avoidable.

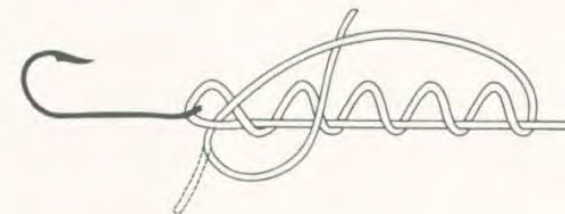
## Knots

All anglers should take the time to learn a few basic fishing knots (Figure 27). It will pay off in the long run. The improved clinch and palomar knots are very strong and fairly easy to tie. They are good choices any time the line is tied to a swivel or hook.

### Improved Clinch Knot



- A. Take the end of the line and push it through the hook eye. Wrap the line end five times around the standing part of the line, and push the line back through the loop formed near the hook eye.



- B. Pull the line end through the loop in front of the hook eye, then push the end through the large loop as shown.



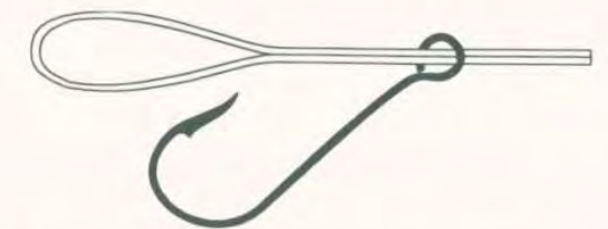
- C. Moisten the knot with saliva, then pull tight. When tying with monofilament heavier than 30 pound test, use a standard clinch knot (B. dashed line): without the last pass back through the large loop.

These knots create a "tight" (rigid) connection. Such a rigid connection is best when attaching a hook for fishing with bait.

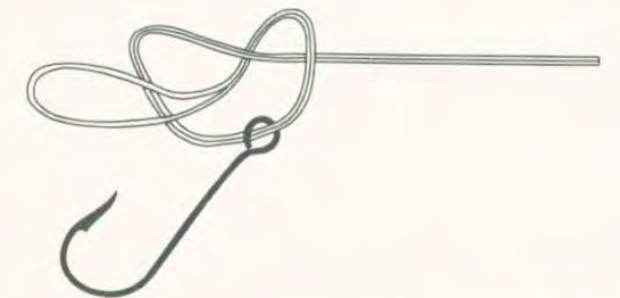
Loop knots are preferred when attaching artificial lures to the end of a leader or line. The loop allows the lure to move more freely and thereby produces a better swimming action. The surgeon's knot can be used to produce a loop, as can the uni-knot system or a nonslip mono loop.

The blood knot and the surgeon's knot should be used to join two lengths of line, such as when adding a leader. Even when using these knots, joining lines of greatly different diameters is not recommended (the lighter line will break easily at the knot). As a guide, I recommend joining a maximum differential of 6 to 15, 8 to 20, or 10 to 30 pound test.

### Palomar Knot

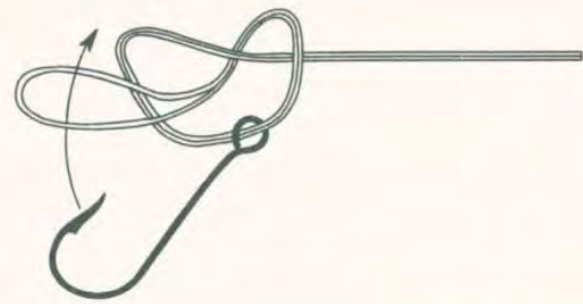


- A. Double the end of the line and pass the loop through the hook eye.



- B. Double the loop back, then make an overhand knot around the standing line, leaving a loop large enough for the hook (or lure) to pass back through.

Palomar knot continued on page 34.

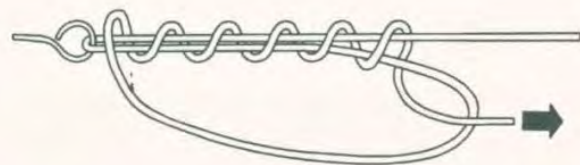


C. Put the entire hook (lure) through the loop, as illustrated.



D. Pulling on the standing line will draw the knot tight. Trim it, and the knot will be compact and effective.

### Uni-Knot System



A. Make six turns with tag end around the double line and through the circle. Hold double line at point where it passes through eye and pull tag end to snug up turns.



B. Now pull standing line to slide knot up against eye.



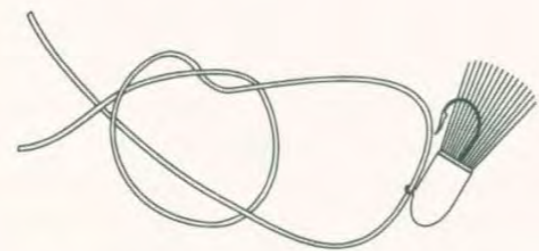
C. Continue pulling until knot is tight. Trim tag end flush with closest coil of knot. Uni-knot will not slip.

### Uni-Knot Loop Connection

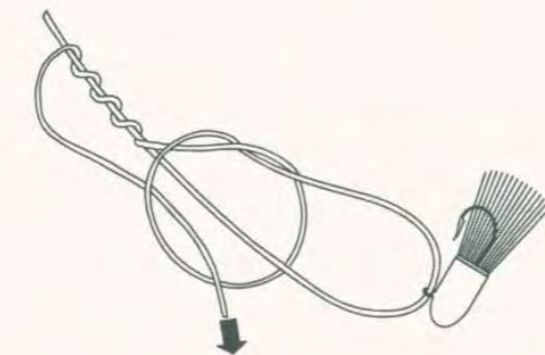


Tie uni-knot to point where turns are snugged up around standing line. Slide knot toward eye until loop size desired is reached. Pull tag end with pliers to maximum tightness. This gives lure a natural free movement in water. When fish is hooked, knot will slide tight against eye.

### Non-Slip Mono Loop



A. Start by tying an overhand knot in the leader, leaving a tag end of at least six inches. Slip the tag end through the hook eye or towing eye and then back through the loop of the overhand knot. Make sure the tag end is passed back through the overhand knot the same way it came out. Pull carefully on the standing part of the line while holding the tag end. This will partially reduce the size of the overhand knot. Then, pull slowly on the tag end, sliding the overhand knot toward the lure eye. This procedure lets you adjust the size of the loop. Now wrap the tag end four turns around the standing part.



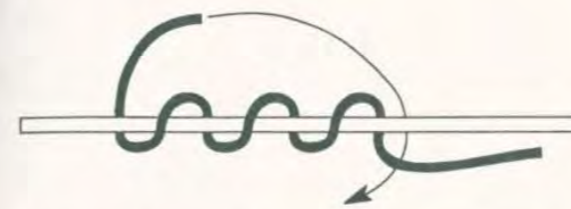
B. Insert the tag end back in the loop of the overhand knot, being careful that it re-enters from the same side it came out. Hold the loop of the overhand knot where you want the finished loop to form and pull on the standing line until the overhand knot tightens. Moisten the knot and begin to pull the tag end. Just before the wraps are completely tight, hold the standing part in one hand and the lure or hook in the other and pull your hands apart until the knot tightens completely. Trim tag end.

