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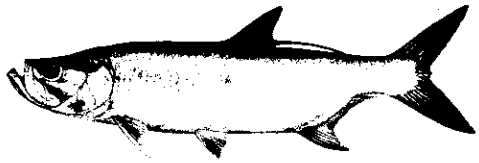
July 1, 2004 Volume 28, No. 7

SILVER KING



The Tarpon, *Megalops atlanticus* symbolizes saltwater sportfish more than any other species. Although it is eaten in other countries, it has never had any food value in the U.S., and probably never will. It is fished solely because of its spectacular fighting abilities. At the 2004 meeting of the Louisiana Chapter of the American Fisheries Society in Baton Rouge, biologists William Dailey made an interesting presentation on the tarpon fishery in the southeastern United States.

He noted that in spite of the fishes' glamour, very little biological monitoring data exists at either the state or federal level. Even catch data from fishing rodeos is difficult to use. Several major tarpon rodeos are no longer held. Data from the Grand Isle Tarpon Rodeo, the oldest rodeo is missing for the years 1966-1973. Also, the emphasis in the tarpon fishery has shifted to catch-and-release. At the Grand Isle Tarpon Rodeo no more than 15 tarpon have been brought in since 1988, when 38 were landed.

Data on catch per day of fishing is also difficult to compare over time. Tarpon were the premier big game fish 25-40 years ago. Now other fish, such as tuna, hold the spotlight.

From the perspective of landings of large fish, the fishery appears healthy. Three state records, Louisiana (230.0 lbs), Alabama and Georgia, were set in the 1990s. At the Grand Isle Tarpon Rodeo, the largest fish have been caught in the last 25 years. Seven of the 10 largest tarpon in the Louisiana Fish Records program were taken in the 1990s, two in the 1980s, and only one fish, in 1979, in the 1970's.

Localized controversy exists though. At the Boca Grande (Florida) Tournament, which bills itself as the World's richest tarpon rodeo, a big decline in the number of large fish landed has occurred since 1999. Some fishermen blame water quality and others fishing techniques, such as the use of break-away rigs.

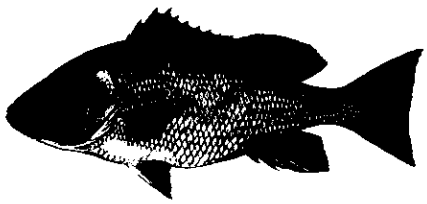
Dailey made 3 conclusions:

1) The tarpon fishery is seasonal and cyclical.
2) The tarpon trophy fishery is healthy.
3) A shortening of the prime tarpon season has occurred. In Louisiana it used to be May to November. Now the fishery exists mainly after June.

Source: Trends in the Recreational Tarpon *Megalops Atlanticus Fishery in North America.* William Dailey, Andre' M. Landry, Jr. and Steve Hein. Silver Anniversary Meeting of the Louisiana Chapter of the American Fisheries Society. February 2004.

NEW RED SNAPPER RESEARCH

Red snapper have certainly become the most researched fish species in the Gulf of Mexico. The Mote Marine Laboratory in Florida recently added even more to what is already known about this species. Red snapper are considered overfished and are managed primarily with annual catch quotas and minimum size limits. Minimum size limits are intended to allow a portion of the population to grow and reproduce.



Obviously, undersized fish caught and released (called bycatch) must survive in enough numbers to make a difference, or the minimum size limit is ineffective. The Mote Lab research focused on fish caught in the recreational and for-hire (charter and headboat) fisheries. The work had four objectives:

1. Determining how much release mortality (death) was caused by hook damage compared to decompression damage.

2. Determining release mortality for fish caught with J hooks compared to circle hooks.

3. Studying decompression effects in the laboratory.

4. Gathering information on movement and migration.

Hook Damage Versus Decompression Damage

For this part of the study, 171 dead or dying red snapper, 20 red grouper, and 4 vermilion snapper were collected during headboat fishing trips off Panama City, Daytona and St. Augustine, Florida. They were brought to the Mote Marine Lab for necropsy (autopsy). Mortality cause for each fish was put in one of three categories — hook injury, barotrauma (decompression injury from reduced pressures as fish were brought to the surface), or other. The "other" category included improper venting, stress, heat, or unknown.

