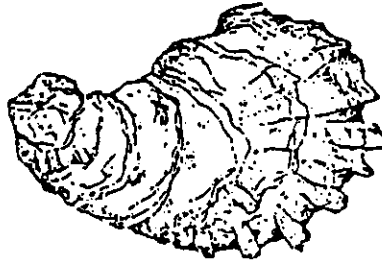




June 1, 1999
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SEA GRANT PROGRAM



LAGNIAPPE

OYSTERS AND BLACK DRUM

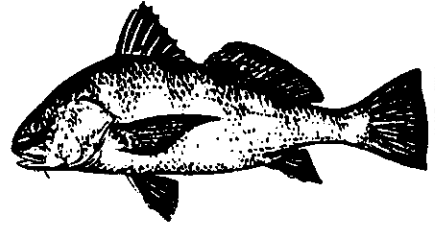
Black drum are well known as oyster predators in Louisiana. In response to a request from oyster farmers, the Louisiana Legislature in Special Session in 1998 passed House Concurrent Resolution 34. It requested that the Department of Wildlife and Fisheries (DWF) develop a program to control and prevent the problem of black drum predation on oysters located on waterbottom leases in Louisiana and to assist the leaseholders in dealing with populations of black drum that appear to be expanding.

DWF staff prepared a 22-question survey form which was mailed to all oyster lease holders in Louisiana. People representing 27% of the 397,916 acres under lease for oyster culture responded to the survey. Total acreage leased per respondent ranged from 1 to 14,274 acres, with an average of 389 acres.

The first question in the survey asked if the leaseholder thought he had ever experienced black drum predation on his lease. In every parish but Lafourche, the majority of leaseholders answered "Yes". The lower percentage of "Yes" answers (23%) in Lafourche may very likely be due to the fact that Lafourche easily has the largest number of respondents who leased 25 acres or less. These small oyster leases are likely to be recreational leases used only for family consumption.

This is borne out by the fact that Lafourche leaseholders were also the only group that by majority answered "No" when asked if they had bedded (transplanted small seed oysters) oysters in the last year. Bedding of seed oysters taken from seed grounds is a practice conducted mainly by commercial growers. Comparing the answers between the two questions for all the parishes in the survey showed a clear link between the bedding of seed oysters and increased black drum predation.

When asked what percentage of their bedded oysters were lost to black drum, the overall average was 26%. The percentage was highest in Plaquemines Parish (51%) and lowest in St. Bernard and Lafourche Parishes (14%). By lake or bay, the water bodies with highest losses were Grand Lake, Lake Cuatro Caballo, Lake Campo and Bakers Bay at 55%, followed by Barataria Bay with 52%. Two-thirds of the total estimated losses in the state occurred in Plaquemines Parish.



One interesting conclusion from the survey was that the longer the time the seed oysters spent on the deck of vessel moving from seed grounds to lease, the higher the chance that black drum predation would occur. It has been theorized that stressed seed oysters give off a scent or other chemical signal after bedding which attracts black drum.

When asked whether black drum predation had changed in recent years, 47% said it had increased, 15% said it was about the same, 5% said it had decreased, and 33% didn't know.

Respondents to the survey ranked black drum predation as their second worst problem, only behind theft of oysters from leases. Following these two, hooked mussels were listed third, oyster drills fourth, and oilfield/seismic activities fifth.

Source: *Black Drum Predation: Results of a Survey of Louisiana Oysterground Leaseholders. Preliminary Report.* H. Holloway, R. Dugas, H. Blanchet, J. Estrata, and D. Lavergne. Louisiana Department of Wildlife and Fisheries. 1999.

BLACK DRUM BIOLOGY

The black drum, *Pogonias cromis* is a very common coastal Louisiana fish. They grow to large sizes, with the official Louisiana recreational record being 77 pounds caught in 1975, the same year the national record of 113 pounds was caught in Delaware.

In spite of declining landings in recent years, it is still an important commercial species. It is not quite as popular with recreational fishermen. A 1993 recreational saltwater survey showed that speckled trout and redfish are the primary target species for 90% of Louisiana sports fishermen. Flounder came in third, followed by black drum and red snapper. An earlier survey showed that only 3.3% of the recreational catch was black drum.