### Surgeon's Knot



A. Form a double overhand knot with the long end of the shock leader and the short tag end of the line. Draw very tight. The surgeon's knot is not as strong as the blood knot.

### Blood Knot



A. Cross two sections of monofilament and wrap one section three or four times around the other. Now place the wrapped end through the loop formed by the two mono sections.



B. Turn the other line around the standing part of the first line three or four times, and put its free end through the loop from the opposite side.



C. At this stage the turns should look this way. Now slowly pull on both ends of the line.



D. With its ends trimmed closely, the finished knot looks like this.

### Rigs

Rigs for fishing natural or artificial baits should be kept as simple as possible. Lures are merely tied to the fishing line or to the end of a leader. The simplest bait rig of all is just a hook tied to the end of the line.

<sup>4</sup> Using a swivel can help to prevent fishing line from becoming twisted. If eliminating twist is critical, use a ball bearing swivel. They are more expensive than standard barrel swivels, but they do a much, much better job of combatting twist.

<sup>5</sup> Since swivels can't be reeled through the guides on a light fishing rod, a long leader would be left hanging from the rod tip during casting making casting awkward. Eliminating the swivel by tying the leader directly to the line allows reeling part of the leader through the rod guides.

Trout are often found near oyster bars and other obstructions that can cut fishing line, so it's often wise to use a leader. A leader is a length of heavier monofilament or wire attached at the end of the fishing line, just before the terminal tackle (hook or lure) (Figure 27). When fishing for spotted seatrout with 6 to 12 pound fishing line, a leader of 15 to 30 pound test monofilament is usually adequate. Leaders can be made up before hand by attaching a hook and swivel to opposite ends of the chosen length of monofilament or wire. The swivel is then tied to the line when a leader is needed.<sup>4</sup> Alternatively, heavier monofilament can be tied directly to the line coming from the reel, which allows the angler to make his leader as long as desired.<sup>5</sup>

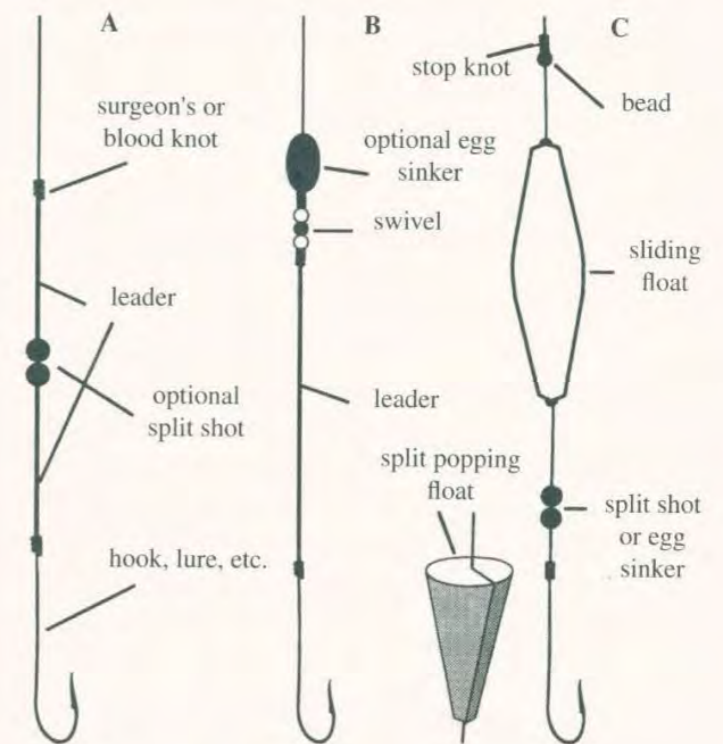


Figure 27. Rigs: A) leader tied directly to the line (using a blood knot or surgeon's knot, split shot are optional), B) leader attached via a swivel (egg sinker is optional; if desired, thread line through sinker before tying on swivel), C) float rig with split popping float or with sliding float.

The choice of leader length and material involves a trade off. Longer leaders or ones made from heavier material provide more protection but also may scare off some fish. The angler has to balance these two factors. Wire leaders provide the ultimate protection, making them the standard choice when pursuing sharp-toothed fishes such as spanish mackerel or bluefish. Wire, however, will almost always reduce the number of bites that you receive. I usually fish with four feet or more of 30 lb. test monofilament leader. While oysters can (and do) cut 30 lb. mono, it prevents most cuts and the extra length of this leader provides good protection and does not seem to deter trout from striking my lures and baits.

For natural baits, popular hook styles are claw (or beaked) and O'Shaughnessy hooks. Hook sizes for trout can vary from less than 2 to 2/0 or larger, depending on the size of the bait used. Choose a large enough hook so that it does not get lost in the bait, but not so large that it kills the bait or adversely affects its movement.

Bronzed steel hooks are my first choice when fishing with bait. Yes, bronzed hooks will rust, but they cost pennies apiece. When one becomes rusty just throw it away and replace it with a new one. If you're like me, you'll lose most hooks before they have a chance to rust anyway. Because stainless steel hooks don't rust, if you lose one in a trout it will remain with the fish indefinitely.

Sometimes it's necessary to add weight to the line in order to get the bait to the depth where the trout are biting. Generally, 1/8 to 1/4 ounce of added weight is adequate to bring most baits to the bottom. However, strongly swimming baits or deep or moving water will require more weight. Split shot are good choices to add a little weight, since they are very simple and easy to use.

If you want to be certain that the bait stays in one place, an egg sinker might be a better choice. Egg sinkers are used with what is known as a fish finder rig: the running line (the line that extends back to the reel) is passed through the hole in the egg sinker and then tied to the swivel which is attached, in turn, to the leader. The further the weight is placed from the hook, the more freedom of movement the bait will have. Place the weight six to

twenty-four inches above the hook.

Various floats are available to suspend a bait above the bottom. Split popping floats are popular. The line passes through the middle of the float and a stick or peg is slid through to hold it in place by friction. The split allows the float to be placed on the line without having to cut off the hook and pass the line through from end to end.

A model of float is available that slides down the line to your hook for casting, but in the water slides back up until it rests against a stop knot tied onto the line. (The knot is made from cotton line or a piece of rubber band. This type float usually comes with a couple of pre-tied cotton knots.) Often, when fishing with a float, a split shot or small slip sinker is placed a few inches above the bait to keep it at the desired depth.

With any bait rig, I follow the rule that "less is more." I recommend using the least amount of weight and the smallest float that will take your bait to its destination. Excess rigging will scare away wary fish, interfere with your "feel" for what your bait is doing, and cut down on the enjoyment of the fight. All too often, I see people fishing for trout using six inch long floats with 1/2 ounce of lead. This rig weighs nearly as much as the trout! Try a two to three inch float and 1/8 ounce split shot. I think you'll find the smaller rigs make fishing easier, more fun and more productive.