Barotrauma was responsible for 13.5% of all red snapper mortality, while hook injury caused 49.1% of all deaths. When a hook was oriented upward when swallowed, it pierced the anterior cardinal vein. If it oriented downward, it often punctured or destroyed the liver.

Interestingly, some red snappers caught on J hooks that did not seem to be injured and were brought back to the Mote Wet Lab later died. When first caught and for two days after, they appeared healthy. By day three, the fish began to lose their bright red color and refused to eat. They died on day five. Necropsies on these fish showed that the hook had nipped a vital organ, and that the fish had "drop by drop", slowly bled to death.

Since a much higher percentage of red snappers than red groupers and vermilion snappers died from hook injury, the biologists in the study began to suspect that red snappers fed in a different way than the other species. To test this, they tied live shrimp onto diving weights and placed them between video cameras in tanks that held either red snapper or red grouper.

The video showed a distinct difference in how the two species fed. Red snappers typically took a shrimp into their mouth and quickly chewed it two or three times and swallowed it. With this type of feeding, the prey remained in the mouth only a short period of time and a J hook had to be set quickly before the fish swallowed. Red groupers usually took the shrimp in their mouths and held it there for a while before swallowing it whole. This allowed more time for a J hook to be set before swallowing occurred.

Release Mortality for J Hooks Versus Circle Hooks

Research done on other species, including striped bass, juvenile bluefin tuna, sailfish, yellowfin tuna, and Pacific halibut showed increased survival for released fish that were caught on circle hooks. For this study, a total of 5,231 undersize red snapper were caught either on J hooks or circle hooks and were tagged and released. Tag return rates from fish caught with both hook types were compared. Seventy-seven percent of the red snapper tagged and released were from headboats and 21% were from private recreational vessels, with the rest coming from charter or commercial vessels.

The number of tagged red snapper recaptured was 386, with 25 fish being caught more than once. Some red snapper were free over 648 days between tagging and recapture. Recapture rates for red snapper originally tagged on headboats was 5.5% for circle hooks and 7.2% for J hooks. Recapture rates for fish tagged by private boat recreational fishermen was 10.0% for circle hooks and 12.9% for J hooks.

The higher recapture rates for J hook-caught fish indicates that red snapper may be one of the few species, like summer flounder, that do not have higher survival with the use of circle hooks. The researchers did caution that before any management changes were made, that a controlled scientific study with equal sample sizes, treatments and depths should be done on circle hook use and effects.

One problem that the researchers found with release was that bottlenose dolphins took an estimately 20% of the red snapper after release. The dolphins were seen to take some other species, such as sand perch (*Diplectrum formosum*) and gulf flounder (*Paralichthys albigutta*), but they seemed to prefer red snapper. Gray triggerfish (*Balistes capriscus*) were mouthed at times, but never consumed. Released gag (*Mycteroperca microlepis*) and red grouper (*Epinephelus morio*) were visually inspected but otherwise ignored by dolphins. During one trip, the dolphins were very bold and aggressive, to the point of one taking a red snapper that was still hooked. Although the dolphin was not hooked, the fisherman holding the rod was nearly pulled overboard before the 80-pound test monofilament line finally snapped.

The biologists in the study stated that if this habit is widespread and 20% of released red snapper are being taken, "serious steps may need to be taken to address this problem in future management decisions." The dolphins seem to have learned to follow people with fish around the boat until the fish are released. Catching fish on one side of the boat and releasing them on the other side did not help.

Studying Decompression Effects in the Laboratory

Hyperbaric chambers were used in this part of the research. Such a chamber can produce pressures on fishes similar to those found in deep water. Pressure can also be changed while the fish is in the chamber to imitate a fish being reeled to the surface. While in the chamber, the fish can be watched through a clear acrylic window.