Black drum are a prolific species, with females producing 11- 60 million eggs each over a 16-week spawning season. Generally, spawning takes place in or near passes and

channels and shallow Gulf waters from November to May, with a peak in February and March. During this period each female spawns 20 to 30 times. Spawning peaks seem to occur at new and full moon phases and spawning takes place in the early evening, one to two hours after sunset.

After being spawned, the eggs are carried seaward by currents until they hatch. Larval (baby) and small black drum then tend to travel inland with incoming tides where they settle out in the marshes to grow.

At 24 to 26 inches and 4 to 5 years of age, they become sexually mature and begin to spawn. Mature black drum form large schools before the beginning of spawning season. Often 20,000 - 60,000 pounds of fish will be in one of these offshore schools, frequently mixed with cownose rays and occasionally with crevalle jacks and redfish. After spawning season these schools seem to break up.

Black drum are long-lived fish with most studies indicating a maximum age of over 40 years and one study in Florida estimating a maximum of 58 years of age.

They feed both during daylight hours and at night, but feeding is less intensive during early morning hours. While feeding, schools of black drum often dredge up the bottom, creating muddy plumes in the water which can be easily seen from the air.

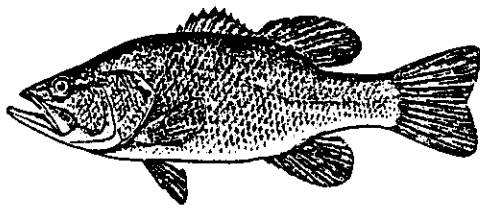
Very few oysters appear in the diet of small black drum under 12 inches long. By the size of 12-16 inches, one Louisiana study showed oysters in 4.5% of black drum stomachs. In fish larger than 16 inches there was a fourfold increase (to 16.7%) in the number of stomachs containing oysters. As black drum became larger, they also consumed more shrimp and large crabs. Research done in areas heavily used for oyster culture showed oysters as the main mollusk (clam, mussel, oyster group) eaten by black drum 27 to 35 inches long.

Black drum have been sold commercially in the Gulf for at least 100 years, with landings of 50,400 pounds on record in Texas in 1897. Although some black drum were produced in Louisiana in the 1800's, the first official records are from 1923 at 3.3 cents per pound.

From 1923 through 1980 Texas led Louisiana as the leading commercial producer of black drum in the Gulf. Between 1981 and 1995, Louisiana led the Gulf states in commercial production. In 1995, Louisiana passed regulations severely limiting the use of saltwater gill nets, and in 1996 and 1997 Texas again took the lead. Louisiana's commercial black drum in 1997 was 1.6 million pounds compared to 2.8 million pounds for Texas. The peak year of Louisiana harvest was 1988 with 8.8 million pounds.

Source: *A Biological and Fisheries Profile of Black Drum Pogonias cromis in Louisiana*. C. P. Luquet Jr., R. H. Blanchet, D. R. Lavergne, D. W. Beckman, J. M. Wakeman, and D. L. Nieland. Fisheries Management Plan Series, Number 2, Part 1. Louisiana Department of Wildlife and Fisheries. 1999.

TROPHY BASS RESEARCH



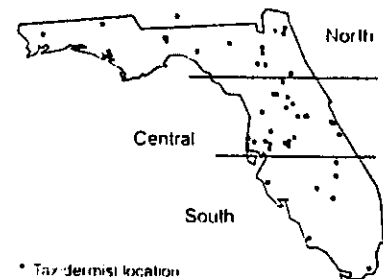
Louisiana, like many other southern and western states, has actively been stocking the Florida subspecies of the largemouth bass for some time now. Because of genetic differences, a higher percentage of Florida bass will grow to trophy size than will other largemouth bass. While Florida bass stocking programs are very popular with fishermen, very little research has been done on age and growth of large trophy-sized Florida bass.