### Natural Baits

An important lesson in the choice of natural baits for trout was brought home to me on a November day some years ago. A pair of anglers were bottom fishing with pieces of cut fish at the same creek mouth where I was fishing with live shrimp. Each time I put a shrimp on my float rig and let it drift by the point of marsh at the creek mouth, I would catch a small trout. The gentlemen fishing with cut bait had no success at all, and after watching me catch trout after trout for about thirty minutes they left in disgust. I tell this story not to boast (I have been skunked more days than I care to remember), but to make a point: trout prefer **live** bait.

The greatest advantage of live bait when fishing for seatrout is its attractiveness. Few trout can turn

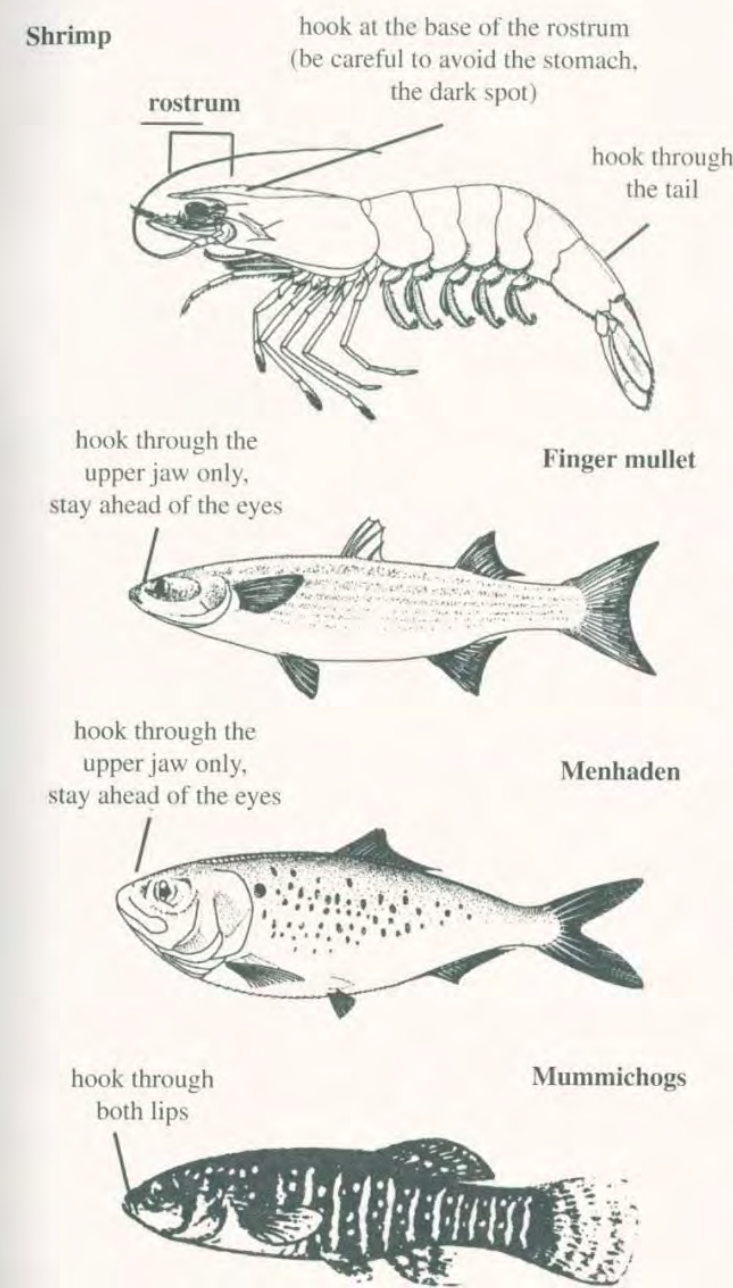


Figure 28. Popular live baits and suggested hooking positions.

down a properly presented live bait, but these same fish often will refuse artificial lures or dead baits. Since live bait presents the trout with their natural food (with natural smell and taste) and comes with its own built-in action, it's generally easier and more productive for the novice to use.

Because live baits are native to the waters fished, the fisherman can catch his own with a cast net or minnow trap, making them very economical.

The disadvantages to using live bait are that it can sometimes be difficult to catch and keep alive, and tends to be more messy than artificial lures.

The most popular live baits for trout are small mullet (often called "finger mullet" because of their size), menhaden, mummichogs (mud minnows), and shrimp (Figure 28). Small spot, silver perch, pinfish, and other fishes will occasionally be caught in cast nets and can also be used for bait.

The best baits for average trout are from two to four inches long, but bigger baits can be used when fishing for larger trout. Mummichogs and shrimp generally don't attain a size that is too big for trout, but menhaden and mullet can.

Generally, the decision of what bait to use will be based on what's available in the water to be fished. Not only will the most abundant bait be easiest to catch, it will usually also be the trout's favorite at the time. Trout, like any predator, don't work any harder than they have to: they eat what's abundant. When faced with a possible choice of live baits, the angler should know the specific attributes of each.

Most anglers, when they think of bait, think immediately of shrimp. There is no question that few trout can pass up a live shrimp. The biggest problem with shrimp is that very few other fish will let them pass either. If pinfish, spot, or other bait thieves are around, then it becomes difficult to keep a shrimp on the hook long enough for a trout to find it. This might be a good time to try one of the bait-fish.

Bait-size shrimp aren't always available. The few shrimp that are present during winter are found in deep water. In spring and early summer, the year's crop of shrimp has not yet grown large enough to be used as bait. During late summer and fall, they can be caught along the banks of creeks with a cast net. (They are most concentrated and easiest to catch around low tide.)

When rigging shrimp, remember that they almost always swim to the bottom. If you want your bait to stay near the surface or away from snags on the bottom, then you'll need to use a float. Live shrimp are hooked through the tail or through the head at the base of the rostrum or "horn" (be careful not to penetrate the dark spot, the shrimp's stomach, or it will die).

In the late spring and early summer, when small menhaden are common in South Carolina estuaries, trout feed upon them with gusto. At this time, a live "pogy," as menhaden are sometimes called, is a hard bait to beat. Menhaden are schooling fish and since they are not sold in bait shops, they must be caught with a cast net. The best way to find menhaden is to look and listen for them as they flip at the water's surface. A few tips: menhaden are easiest to catch in water less than fifteen feet deep using a fairly large (6 foot diameter or larger) fast-sinking cast net. They also require a lot of aeration or water exchange to stay alive, and survive best in round or oval containers.

From late June through fall, small mullet are seemingly everywhere in shallow water along our coast, and the trout feed heavily on this abundant prey. Locate finger mullet by spotting the V-shaped wakes that their schools make on the water's surface as they swim near the bank. Both mullet and menhaden tend to stay near the surface, so they can be "live-lined" (fished without weight or float) without the fear that they will often become fouled in bottom snags. Add a split shot or two to get the bait deeper if desired.