Undersized fish to be used in the chambers were caught on headboats and held alive on the vessel. At the lab they were held in quarantine for one month to stabilize them in their new surroundings and to be sure that they were healthy. Both red snapper and red grouper were used. The fish were decompressed in the chambers the equivalent of being caught from depths of 140 feet and 200 feet.

Four chambers were used on four fish at a time. After the fish were removed from the chambers they were vented and put into holding tanks. A necropsy was performed on one fish immediately, a second fish on the fourth day and on a third fish the seventh day. The fourth fish was held for long-term observation.

For each necropsy the skin, eyes and fins of the fish were examined externally. Internally the gills, heart, liver, spleen, swim bladder, stomach, and urinary bladder were inspected. Observations included the position of organs in the body cavity, distortion of organ tissues, gas bubbles, ruptures or tears in any tissues, and hemorrhaging and discoloration.

Red grouper were much more likely to suffer barotrauma than red snapper. The mortality rate for red snapper decompressed from 140 feet was 40% and for 200 feet it was 45%. The red grouper showed 75% mortality at 140 feet, so none were decompressed from 200 feet. In other laboratory trials, red grouper had 50% mortality decompressed from 90 feet, while red snapper showed no mortality.

When red snapper were removed from the chamber, they had swollen abdomens, displaced intestines and their stomachs protruded from their mouths. When they were vented and released into the holding tank they remained upright on the bottom and behaved normally. Red snapper decompressed from 140 feet fed aggressively as little as 4 hours after removal from the hyperbaric chamber.

Red grouper showed the same signs of decompression as red snapper, as well as having their eyeballs popped out of their head (exophthalmia) and heavy internal bleeding. Red grouper placed in holding tanks dove straight down, bounced off the tank bottom and slowly floated to the surface, where they eventually died. The few survivors showed no interest in food up to 24 hours after decompression from 140 feet, although red grouper decompressed from 70 feet and 90 feet fed within 2 hours after removal from the chambers.

Ruptured swim bladders (not the stomachs that stick out of the fishes' mouths) were found in all snappers and groupers decompressed from 140 feet and deeper. Swim bladder ruptures, even large ones, were found to be healed over and the swim bladders working normally by four days after rupture in the survivors of both species.

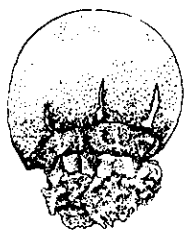
The researchers concluded that hook damage has a greater impact on red snapper survival than depth-related effects. Depth-related trauma has a much more serious effect on red grouper than red snapper.

Movement and Migration

Although not a primary focus of this study, red snapper movement patterns were noted from tag returns. Many red snapper showed a good bit of long-term movement, with 56.6% of all recaptured fish being caught at least one nautical mile from the original tagging site. Fish of all sizes moved, and the size of the fish had no connection with the distance moved.

Source: *Partitioning Release Mortality in the Undersized Red Snapper Bycatch: Comparison of Depth vs Hooking Effects.* Karen Burns, Nicholas F. Parnell and Raymond R. Wilson, Jr. Mote Marine Laboratory Technical Report No. 932. MARFIN Grant No. NA97FF0349. March 5, 2004.

FISHING FOR CANNONBALLS

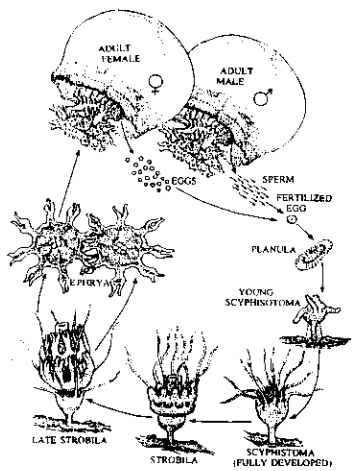


Gulf of Mexico shrimpers have for years considered the cannonball jellyfish or jellyball to be a huge nuisance. These creatures can be found in giant schools in coastal waters, especially between July and December. Often mistakenly thought to be completely at the mercy of tides and currents, cannonball jellyfish are among the fastest swimming and most muscular of the world's jellyfish.