Research to answer these questions was prompted by complaints from Florida fishermen that catch rates of trophy bass were going down. In response, Florida Game and Fresh Water Fish Commission biologists conducted a 7-year study in which they collected otoliths (ear bones) from trophy bass (10 pounds a larger) from 1 south Georgia and 50 Florida taxidermists. The biologists read the growth rings in the otoliths to determine the age of the fish. The taxidermists were also asked to weigh and measure each trophy bass and record information on when and where it was caught. Taxidermists were not asked to sex the fish, as previous research has shown that male bass never grow to trophy size.

The taxidermists provided otoliths from 822 trophy bass from 211 different water bodies ranging from 1 acre ponds to 453 thousand acre Lake Okeechobe. The state was divided into 3 regions to analyze the results of the research. The north region is at about the same latitude as south Louisiana.

Living long enough to get large is important. The average age of the 10 pound trophy bass in the study was 9.7 years, although the age range was 4 to 16½ years old. Other research done on bass population in Florida show that less than one-third of one percent of the bass population was females 9 years old or older. Obviously, few largemouth bass survive long enough to reach trophy size.

Interestingly, the average age of trophy bass in the study was greater the further north in the state that the fish were caught from. Two of the oldest fish, 16 and 16½ years



old came from extreme northwest Florida. An area in north central Florida also produced 7 bass aged 14 or older.

Average weight also increased toward the northern part of the state. This was not due to better growth rates, but rather to the fact the average age was higher in the northern regions. Simply put, older fish are heavier, and average age was higher in north Florida than south Florida.

Growth rates are also very important for producing trophy bass. The average growth rate for the bass in the study was 1-2 pounds per year, but ranged from 0.6 to 2.8 pounds per year. Two percent of the fish in the study showed growth rates of 2 pounds or more per year. Trophy fish under 9 years old showed extremely fast growth.

Water fertility was also very important and its effects were clearly demonstrated by two lakes in northwestern Florida which were fertilized and closely managed. Growth rates in the two lakes averaged 1.3 pounds per year which is higher than average growth rates for other north Florida rates (1.0 pound per year) and even south Florida lakes (1.2 pounds per year).

Finally, year class strength also influenced trophy bass production. A strong year class is a year's successful spawning with high survival that produces a large number of catchable sized fish. The effect of strong year classes was demonstrated by several lakes in the study. In Orange Lake in the north region, 68% of the trophy-sized largemouth bass were produced from two strong year classes produced by high survival when the lake had usually strong growths of the aquatic plant hydrilla. In Lake Kissimmee in the central region, 47% of its trophy bass were produced from one strong year class as a result of an extreme change in water levels due to a lake drawdown. Bass from this year class were more than 3 times more plentiful than from a normal year class.

Over the whole state, 56% of the trophy bass were caught by fishermen in the period of January through March. A breakdown by regions showed some differences. In the south region trophy bass catches peaked December through February, in the central region January through March, and in the north region catches were highest in March and April. These peak harvests matched the pre-spawning and spawning periods for each region.

Management Implications

- 1) Waterbodies with fast-growing largemouth bass are the best candidates for trophy management, since fish can reach trophy size in under 8 years.
- 2) The fact that some fish as young as 4 years old can reach 10 pounds is due to genetics. If fisheries managers can get some of these fast-growing trophy fish, they

could be used as hatchery brood stock. (Louisiana is already doing this with its Louisiana Lunker Bass Program.)

- 3) Protection of largemouth bass with strict harvest regulations is important to allow fish to survive long enough to reach trophy size. Florida placed 24 inch minimum length in some lakes and 18-14 inch slot length in other lakes to manage for trophy largemouth bass.
- 4) Considering the length of time necessary to grow trophy bass, especially in lakes where growth rates are slow, few fish live long enough to reach trophy size. In these lakes, management for trophy fish would overlook a huge portion of the fishery and the lake may best be managed other ways.
- 5) Trophy bass fisheries can take longer to develop in more northern areas than southern areas. On average, it took 2 years longer for largemouth bass to reach trophy size in north Florida compared to the southern part of the state. If a slow-growing, north Florida fish is compared to a fast-growing south Florida fish, the difference could be as much as 12 years. Fishery managers need to consider these growth differences throughout the range where Florida largemouth bass are stocked.
- 6) Management tools such as controlled changes in water levels, and aquatic plant management can be used to produce strong year classes which produce larger numbers of trophy-sized fish in later years.