Mud minnows (mummichogs) are good baits because of their dependability and hardiness. Even when all other baits are extremely hard to catch, mud minnows can be found at low tide in most small marsh creeks. They are also one of the easiest baits to keep alive, requiring a minimum of water exchange or aeration. All that's needed to gather enough mummichogs for a day's fishing is a minnow trap and a few hours to soak it. Bait for the trap is not absolutely necessary, but a bit of raw meat, fish or shellfish (a cracked crab works well) will lure the mummichogs into the trap more quickly. Mummichogs always head for cover on the bottom, so be careful to cast them clear of the snags or fish them under a float.

All of the bait fishes can be hooked in the nose. For mummichogs, just pass the hook through both lips from the bottom up. For mullet and menhaden, open the fish's mouth and hook through just the top jaw, again from the bottom up. Some anglers prefer to hook the bait fishes crosswise through the nose, but I've found that this allows the hook to turn and stick back into the bait and kill it. Either way, stay

just in front the leading edge of the eyes or you'll kill the bait.

### Artificial Lures

One October evening a couple of years ago, a friend, Phil Maier, and I were fishing together at one of our favorite spots near an oyster bar. Phil loves to fish with live finger mullet, and for good reason: they're excellent baits. This night, though, the mullet were not only a bit bigger than we normally use but also were hard to catch. Phil would spend fifteen or twenty minutes with his cast net hunting bait. When he had two or three mullet he would fish with them until he ran out and then walk off to chase bait again.

Meanwhile, I was fishing with plugs. Needless to say, I didn't have to take breaks to look for bait. Every bait that Phil cast out was quickly hit by a large trout. As we know, though, not every hit results in a landed trout, especially when the bait's a bit big. I was getting fewer hits on plugs, but I hooked and landed most of the fish that bit. At the end of a couple of hours (I had fished continuously, Phil had spent most of the time chasing bait) we had each landed and released four nice trout. The moral of the story is that live baits will often result in more hits, but artificial baits catch trout, too.

Artificial baits have some advantages over natural bait. Artificial bait can be very convenient. The angler doesn't have to spend the time and effort to catch and maintain live baits. He can just grab his tackle box and head for the water. Also, since fishing is not an inherently neat sport, not everyone wants to deal with the added mess of bait. Trolling or casting with artificial baits can effectively search a large area.

More fish are fatally hooked with natural bait, which becomes important when the fish are to be released. With natural baits, the fish is allowed to actually eat the bait. Anglers try to set the hook before the fish swallows the bait, but are not always successful, and the fish are sometimes hooked in the throat or gills. With artificial baits, the fish is hooked immediately during the strike or not at all, thus hook related fatalities are rare.

Most plugs and many other lures are equipped with treble hooks. Artificial lures meant for use in

salt water come with rust resistant hooks of cadmium plated and tinned steel, but those not originally intended for salt water have chrome plated or bronzed steel hooks that will rust quickly. Even cadmium plated and tinned hooks will rust after a season or two.

Replacement treble hooks are available in major fishing tackle shops or from mail order catalogs specializing in saltwater terminal tackle. (Stainless steel treble hooks are generally not available.) Treble hooks can be bought with "open eyes," meaning that the eye of the hook is split. The new hook is placed on the lure and then the eye is crimped shut with pliers. Alternatively, replacement treble hooks can be held in place with stainless steel split rings. Don't use substitutes like chromed brass or plain steel. Stainless steel rings are stronger and won't rust. In any event, replace the hooks on your lures if they appear corroded. Rusty hooks are dull and weak and can break under strain (such as when you are fighting that fish of a lifetime).

All hooks should be kept sharp. Trout may not have mouths as hard as tarpon or even largemouth bass, but sharp hooks will still catch more fish than dull ones. Dull hooks don't penetrate as easily and lead to missed strikes and lost fish. Invest in a small sharpening stone or file and touch up the hooks on all of your lures a couple of times each year, if not more often.

Lures come in a great variety of styles and brands. If a fisherman tried to own a few of each, he'd need a very large truck to transport his tackle box. I have chosen the ones that seem to work for me. (Part of the determinant of success may be confidence: if you don't believe that a lure will catch fish then it probably won't.) Different lures run at varied depths, and two lures that look very similar may behave quite differently in the water.

A well prepared angler might own a variety of floating plugs that run at depths ranging from the surface down to about five feet, plus sinking plugs and grub-jigs that can be fished at almost any depth (Figure 29). From one day to the next, the trout might feed anywhere from the surface down to the bottom, so it pays to be able to place a lure at any level.

Plugs are plastic or wood bodied lures with treble hooks attached. They come in various col-

ors, the choice of which probably depends more upon the fisherman's taste than the fish's. Start with something light, something dark, and maybe some bright colors for murky water (or for those times you want to shock the fish into striking). A few good choices are white; silver with a black or blue back; gold with a black back; a "baby bass" (mottled dark green) or "shad" finish (medium to dark grey); and maybe fluorescent pink or "fire tiger" (orange, green, and yellow, with black streaks). Plugs are usually rather expensive (up to \$6 or more apiece), but they will last for years if cared for and not lost. I've found that models from three to six inches long catch the most trout.

Lipped swimming minnow plugs are long, thin lures (roughly round in cross section) with a molded or glued in plastic "lip" on the underside of the nose. The lip causes the plug to dive and wiggle when retrieved. The eye to which the line is tied is usually at the tip of the lure's nose. Examples include the Rebel minnow, Rapala minnow, Cordel Redfin, Bomber Long-A, Storm Thunderstick, and Bagley Bang-o-Lure. Most of these plugs are meant to imitate a minnow, and they include realistic silverside and mullet imitations. The Storm Thinfin and Bomber Speed Shad are deeper bodied and somewhat flattened swimming plugs. They resemble menhaden, spot or other laterally compressed baitfish.

Many swimming plugs are available in floating and sinking, as well as one-piece or jointed ("broken-back") models. The jointed models have more action (ie. a stronger wiggle) than the one-piece models. Floaters present the advantage of staying above the bottom and rarely snagging on rocks and oysters. Sinking models are useful when fishing in deeper water or in heavy current. Depending on brand and model, floating/diving plugs will fish from the surface down to a few feet (deeper for models with larger lips).

It may seem obvious to some people, but it's worth mentioning that there are ways for the fisherman to control the depth of a lure. With floating/diving lures, the slower the retrieve, the shallower it will run; reeling faster will cause the lure to dive deeper. Most sinking lures behave just the opposite: a slower retrieve gives the lure more time to sink, a faster retrieve keeps it near the surface. The excep-



Rebel™ Minnows



Bomber™ Ratl "RRR" "A"



Bucktail



Rapala™ Jointed Floater



Rapala™ Ratl'n Rap



Curly Tail Grub



Rebel™ Jointed Minnow



Rebel™ Pop-R



Shad Style Tail



Cotton Cordell™ Red Fin



Jigheads



Mann's™ Sting Ray Grub



MirrOlure™ Tiny Trout



Tout™ Shrimp Tail



Mister Twister™



Cotton Cordell™ Ratt'l Spot

tion involves sinking plugs with a large diving lip. Reeling them faster will also pull them deeper. The position of the rod during the retrieve will also affect lure depth. Normally, it is best to keep the rod in a low horizontal or slight downward position, so that you are ready to set the hook when a fish strikes. Pointing the rod high in the air will keep the lure running shallower than usual. Conversely, pointing the rod down or even putting the tip in the water will help the lure to run deeper.