They can swim 3 or 4 miles a day, usually in a coordinated mass moving in the same direction. They migrate to warmer offshore waters when it gets cold. Heavy rains can also drive them offshore to saltier waters. When seas are rough, they dive to deeper calmer waters. They swim by pulsing their bell or "umbrella" and are remarkably good swimmers. Even the disturbance of a boat's propeller can make them quickly dive and scatter, making them hard to catch with a single-rig trawl, unless the boat zigzags.

Their scientific name, *Stomlophus meleagris*, means "many-mouthed hunters". They are eating machines, sucking as many as 65,000 food items of plankton per day into their bell. Oyster larvae can make up the majority of their diet, but larval clams and snails, and small crustaceans are also eaten. When food is scarce, the jellyfish shrink in size, ingesting their own tissues, even though their bodies are only 1% to 2% protein.

In spite of their low nutritional value, other creatures also eat jellyfish, especially the leatherback sea turtle Spadefish, jacks and other species nibble on them and it is thought that the ocean sunfish or mola mola dines on them. When they die and sink to the bottom crabs will quickly feed on them.



Cannonball jellyfish have a complex life cycle. The release millions of eggs and sperm into the sea. Microscopic free-swimming planvla larvae emerge from the fertilized eggs. Planvla are covered with tiny hairs and swim in a spinning motion. After a few days, the planula sprouts four tentacles, changes into a tiny young syphistoma and migrates to the sea floor. Then it develops sixteen tentacles and grows to about the size of the letter "I" in this sentence, Nine days later, it develops into a strobila and buds and sends off tiny snowflake sized "pre-jellyfish" called ephrya. After several days, these develop into small jellyfish that will grow to seven or eight inch adults.

Cannonball jellyfish grow quickly, reaching a 6-inch harvestable size from ephrya in as little as six weeks. Under favorable conditions of salinity and food supply large numbers of adult jellyfish in site of the fact that the adults (known as medusae) live less than six months. This is because the strobila can live on the ocean floor for years or decades, all the while producing new jellyfish when conditions are right. It seems that only a terrible storm or low water salinities disturb them. Then they form into tiny spare-like balls that are swept around until conditions improve. When they do, they redevelop into a strobila.

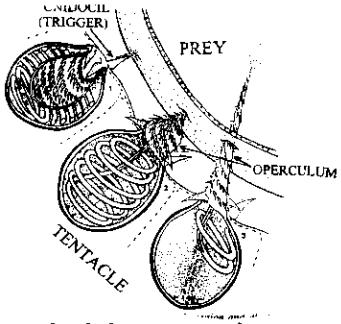
Millions of people in China, Japan, Korea, and Vietnam consider jellyfish gourmet food. Eating them in dishes such as jellyfish cucumber salad or jellyfish in ginger sauce is a tradition, especially on formal occasions such as banquets and weddings. They are also used in stir-fry dishes and soups. Jellyfish are almost tasteless and are eaten for their "crunchy" texture that has been described as "music to the teeth". The flavor in

a jellyfish dish comes from the sauces and condiments they are served with. Apparently, jellyfish are an acquired taste. University of Georgia professor Yao-Wen Huang, long called the "Cannonball King" because of his promotion of jellyfish, says "Most Americans don't like it because it tastes just like rubber bands".

While an Asian market for cannonball jellyfish has existed for several years, Gulf and south Atlantic shrimpers showed little interest in fishing for them as long as shrimp prices were good. While jellyfish only bring fishermen 6 to 12 cents per pound, large volumes can be caught quickly when jellyfish are plentiful. That may be changing. While at least one jellyfish buyer has set up in Louisiana, the highest profile jellyfish catchers and buyers are the Boone family in Darren, Georgia. The Boone family is seen by some as turning yesterday's trash into today's truffle. Others see a darker side. George Marra, director of the Georgia Shrimp Association says that catching jellyfish in nothing less than a sign of desperation among shrimpers.