Source: *Age and Growth of Trophy Largemouth Bass in Florida*. S. Crawford, W. F. Porak, D. J. Renfo and R. L. Cailteux. Proceedings of the Fiftieth Annual Conference, Southeastern Association of Fish and Wildlife Agencies. 1996.

THE AVALANCHE



An avalanche of imported picked crabmeat has entered the U.S. market in the last year. After remaining more or less stable at 16 to 18 million pounds per year, crabmeat imports ballooned to over 26 million pounds in 1998. In 1994, U.S. crabmeat processors produced of the 56% supply in the country. This is now down to 32%.

While industry experts have for several years been predicting an increase in imports from both Latin America and Asia, the big increase in imports in 1998 were primarily from two Asian countries, Thailand and Indonesia.

IMPORTS BY COUNTRY OF ORIGIN

COUNTRY	POUNDS (THOUSANDS)	% OF TOTAL	DOLLARS (\$1000)
Thailand	7,650	41%	34,689
Indonesia	5,218	28%	18,476
Mexico	1,971	11%	9,891
Philippines	910	5%	5,429
China	637	3%	4,300
Venezuela	1,753	9%	4,497
Malaysia	163	1%	1,153
All Others	190	1%	969

In dollar terms, sales of U.S.-produced crabmeat have fallen from \$145 million in 1994 to \$111 million in 1997. The number of U.S. companies processing crabmeat during that same period of time fell from 162 to 137.

CRABMEAT PRODUCTION BY STATE

STATE	1995	1996	1997	% OF TOTAL IN 1997
North Carolina	3,347,545	4,023,389	3,485,112	28%
Alabama	1,849,896	1,975,134	2,034,984	16%
Virginia	2,493,528	1,925,367	1,970,722	16%
Maryland	1,176,331	1,094,436	1,585,896	13%
Louisiana	3,889,555	3,301,227	1,518,338	12%
Texas	433,526	258,019	1,192,559	10%
Florida	302,810	355,559	346,943	3%
Georgia	235,789	173,819	156,322	1%
Other	137,236	134,052	164,828	1%
Total	13,866,216	13,241,002	12,455,704	100%

As the figures in the table above reflect, the decline in Louisiana production of crabmeat accounts for all of the U.S. decline in the years 1995-1997. Louisiana fishermen land 70% of the crabs produced from the Gulf States. Presently very large numbers of these crabs are being shipped to Alabama for processing. Any further decline in consumer

demand for U.S.-produced crabmeat could seriously impact not only the state's remaining processors, but a large number of crab fishermen.

MORE RESEARCH ON MERCURY IN HUMAN DIETS

High mercury levels in fish have resulted in health advisories for eating fish from certain waters in many parts of the United States. Human activities have resulted in concentrating higher than normal levels of mercury in some waters. Mercury is a natural element, but in high concentrations can cause health problems in humans.

A major question is at what levels of mercury concentrations in humans do health problems occur. In an attempt to answer this question, medical researchers studied 711 children of mothers who consumed fish high in mercury in the Republic of Seychelles, an island in the Indian Ocean. There, 85% of the population eats fish daily and levels of methylmercury in their bodies are 10 to 20 times higher than in the United States. Therefore, any health effects of mercury in fish in human diets should be detected in the Seychelles long before they would be seen in the United States.

The children in the study were tested with six nerve development tests involving learning, speaking, reading, mathematics, vision, and social skills until they were 66 months of ages.

The authors of the journal article concluded that the development of the Seychelle Island children in the study was not affected by the high levels of mercury in their diets. They stated that "it would be inadvisable to forego the health benefits of fish consumption to protect against a small risk of adverse effect at the levels of methylmercury found in ocean fish on the U. S. market."

This research does not by itself mean that high mercury levels in fish should be disregarded or that mercury releases into the environment are not harmful. It does, however, raise questions about at what levels should fish consumption advisories be set.