Mirrolures, Bagley Finger Mullet, and other similar plugs are fairly short stout lures without a lip. The line tie-in eye is generally on the top of the lure's nose or sometimes at the tip. These lures are also nearly round in cross section and are apparently meant as imitations of mullet and other similar heavy-bodied baitfish. They have little or no built-in action and are often fished in jerks, by periodically sweeping the rod tip to the side while retrieving. Most lures of this type sink, and some companies offer models of different weights that sink at different rates. Some brands also offer floating/diving models which usually stay within about a foot of the surface.

Rattling-shad type lures are often used to fish for largemouth bass. Examples include the Cordel Ratt'l Spot, Rapala Ratl'n Rap, Bagley Shad-a-Lac, Bomber Ratl 'R', and Bill Lewis Rat-L-Trap. They are designed to wiggle or vibrate quickly when retrieved and produce a loud rattling sound which is thought to attract fish. The sound is produced by one to several small metal balls within the plastic body of the lure that rattle around as it swims. All are fairly fast sinkers. They are not very commonly used for trout, but some people report having had good luck with them.

Poppers are floating plugs with a cupped front that splashes and creates a popping noise when the lure is pulled through the water. Most South Carolina anglers don't think of surface plugs as standard trout fishing lures, but they are often used by fishermen farther south (in Florida and on the Gulf coast). When trout are feeding on finger mullet or other baits at the surface, poppers can be effective and lots of fun. Stickbaits or other surface plugs might also be worth a try.

Jigs consist of a lead head molded to a hook which is then adorned with a rubber tail (resulting in

a grub-jig), hair (bucktail jig), or feathers. These days, rubber tails have all but supplanted bucktails and feather jigs. Rubber tails are available in curly forms that flutter and wiggle through the water, paddle tails that wag a bit, and tails that are molded in the shape of a fish or shrimp.

Some manufacturers are starting to build tails that contain bait scents and flavors to attract fish, as well as tails that will slowly biodegrade, so that they will not pollute the environment if lost. The environmental hazards of lead are beginning to cause concern, too. It may not be long before we all use jig heads and sinkers made from a lead substitute. One quarter ounce lead heads are probably the most common, but you might want to use heavier or lighter jigs in deep or shallow water, respectively.

Tails are available in a staggering array of colors, both solids and complex combinations, with and without glitter. Some of the favorites for spotted seatrout in South Carolina are dark green, smokey grey, chartreuse (good in murky water), white, and white or grey with a red or pink tail (all with or without glitter). Grub jigs are fairly inexpensive: a handful of jig heads and many tails can be had for a few dollars. They can be purchased together or separately. Often the soft rubber tail will be chewed up or wear out before the head, so it's wise to buy more tails than heads. A new tail is simply threaded onto the hook and positioned on the jig head.

Jigs are very versatile lures and can be extremely effective in the hands of a skilled angler. They can be cast and bounced or crawled along the bottom, or pulled through midwater. Jigs are also a very popular lure for trolling. Just cast your jig out behind the boat and hang on (or place the rod in a holder) while you run the boat slowly near the bank. You can adjust the depth at which the jig runs by adjusting the length of line that is let out, boat speed, or the weight of the jig head. Letting out more line, trolling more slowly, or using a heavier jig will all result in fishing deeper.

If you are looking to try something new or different for seatrout, consider spinners. These standard lures of freshwater fishermen have a straight wire shaft and revolving blade. Just cast one out and reel it back. A friend told me that he had caught trout on spinners, so I tried it myself, and I've taken

Figure 29. Some popular artificial baits.



a couple of trout on them, too. This shouldn't come as a surprise, since the flutter, flash, and vibration of spinners have always made them deadly for a variety of fish. If you intend to add spinners to your saltwater arsenal, remember that the bronze hooks with which most are equipped will quickly rust away. Replace them with rust resistant single or treble hooks.

## FLY FISHING

The popularity of saltwater fly fishing has been growing at a tremendous rate over the last several years. Fifteen years ago there were just a very few "oddballs" fishing for spotted seatrout or spottail bass with flies in South Carolina. Legions of modern fishermen are responding to the challenge and unique approach afforded by fly tackle, and today it's not unusual to see several fishermen casting flies in the course of a day's outing.

I feel obliged to double-up on my disclaimer, at this point. I am a relative newcomer to saltwater flyfishing, so parts of what I am about to relay come from theory rather than experience.

While dealing with lures and baits, and what most of us consider "conventional" fishing tackle, I've assumed that the reader had at least some familiarity with spinning, spin-casting or casting gear. Since this may not be a fair assumption when dealing with fly-fishing tackle, let's start from the very beginning.

The fly outfit consists of a rod and reel, fly line (with backing and leader), and the fly itself. When casting any outfit, the angler imparts the energy of the cast by swinging the rod. When casting conventional gear that energy is transferred to the lure or bait which then sails through the air dragging the line behind it. The energy in fly casting, though, is transferred to the line. The line is what is cast. It carries the fly to its destination. The leader links the fly line and the fly. It keeps the thick and bulky fly line away from the fly (and thus, hopefully, the fish).

Since fly lines are short (usually around 90 feet), "backing" is attached to the tail end of the fly line and thus lies under it on the reel. If a strong fish makes long runs, the backing gives the angler ad-

ditional line with which to work. The reel simply holds the line and backing coiled upon a spool. The reel functions in fighting a fish, but not in casting or in retrieving the fly.

When casting, the required amount of line is simply pulled from the reel and coiled at the angler's feet (or sometimes in a basket or bucket). The fly is retrieved by pulling in line by hand ("stripping" in line). Small fish can also be brought in by stripping in line. Larger fish are fought from the reel: any loose coils of line are either wound back onto the reel or are let go through the guides, and the fish is then retrieved by winding line onto the reel.

Fly fishing, like any other approach, offers strengths and weaknesses. Flies can be produced to accurately imitate any baitfish or even crustacean, and many fly fishermen enjoy tying (ie. making) their own flies. Catching fish on a fly that you made yourself imparts an added feeling of accomplishment. It also allows for infinite customization of the lures and can help to keep the cost down for people like me who are compulsive tackle collectors. Also, flies can be presented more gently than any other lure or bait, which can be an advantage when fishing for wary fish in shallow water.

Casting a fly tends to be more work than casting any other lure or bait. To be successful, the fly fisherman can not rush: he must learn patience, attention to his or her surroundings, and subtlety. The mere attempt will often make an angler a better fisherman with all gears. Many anglers turn to fly tackle for the challenge and to add another dimension to their sport.

A skilled fly fishermen will be able to hold his own against others with spinning or casting tackle in most situations and outfish them in many others. Most fishermen would admit, though, that for the novice, fly tackle represents a self-imposed handicap, because it's harder to cast.