Cannonball jellyfish were long considered a nuisance because they clogged trawls and their great weight. A net full of jellyfish, which are mostly water, can break blocks, bend rigging and burst nets. Fishermen fishing for jellyfish have to contend with this weight. Unless held in boxes or controlled by baffles on deck, the slippery mass of jellyfish can slide to one side of a vessel and capsize it.

Unlike other seafoods, jellyfish cannot be caught, sized and sold; they must be de-watered. The amount of de-watering done on the vessel influences the price received. Besides the earlier-mentioned ability of the jellyfish to dive and scatter from propeller disturbance, rough weather makes them sink from the surface, so locating them by sight can be difficult and electronics must be used. They seem to appear in greatest numbers on new and full moons, and scatter on low tides and school-up on high tides. Long period's of low salinity can kill them and hurricanes can scatter them so much that the season ends.



Although cannonball jellyfish have one of the weakest stings of all jellyfish, they can sting. Stinging is done with nematocysts, small cells on the tentacles that have a coiled spring in them. When tentacle touches something, the nematocyst instantly shoots out a dart of poison. Usually, cannonball nematocysts are not strong enough to penetrate the thick skin on human hands, but can sting more sensitive skin areas that aren't protected. Antihistamine creams, meat tenderizing powders and bleach can help reduce the pain from jellyfish stings. The worst pain comes from getting stung in the fishermen's eyes. Stung eye should never be rubbed, as rubbing pushes the stinging cell deeper. Rather, the eye should be washed with fresh water or eyewash as quickly as possible. The cannonballs will die after a short period on deck and most of the nematocysts will have discharged or become inactive.

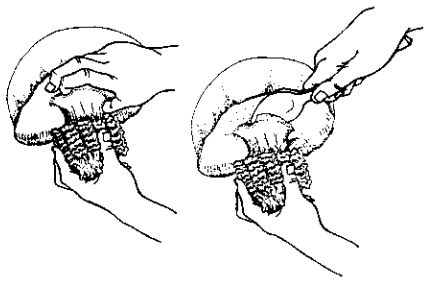
The moment that cannonballs are removed from the sea, they begin to lose water. Although cannonballs are not as likely to spoil as other kinds of seafood, it is

best if ice is spread between layers of jellyfish as they are shoveled from the deck into baskets. If jellyfish are not iced, they should at least be placed in the shade. If left in the sun to long they will loose quality and shelf life.

Once in baskets or bins the weight of the jellyfish themselves will compress them to half of their volume in 2½ hours. Processors typically pay more for de-watered jellyfish and less for heavier catches.

Once off-loaded at a processor, the cannonballs are immediately washed. This is a key step; the more they are churned and washed the better. When the wash water stops foaming and becomes clear and the jellyfish feel rubbery they are ready to dress or at least ice for later dressing.

Completely processing cannonballs takes five to seven days. They are a salted product and can be processed entirely without refrigeration and stored in salt brine. Removing water from the jellyfish is the goal of processing. Live cannonballs fresh from the sea average about two pounds each. Once completely covered and de-watered, they weigh about four ounces each.



Once washed, the cannonballs are spread on tables for processing. The first step is to remove the manubrium (core and tentacles) from the umbrella. This is usually done with a sharpened spoon or knife, although it can be done by hand. A sharp knife is then used to remove the internal organs from the upper end of the manubrium, which is then split lengthwise. The cores and umbrellas are placed in a strong salt solution to remove more water and make them limp. After 3-6 hours in the brine, the umbrellas are inverted (turned inside out) by hand, which flattens them into a disk-shape. The inverted umbrellas are spread by hand, to avoid wrinkling, on a bed of salt and alum. The salt removes more water and the alum hardens and firms the flesh to give it a "crispy" texture.

After 24 hours, they are removed and washed again and drained. Then they are salted again for 24 hours, after which the vats are drained, allowing them to sit in damp salt. More salt may be added, if needed, and the jellyfish are allowed to soak for several days. After being drained, the limp umbrellas are stocked like pancakes for draining with each stack being flipped to allow equal draining.