Source: *Effects of Prenatal and Postnatal Methylmercury Exposure From Fish Consumption on Neurodevelopment*. P. Davidson, G. Myers, C. Cox, C. Axtell, C. Shamlaye, J. Sloane-Reeves, E. Cernichiari, L. Needham, A. Choi, Y. Wang, M. Berlin, T. Clarkson. *Journal of the American Medical Association*. Volume 280, No. 8. August 26, 1998.

RED SNAPPER SCIENCE AND MANAGEMENT

No fish species in federal waters of the Gulf of Mexico has received more attention than red snapper. High consumer and recreational use of this fish has resulted in pressure for catch increases. Scientists doing biological status reports of fish stocks often

have to use fisheries statistical models that demand much information. When some research information isn't available, they use assumptions.

Assumptions are basically "best possible scientifically based guesses" (as much as I hate to use the word "guess", I can't come up with a better one). These assumptions may be based on a similar species of fish for which research has been done on or on research on a related but separate topic. Because of the unsure nature of an assumption, most biologists take a cautious or almost "worst case scenario" approach.

For red snapper this has resulted in tight quotas with fishery closures for both recreational and commercial fishermen and requirements for bycatch reduction devices (BRDs) in shrimp trawls to protect young snappers.

Can things change? Yes, they can. Fish stocks recover with time and harvests can be increased. A paper change can also occur when scientists produce findings that call for less cautious assumptions, which may in turn change the outcome from the model and lead to increased harvests.

The Gulf of Mexico Fishery Management Council recently requested the National Marine Fisheries Service to review recent research that may change some assumptions on red snapper biology. The first item under review is the fecundity (egg producing ability) of red snappers in their first and second spawning years. Recent research from Alabama seems to indicate that these young fish produce more eggs than assumed in the models. If this is so, then the actual condition of red snapper stocks is better than currently projected.

Secondly, there seems to be some indication that a population of older red snapper exists further offshore, beyond normal fishing range or that numbers of these older fish are scattered in deep offshore waters in numbers too small to fish for in any one place. The Council has requested that exploratory work begin to sample for these far-offshore stocks. Their existence would also indicate that red snapper stocks are in better shape than now thought.

The next red snapper stock assessment is due to be delivered to the Council by September 15, 1999.

BILLFISH, SHARKS, TUNAS, SWORDFISH

The National Marine Fisheries Service (NMFS) has announced the final version of its amendment to the Billfish Management Plan and the final Highly Migratory Species (HMS) Management Plan. The HMS Plan regulates sharks, tunas, and swordfish in the federal waters of the EEZ. Provisions contained in the amendment to the Billfish Plan are as follows:

- Increases the minimum size for blue marlin from 86 inches to 99 inches, for white marlin from 62 inches to 66 inches, and for sailfish from 57 inches to 63 inches. All minimum sizes are lower jaw fork length, which is measured from the tip of the lower jaw to the fork in the tail.
- Allows fishermen to remove the hook from billfish as long as the fish are not removed from the water. Formerly, fishermen had to cut their line to release the fish.
- Requires the release of all longbill spearfish.
- Requires vessel permits and if selected by NMFS, vessel logbooks.
- Creates a voluntary observer program for charter boats with the provision that the program may become mandatory if NMFS cannot gather enough data with a voluntary program.
- Requires that billfishing tournaments notify NMFS four weeks before the event.

Two provisions were dropped from the draft amendment after public hearings. One would have set a recreational landing limit of one billfish per vessel per trip. The other would have allowed the use of only a single hook per bait or lure.

The HMS Plan is more complex, involving many more species and both recreational and commercial fishermen. Regulations in the final plan include those listed below:

- Begins the process to create a 10-year international rebuilding plan with decreased harvest levels for bigeye tuna stocks.
- Sets a recreational bag limit of three yellowfin tuna per person per day.
- Caps the number of commercial longliners allowed to harvest Gulf and Atlantic yellowfin tuna to the current permit holders.
- Begins the process to create a 10-year international rebuilding plan with decreased harvest levels for North Atlantic swordfish.
- Prepares an international agreement to begin counting discards of dead swordfish due to closed seasons, minimum sizes and other sources against catch quotas.
- Requires the use of an electronic vessel monitoring system on all pelagic (tuna and swordfish) longline vessels that would broadcast the vessel's position at all times

by global position system (GPS) signals. More information on this system will be mailed directly to all permit holders.