If you are new to fly fishing and want to get started, the best advice I could give you is to go to one of the large specialty fishing shops (not a discount or department store) that handles fly tackle and ask the advice of an expert. Also, fly fishing clubs exist in some areas that can help you to make contact with experienced anglers who can offer

instruction in fly casting and local fishing areas. No one wants to give away their secret hotspots, but they will generally point you in the right direction.

It might be worthwhile for a novice to hire a guide who specializes in fly fishing to show them the ropes. While guides are not inexpensive, they can save you from years of floundering (pun intended), and you can obtain a great deal of experience in a single fishing trip.

### Fly Rods and Reels

Quality fly fishing tackle is somewhat more expensive than conventional gear. While it would not be difficult to spend up to a thousand dollars on a fly rod and reel, it's not necessary. A quite passable graphite rod can be had for near \$100 and fiberglass rods are less expensive (top of the line rods run in the neighborhood of \$500).

Since trout are not known for lightening-fast, long runs, a simple reel capable of holding the line and 50 to 100 yards of backing is adequate. A drag is not really necessary for trout. The angler can simply apply light pressure to the edge of the reel spool to slow a running fish. Remember that the reel should be corrosion resistant. You should be able to purchase an adequate reel for under \$50. However, if you intend use the outfit for other larger species, then you might want to purchase a mid-grade reel with a drag and slightly greater line capacity. Such reels can be had for \$100 to \$200. (The most expensive fly reel I've seen so far was over \$800.)

### Lines

The size or strength of fly tackle is labeled by "weight," corresponding to the weight of the fly line. Without getting into the technical measurements and distinctions, the lower the "weight," the lighter the outfit. Modern outfits range from 2 weight, considered ultra-ultralight even for small freshwater streams, to 14 weight that is used for marlin and tuna. When choosing the weight outfit to purchase it's important to keep in mind the size of the flies that will be cast and the conditions under which they'll be fished. Heavier weight line (and thus heavier rods and reels) are needed to cast large or highly wind-resistant flies.

The size outfit used is dictated by the size of the flies used and the expected prevailing conditions (wind), as well as the size of the fish sought. For spotted seatrout, probably the best starting point would be a seven or eight weight outfit. This weight outfit would have plenty of strength to handle any trout and most flies. Given that some seatrout flies tend to be a bit bulky, and that you are likely to encounter windy conditions around salt water, the eight weight might be best.

Fly lines today are much superior to those of years past. The use of modern plastics and high-technology lubricating coatings produces easier casting and longer lasting lines. Although fly lines are manufactured in many specialized tapers, the three basic line types are level, double taper, and weight forward.

A level taper line is even in thickness from end to end. A double taper line is thicker in the middle, but becomes thinner at each end. A weight forward line has the thickest, heaviest portion near the front, closest to the fly. Weight forward lines are somewhat easier to cast for longer distances or against the wind and are thus preferred for salt water.

Fly lines are available in models that float or sink at different rates. Obviously, a sinking line makes it possible to present flies deeper in the water. A third option is a floating line the last few feet of which sink: a "sink-tip" line. Most trout fishing situations can be handled with a floating line, though with experience you may want to add sinking or sink-tip lines to your arsenal.

Backing is readily available from suppliers that carry fly fishing supplies. Quality fly-line backing is braided from synthetic material, is low stretch, rot resistant, and has a high strength to diameter ratio. Most is made from dacron. It's essential that backing be rot-resistant since, since it's frequently wet and stays on the spool for long periods. (It is a good idea to remove it from the reel at least once per year to check it and let it dry).

### Leaders

Since fly leaders are the link between the fly line and the fly, they are usually tapered to transfer the energy of the cast more smoothly and efficiently. Knotless tapered leaders are available commercially,

but most anglers tie their own from sections of monofilament joined with surgeon's or blood knots (pages 32 - 33).

A good starting formula for a tapered leader is 4:2:1 (Figure 30). According to this guide the "butt section" of the leader (the part closest to the fly line) should be four times longer and four times stronger than the "tippet," and the mid section should be one half as long and one half as strong as the butt. For example, you might construct a seven foot leader from four feet of forty, two feet of twenty, and one foot of ten pound test monofilament. This is just a guide, however: with experience you will want to vary the strengths and lengths to suit the conditions under which you fish. I have also seen a formula of 4:3:2 suggested. I often fish with four to five feet of 30 lb. test followed by two to three feet of 15 or 20

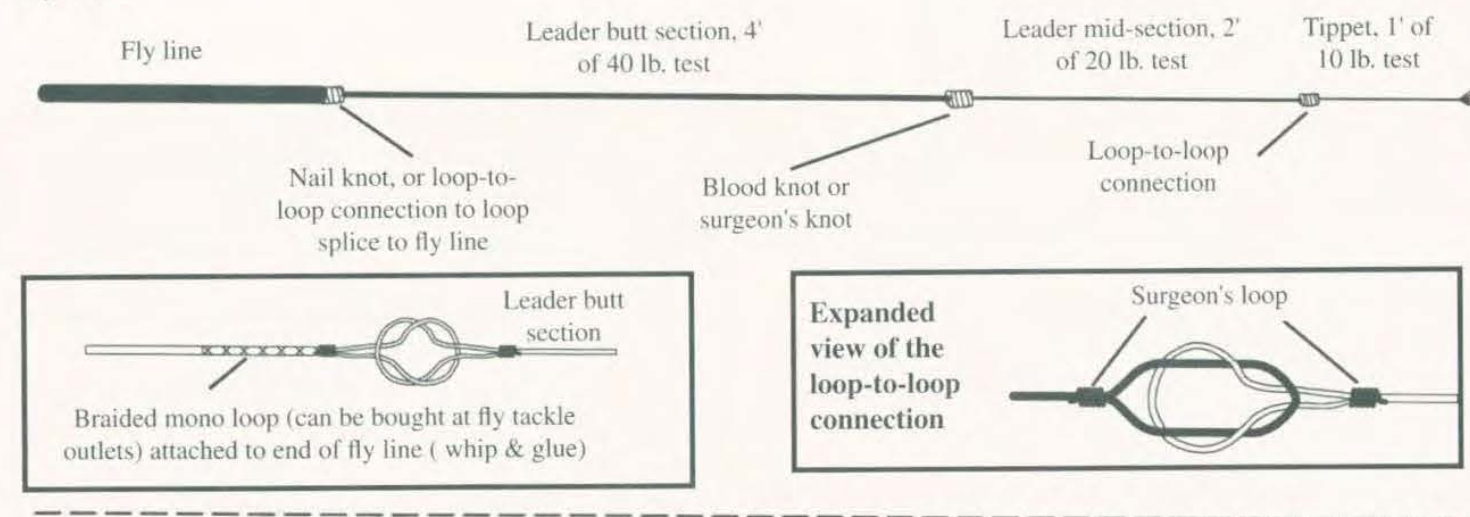
lb. test followed by a two foot tippet of 12 lb. test.