The cores have received a similar treatment process. Both are then ready for packing. Specifications for packing depend on what each buyer wants Leak-proof containers are usually used, as jellyfish continue to seep water from their tissues during shipment.

Jellyfish are judged on six standards: elasticity, texture, size, color, cleanliness, and yield. Good quality jellyfish are elastic and do not tear easily by hand. They must also have a crunchy texture. Because cannonballs have so much collagen, they usually

easily pass the "crunch test". Sometimes they are too crunchy. Cannonballs average seven inches in diameter compared to the Asian edible jellyfish, which averages 12-25 inches. Cannonballs are thicker, however. The best jellyfish are white and partly translucent. Brown jellyfish are considered spoiled.

Salt-preserved jellyfish are prepared for the table by being soaked in running top water for several hours or left overnight in fresh water in the refrigerator. They are then squeezed by hand to remove salt and alum. The manubrium has a tougher, more dense texture and brings a lower price than the umbrella. The cores are often shredded by machine to make them easier to sell.

Sources: *Methods to Harvest and Process the cannonball Jellyfish.* Jack Rudloe. Florida Department of Agriculture and Consumer Services. 1996 Shrimpers *Turn to Jellyfish to Make Ends Meet.* American Institute of Fishery Research Biologists Briefs. March, April 2003. *Georgia Shrimpers Cash in on an Asian Delicacy.* Dan Chapman. The Atlanta Constitutional Journal. February 26, 2003.

UNDERWATER OBSTRUCTION LOCATIONS

The Louisiana Fishermen's Gear Compensation Fund has asked that we print the coordinates of sites for which damage has been claimed in the last month. The coordinates are listed below:

Loran Sites

29054	47041	ST. BERNARD

Lat. & Long. Sites

29 51.383	89 40.280	ST. BERNARD
29 57.544	89 43.844	ST. BERNARD
30 09.667	89 38.915	ORLEANS

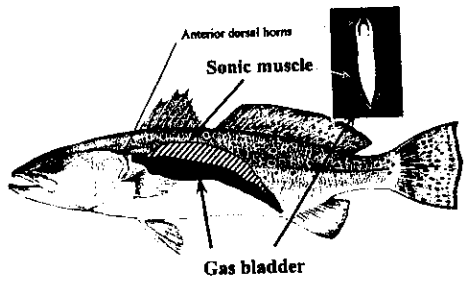
Lat. & Long. Sites

29 13.333	90 27.662	LAFOURCHE
29 16.221	89 38.108	PLAQUEMINES
29 23.246	90 02.426	JEFFERSON
29 24.478	89 59.987	JEFFERSON
29 31.650	92 03.220	VERMILION
29 40.943	90 10.763	JEFFERSON
29 43.378	89 49.763	ST. BERNARD

GRUNTERS

Anyone who has caught more than few speckled trout has noticed that some of them emit loud croaks after being caught. All of the hundreds of members of the drum family found worldwide produce sound during spawning season. Names like croaker and drum recognize the sound-making ability of fish in the family.

Sound is a very effective means of communication in water, much better than sight. Even in the clearest water, light is lost rapidly and almost completely gone by 5,000 feet deep. In the less-than-clear waters such as in coastal Louisiana, light weakens and vision declines in inches. The opposite is true of sound, with sound moving five times faster in water than air. Because of this, it isn't surprising that so many marine creatures — fish, shrimp, barnacles, porpoises, and whales — communicate with sound.



The speckled trout is not known to produce sound except at the time of spawning. Only male trout produce sound, and they do so by vibrating the membrane of the gas bladder with sonic muscles. The illustration at left shows the gas bladder and sonic muscle. The gas bladder is silvery-white and tough enough to interfere with a knife during filleting. The bright red sonic muscles surrounding the gas bladder are easily noticeable if a freshly captured, recently calling male is cut open. The anterior (front) horns of the air bladder contact the skull of the fish.

During courtship and spawning, specks produce four major sound types: dual-pulse short grunts, long grunts, longer series of grunts called multiple pulses, and staccatos, which are long series of many short pulses, sounding almost like knocking.