- Requires all pelagic longline gear to be marked with the vessel ID number or name.
- Creates voluntary educational workshops for HMS longline operators, with the provision that these may become mandatory later.
- Creates a limited entry program for the commercial swordfish and shark fisheries.
- Provides that the only sharks allowed for harvest in the Large Coastal Shark Group will be sandbar, silky, tiger blacktip, spinner, lemon, bull, nurse, smooth hammerhead, scalloped hammerhead, and great hammerhead.
- Separates the Large Coastal Shark Group into Ridgeback (sandbar, tiger and silky sharks) and Non-Ridgeback (all other Large Coastal Group sharks) Subgroups. Sets a minimum size of 4½ feet fork length for Ridgeback Subgroup species and a commercial quota of 622 metric tons. Reduces the Non-Ridgeback Subgroup commercial quota to 196 metric tons.
- Provides that the only sharks allowed for harvest from the Pelagic Shark Group are shortfin mako, common thresher, porbeagle, oceanic whitetip, and blue sharks. Requires that all oceanic whitetip sharks landed must include fins for identification purposes. Reduces the commercial quota for pelagic sharks by 30 metric tons and creates a separate 30 ton quota for porbeagle sharks.
- Provides that the only sharks allowed for harvest from the Small Coastal Shark Group are Atlantic sharpnose, blacknose, finetooth, and bonnethead. Reduces the commercial quota for small coastal sharks by 80% to 359 metric tons. This is 10% higher than 1997 landings were.
- Sets commercial shark seasons with exact scheduled closing dates rather than by monitoring the catch and closing on short notice when harvests approach the quotas. Any underharvest or overharvest during a season will be adjusted for in the next year's quota.
- Limits recreational fishermen to one shark per vessel per trip with a minimum size of 4½ feet. In addition to the above limit, recreational fishermen may keep one Atlantic sharpnose shark with no minimum size per person per trip.
- Requires that all sharks landed by recreational fishermen have their heads, tails and fins on them. Allows sharks to be bled by a cut at the base of the tail.

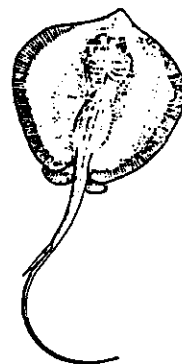
- Counts discards of dead sharks and shark landings from state waters taken after federal waters close against yearly commercial shark quotas.
- Creates a separate quota of 60 metric tons for large coastal sharks captured for display in public aquariums.
- Prohibits the finning of all sharks, including deepwater species not in any of the three groups.
- Requires advance notification to NMFS for all fishing tournaments that have landings of sharks, tuna or swordfish.
- Requires charter and head boat vessels to have an Annual Vessel Permit to fish for sharks, tuna and swordfish.
- Requires charter and head boat vessels that fish for sharks, tuna and swordfish to keep and send in logbooks if selected by NMFS.
- Requires completion of all logbooks within 48 hours (but before off loading) of the day's fishing activities.
- Creates a voluntary observer program for charter and head boats with the provision that the program may become mandatory if NMFS cannot gather enough data with a voluntary program.

The rules listed above are the major ones, but others do exist. For a complete list of all of the changes, fishermen may consult the NMFS Internet web site at www.nmfs.gov/sfa/hmspg.html.

STING RAYS

Four species of sting rays live in coastal Louisiana waters. Sting rays have the well-founded reputation for inflicting very painful and slow-to-heal wounds with their bonelike barb or barbs (some have more than one). Shrimpers must deal with them when they sort their catch. Hook-and-line fishermen often hook or snag them, and surf fishermen run the risk of stepping on them.