Since the fly is usually tied to the tippet and this is the lightest section, it is replaced much more often than the rest of the leader. Tying a small loop in the end of the butt or mid-section and in the contiguous end of the tippet and joining them loop to loop allows for quick and easy replacement of the tippet without having to cut or retie the butt (Figure 30).

Leader length affects fly depth and action. When fishing with a floating line, a longer leader will allow a sinking fly to reach greater depth, while a shorter leader will hold the fly nearer the surface. Similarly, a short leader will allow a sinking or sink-tip fly line to pull the fly deeper. Typically, wary fish call for longer leaders and lighter tippets.

A short piece of heavier monofilament or wire

### Fly Leader



### Nail Knot

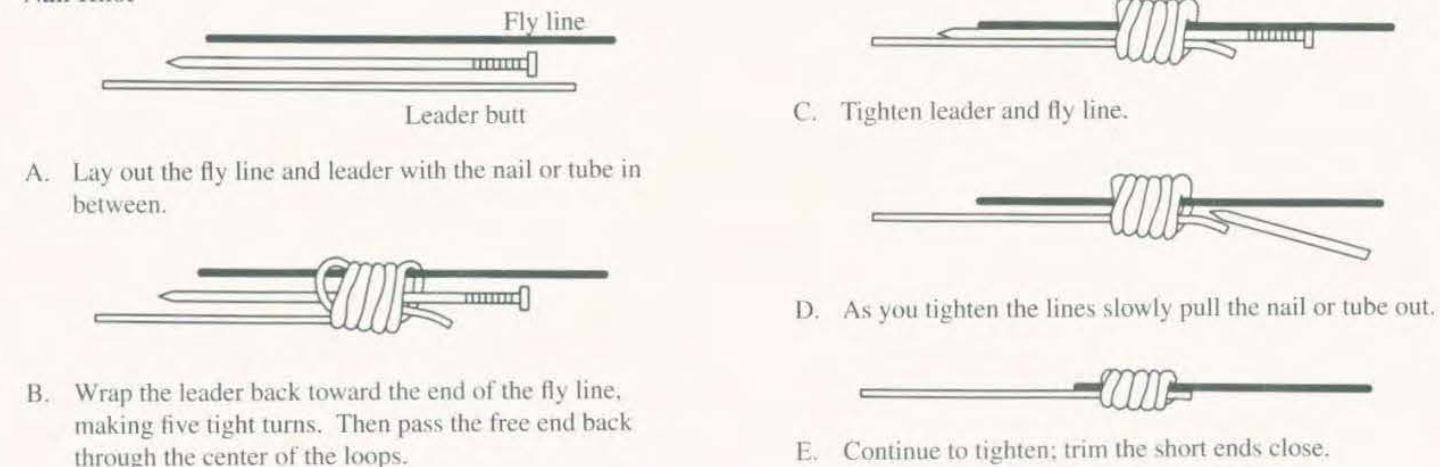


Figure 30. Guide for the construction of a fly leader.

can be added before the fly, as with conventional gear, to protect the tippet against sharp objects or sharp-toothed fish.

The tippet is the weakest link between the fisherman and the fish. It is the breaking strength of the tippet that determines the strength of the whole backing/line/leader system and thus it is used to determine fly rod record class categories, similar to line class categories for conventional tackle. Also, making the tippet the weakest link insures that any breaks will occur there (rather than in the backing or fly line) so that just the fly will be lost, not the whole fly line.

### Flies

All flies are basically just bits of feathers, hair, and other materials tied on to a hook with thread, usually secured with some lacquer or glue. Traditional materials include various chicken feathers and some more exotic feathers such as jungle cock, pheasants, etc. and deer tail hair ("bucktail") and other hairs and furs. Modern fly tiers use all of these natural elements and also synthetics such as foam, polypropylene fluff, and artificial hairs.

Freshwater trout and salmon flies are referred to by "pattern." For each fly, the precise tying method and materials have been set down by the fly's originator or by generations of preceding fishermen. Most saltwater flies, however, are referred to by types. The distinction indicates that their basic design is known, but the choice of materials, colors, and even variations in size and shape are up to the tier or angler.

Flies and tying supplies can be purchased from better fishing tackle shops and also from a myriad of mail-order catalogs (look for catalog companies in the back of your favorite fishing magazine).

The choice of flies for spotted seatrout is largely a matter of personal taste. If we were to open up the fly boxes of several lowcountry fishermen, while each would have his own secret weapons, a few fly types would recur regularly. Included in this list would be Clouser Deep Minnows, Seaducers, Bendbacks, and Lefty's Deceivers (Figure 31).

The Clouser Deep Minnow is tied sparsely from bucktail or synthetic hair, in such a manner that the hook will ride point up, with lead "eyes" added for



Figure 31. Some popular flies

weight. Seaducers are tied from chicken hackle feathers. The fly's tail consists of feathers, and the body of the fly is made from more feathers wrapped tightly around the hook so that the fibers flare out. Bendbacks are another fly type tied so that the hook rides point up. The point is protected by the hair and feather "wing" so that the fly is nearly weedless. The Lefty's Deceiver is arguably the most widely used saltwater fly worldwide, largely because of its versatility. It is tied with a hackle feather tail and a hair collar. The deceiver is usually tied so that it has a fairly broad, high profile, but is flattened laterally. When tied this way it resembles many deep-bodied baitfish such as menhaden, herring, and shad. It can also be made long and slim to resemble silversides or short, full and round to resemble a mullet.

All of the above flies can be tied in a variety of colors. A good starting assortment might include the following: all white or yellow; a white or yellow base combined with blue, green, or red; and dark colors such as brown or black. I, personally, have had some success with flies that combined white with yellow, and I have heard others say that they swear by combinations of green and white or blue and white. Mylar and other flashy materials can be included in almost any fly for added appeal.

### Tactics

Many salt water fly fishermen are converts from spinning or casting tackle. They are used to simply casting plugs or grubs and retrieving them in order to draw a strike, and they tend to approach flyfishing the same way. These tactics have their place and catch a lot of fish, but if you treat your flies like plugs, then you are missing much of their potential. One of fly tackle's great strengths is its ability to present the lure in a natural and lifelike manner in moving water. In situations with little or no current, the best tactic will often be to cast and retrieve the fly, but moving water calls for some more subtle tactics, such as the "dead drift" and the "wet-fly swing."

The "dead drift" is just what the name implies. The fly is cast into the moving water (often quartering upstream to quartering downstream) and then line is either pulled in or fed out just enough to keep the fly drifting slack with the current. If a belly

(a curve) forms in the line from one portion of the current flowing faster or slower than another, then it may be necessary to "mend" line to keep the drift drag free. "Mending" line is simply a matter of lifting part of the line off of the water and flipping it up or downstream as needed. (If the fly is moved a bit during the mend, don't fret. This darting action will sometimes draw a strike.)