When males gather in spawning schools, the most common call is the dual pulse (double grunt), with occasional long grunts. The rarest call, the staccato is only heard during the period of maximum sound production, usually an hour or two after sunset.

Mature spawning speckled trout begin to form groups in late afternoon, an hour or two before sunset. Calling begins before sunset, but is usually limited to occasional single dual pulses (double grunts). Only after sunset, do group calls start. Most calls are made from sunset to three hours after sunset, although some calls are heard as late as 1:00 or 2:00 a.m. No male calling sounds are heard in the daytime, except those produced just before sunset.

Scientists can only speculate about the advantages and disadvantages of speckled trout announcing their spawning sites with noise. Apparently, the attraction of females to spawning sites with large numbers of males ready to spawn makes egg fertilization more efficient. The advantages of spawning in noisy groups must be great enough to offset disadvantages, such as the attraction of trout predators like bottlenose dolphin, and bull sharks, which hunt by sound.

Speckled trout calling occurs on all moon phases, but is most common on the full moon or within 3 to 4 days after the moon. The lowest amount of calling is during the last quarter moon. First quarter moon periods have slightly more calling than during the new moon. Calling takes place only from April to October. In contrast to research in Louisiana, which found that calling and spawning took place near passes and channels, research in Indian River Lagoon in Florida showed speckled trout calling took place almost exclusively over sea grass beds. There, calling males avoided waters near passes, and freshwater sources.

When males have spawning on their minds, it seems that they don't feed. Repeated attempts to catch males on baited hooks from calling/spawning groups have failed. Females are caught quite often before and after sunset, but not at the spawning site.

Source: *Sound Production and Communication in the Spotted Seatrout.* R. Grant Gilmore, Jr. Biology of the Spotted Seatrout. Pp 177-195. CRC Press. 2003

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THE GUMBO POT

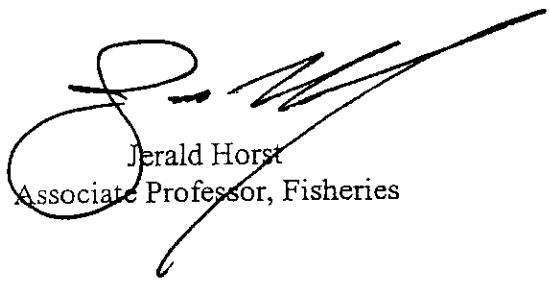
Suzanna's Shrimp Chill

How bout this one? When Suzanne Despaux of Barataria told me about her original recipe for shrimp chili, I was intrigued. I envisioned something dark, loaded up with potent chili powder, maybe with some added adobo seasoning. Instead, what I got was a pleasantly balanced, aromatic dish. It tastes like no other seafood dish that I have ever eaten. I think that you will love it.

- 3 tbsp olive oil
- ½ stick margarine
- 4 cloves garlic, minced
- 2 large bell peppers, chopped
- 2 medium onions, chopped
- 3 stalks celery, chopped
- 2 shallots, chopped
- 1 tsp sweet basil
- 1 tsp salt
- ½ tsp pepper (or to taste)
- 2 cans tomato paste
- 2 cans chopped tomatoes
- 1 can tomato soup
- 3 tsp Worchestershire sauce
- ¼ tsp Italian seasoning
- 1 tsp chili powder
- ½ tsp sugar
- 1 tsp file'
- 1 tsp parsley flakes
- 2½ lb boiled shrimp, finely chopped
- ½ lb very small raw whole shrimp, tails
- rice or pasta

In oil and margarine sauté the garlic, bell peppers, onions, celery, shallots and basil until tender. Add salt and pepper and mix, then add the rest of the ingredients and simmer over a low heat until the gravy is smooth, at least 30 minutes. Add the shrimp and cook for 5-7 minutes, until whole shrimp are done. Can be served over rice or pasta, or by itself. Serves 8 with rice or pasta.

Sincerely,



Jerald Horst
Associate Professor, Fisheries