It is simpler and safer to cut the line rather than to try to unhook a stingray. This may be hard to swallow if you snag one with a \$5 bottom-running lure. Sting rays should always be dealt with carefully. Surf fishermen can avoid stepping on one by shuffling their feet rather than taking steps. Usually when nudged by a human foot, a sting ray will skitter away. Stepping



on one pins it to the bottom, and the animal will lash its barbed tail in defense. Surf fishermen run the most risk in August and September when female sting rays move into shallow water to bear their young.

A sting ray barb has dozens of curved serrations on its edges and is covered by a sheath containing venom glands. The slightest cut on a human can cause the affected area and lymph nodes to swell. The extreme pain alone can send the victim into shock.

First aid measures include letting the wound bleed for a few moments to flush out some of the poison. The wound should be thoroughly cleaned and put in water as hot as the person can stand for 30 minutes. Research has shown that sting ray venom is very sensitive to heat and breaks down after 15 minutes of soaking. A mild antiseptic should then be applied and the victim should see a doctor.

Source: *Stingrays*. Marine Educational Leaflet No. 2. Gulf Coast Research Laboratory.

CODE OF ANGLING ETHICS

The National Marine Fisheries Service (NMFS) has developed Code of Angling Ethics for recreational fishermen as part of their efforts under President Clinton's 1995 Executive Order regarding the management of recreational fisheries.

Code of Angling Ethics

- ★ Promotes, through education and practice, ethical behavior in the use of aquatic resources.
- ★ Values and respects the aquatic environment and all living things in it.
- ★ Avoids spilling and never dumps any pollutants, such as gasoline and oil, into the aquatic environment.
- ★ Disposes of all trash, including worn lines, leaders, and hooks in appropriate containers, and helps to keep fishing sites litter-free.
- ★ Takes all precautionary measures necessary to prevent the spread of exotic plants and animals, including live baitfish, into non-native habitats.
- ★ Learns and obeys angling and boating regulations, and treats other anglers, boaters, and property owners with courtesy and respect.
- ★ Respects property rights, and never trespasses on private lands or waters.

- ★ Keeps no more fish than needed for consumption, and never wastefully discards fish that are retained.
- ★ Practices conservation by carefully handling and releasing alive all fish that are unwanted or prohibited by regulation, as well as other animals that may become hooked or entangled accidentally.
- ★ Uses tackle and techniques that minimize harm to fish when engaging in "catch and release" angling.

The code was developed with the help of the American Sportfishing Association, the Coastal Conservation Association, the Recreational Fishing Alliance, and Trout Unlimited. NMFS will provide the code to anglers, fishing clubs, bait and tackle shops, and fishing boat operators through a variety of cards, stickers, and posters that promote its use.

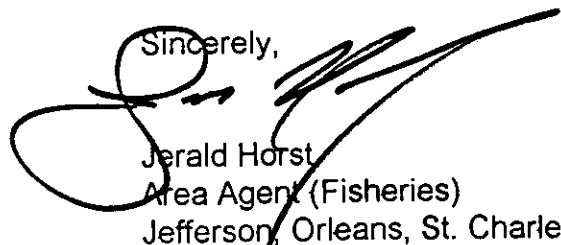
THE GUMBO POT Shrimp Stuffed Squash

This recipe comes to us from Celie Robin of Yscloskey. Celie and her husband Charles have been shrimpers for many years. They know good shrimp and they know good shrimp recipes. Celie's shrimp cooking was featured by the New Orleans Times Picayune Newspaper in 1998.

4 white squash	1 cup cooked shrimp, roughly
1 cup chopped onions	ground in a food processor
1 tablespoon olive oil	1½ cups Italian bread crumbs
1 cup ham, roughly ground in a	2 tablespoons butter
food processor	1 egg

Microwave whole squash on high for 28 minutes, or boil until tender. Cool squash and scoop out pulp, retaining shells for stuffing. In a large skillet, saute onions in olive oil. Add ham and shrimp and squash pulp. Cook for 10 minutes. Add bread crumbs and butter and stir in egg. Sprinkle with additional bread crumbs. Bake in 350-degree oven until brown, about 45 minutes. Serves 4.

Sincerely,



Jerald Horst
Area Agent (Fisheries)
Jefferson, Orleans, St. Charles, St. John