In the "wet-fly swing," the fly is again cast out into the moving water, but then the line is simply held tight. As the current sweeps the line downstream, the fly will be drawn across the flow and down, hopefully simulating the natural swimming action of a baitfish crossing the current. If the cast is made quartering upstream the fly will have more time to sink before it starts to swing across current. If it's cast quartering downstream the swing will start immediately. With practice, you can learn to control the path of the fly by casting to different spots and by feeding and mending line.

The strip retrieve, dead drift, and wet-fly swing should be thought of as points lying on a continuum, not as separate tactics. For example you can feed line into a swing to achieve a presentation somewhere between a dead drift and a swing. Or, during a swing or drift, the fly can be stripped slowly or tugged to make it dart and sag. It's almost always a good idea to let the fly hang and swim in the current for a few moments at the end of a swing or drift. This will sometimes draw a strike. (Spin fishermen take note: all of these tactics can be profitably employed with plugs and other artificial baits, as well as with flies.)

The secret to catching fish consistently lies in the ability to discover the situation the fish are faced with and the way that they are feeding at that time. Are the dominant bait in the area mullet, shrimp, silversides, menhaden, or something else? Try to use the appropriate natural bait or an artificial lure that imitates it. Are the naturally occurring prey fleeing from the trout? Are they being swept along in a current? Are they swimming against or across the current? Are there dead or disoriented baits being swept helplessly along? Sometimes the fish will respond best to a lure or bait which seems to flee from them. Sometimes they will want it to drift freely or swing in a current or remain motionless. Try to **present** the trout with a lure or bait that, at

that moment, is as close as possible to their natural prey in appearance and behavior. Presentation is the key.

Experimentation can also make the difference between an average fisherman and a great one. Each day we start fishing with our own best guess: our favorite lure or bait in a spot where we hope trout are feeding. If, after a while, you don't hook a fish (or even if you do), experiment. Try a change in tactic. Vary the retrieve speed and tempo: seatrout often seem to favor a fast and 'jerky' retrieve, but sometimes they prefer super slow and/or smooth. If you don't catch trout casting toward the bank or the oyster bar, then try casting to the deeper water. Try a different lure: try a lighter or darker color or a larger or smaller lure. Try a different shape or style or action. If you are fishing bait on the bottom, then try the same bait near the surface. Above all, don't fall into the trap of fishing the same way time after time, day after day. It will be more profitable to try to find the right combination for the fish each day, rather than wait for them to respond to your way of fishing. By constantly experimenting, you'll learn more, catch more fish, and ultimately become a more successful angler.

### CLOSING COMMENTS

I don't feel that I can leave any discussion of fishing without touching on the subject of conservation. I am probably "preaching to the choir," but bear with me. If this brief sermon helps the cause even a little bit, then it's justified.

I've learned to accept that many people are irresponsible slob. It only takes a look at any roadside to prove that point. I am especially disgusted, though, when I see fishermen and boaters throwing trash into the water. Frankly, I expect better from fishermen. We are out specifically to enjoy the wild, clean waterways, and yet many of us still throw beer cans and fishing tackle wrappers overboard without a thought.

I'm not asking simply that you not litter, but that we all make an effort to help clean up. If you see trash, pick it up and bring it home with you. If you see others littering, politely suggest that they dispose of their trash properly.

We also need to conserve fish. At present, spotted seatrout populations are in fair shape, but the future is uncertain. It's not hard to add up the factors and predict an outcome: more fishermen every year leading to more fish killed, and more marsh destroyed or degraded through pollution every year meaning less trout forage and less habitat. If we want to preserve productive fishing for the future, we all have to do our part.

Long ago I saw a quote in print which I believe was credited to Lee Wulff (a truly extraordinary salmon fisherman, sportsman, and conservationist) that went something like this: a fish "is too valuable to be caught just once." This comes close to summing up my opinion on the subject. Tag and recapture data have shown that fish can be (and often are) caught several times.

Like many fishermen, I started by killing the fish I caught, and taking them home to eat. Fairly quickly, though, I came to realize that I was not fishing for food. I was fishing for fun. Anyway, for most of us, if we added up everything we spend on boats, gear, gasoline, and fishing tackle, we would find that we are paying a tremendous price for our fish fillets. Buying the fish would probably be more economical. Occasionally I take a fish or two home for supper, but it is the exception rather than the rule.

When the subject of my fishing comes up with new acquaintances, they are often surprised, even shocked, to hear that I go to all of the effort and expense to catch fish and then throw them back in the water. Why? Fishing is a sport, a test, a contest. If I play the game well, pick the right time and place, right lure or bait, and fight the fish well, then I catch a fish: I win the contest. (That's why fish caught by pure luck hold no great satisfaction for me.) Killing that fish doesn't add anything to the sport. All of this is supposed to lead into the subject of "catch-and-release fishing."

Recreational fishermen need to begin to admit that **we** are often the ones responsible for dwindling fish stocks. If we want more and/or bigger trout, then there's only one answer: reduce mortality on these fish. We can't control natural mortality, so that means we must reduce fishing mortality. Because there is no commercial fishery for spotted

seatrout in South Carolina, the only way to reduce fishing mortality is to reduce the number killed by recreational angling.

I can't object to people killing a few fish to feed themselves and their family (as long as they adhere to bag and size limits set down to protect fish stocks for the future). I do object to the fisherman who kills fish to feed his ego. He may justify the exercise by saying that the fish did not go to waste: they were given to grateful friends and neighbors. While that's better than throwing them away, the distribution of the fish was still just another way to show off. This may sound corny, but I appreciate the fish I catch. They give me great enjoyment. It seems unfair to reward them for this gift by killing them. For me, the best part of catching a really good fish is watching it swim away. Try it, I think you'll like it.

## SUGGESTED READING

(Some relevant and/or related books.  
Alphabetical by title)

Baits, Rigs & Tackle by Vic Dunaway

Fishing for Weakfish and Seatrout by William A. Muller

Fishing the Flats by Mark Sosin and Lefty Kreh

Fishing the Southeast Coast by Donald Millus

Fly Fishing in Salt Water by Lefty Kreh  
The original work on saltwater fly fishing; still the standard by which others are judged.

Inshore Fly Fishing by Lou Tabory  
On saltwater fly fishing in the northeast, but contains a lot of good information on saltwater fly fishing and on fishing strategy in general.

Practical Fishing Knots by Lefty Kreh and Mark Sosin

Practical Fishing Knots II by Lefty Kreh and Mark Sosin  
Everything you'll ever need to know about fishing knots.

Speckled Trout by A. C. Becker

Striper Moon by J. Kenney Abrames (name sp?)  
If you'll tolerate one more title on striped bass fly fishing in New England, this a fantastic little book on fly fishing tactics, theory, and more. It's relevant to much wider applications: to other fishes, areas, and tackles. (Read the book and pretend, in your mind, that he is writing about spotted seatrout instead of striped bass, and you'll learn a lot about fishing.)

Tackle Care by C. Boyd Pfeiffer

The Trout Book by Frank Sargeant

Plus numerous periodicals, including  
Saltwater Sportsman, Carolina Fish and Game, Saltwater Flyfishing, Flyfishing in Salt Waters, etc.