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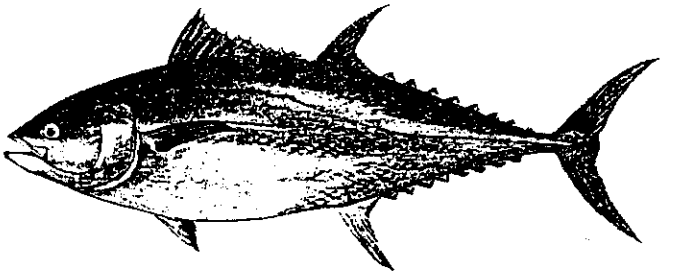
SEA GRANT PROGRAM



LAGNIAPPE

BLUEFIN TUNA

Bluefin tuna are one of the largest predator fishes found in the world's oceans. They can grow to 10½ feet long and weigh 1500 pounds. They are found in both the Atlantic and Pacific Oceans and feed on squid and wide variety of fish.

Bluefin tuna are commercially and recreationally valuable. In 1995, a single bluefin sold for $80,000. In the U. S., the largest number (63%) are caught by recreational fishermen and most of these are small fish averaging about 40 pounds which have not had a chance to spawn.

In the Atlantic Ocean, bluefin tuna, are managed as two stocks, western Atlantic and eastern Atlantic. Eastern Atlantic tuna spawn in the Mediterranean Sea. The western stock spawns in the Gulf of Mexico. Louisiana longline fishermen fishing for yellowfin tuna, swordfish and sharks catch a small number of these very valuable fish under a strict quota.

Because these highly migratory fish don't stay put in any one place, their management is difficult. The management authority for this fish is the International Convention for the Conservation of Tunas (ICCAT). This convention (treaty) was formed in 1966 and 22 countries currently are members.

Unfortunately, even with ICCAT management bluefin tuna stocks have fallen dramatically until the last two years. By 1992, the spawning stock had dropped to only 13% of the minimum healthy level it should be. Only in 1994 was the decline stopped and the stock is now predicted to slowly increase.

While some people have urged a complete shutdown of the fishery because it is so overfished, ICCAT has allowed quotas for harvest. This is because without these quotas, there would be no means to gather the biological data on the fish in order to monitor the stocks.

Bluefin tuna first appear on the spawning grounds in the Gulf of Mexico in January. These are all large fish. Large mature fish and small fish appear off of North Carolina after February. Small bluefin show up off Virginia in late May or early June. Large fish continue their northward migration and appear off of the northern U. S. during July to September and off of Canada even later. How they migrate is influenced by sea surface water temperatures, which change from year to year.

The tuna fishery is managed with guotas, minimum sizes, and by protection of spawners. Quotas are provided for a General Category (commercial rod and reel, handline, harpoon, or bandit gear), Angling Category (rod and reel or handline), Harpoon Category, Charter/Headboat Category, Purse Seine Category, and Incidental Category (longline, purse seine, or fixed gear traps).

The U. S. has supplied 30% of the Japanese market for large (giant) bluefins since 1987. About 90% all giant and medium categories of bluefin tuna caught in the U. S. are exported to Japan, usually to the large Tsukiji Central Wholesale Market in Tokyo.

Prices paid to U. S. exporters are influenced by the Japanese economy, the supply of bluefin in the market at the time, and the quality and size of the individual fish. Price per pound peaks at around a 500-700 pound fish, primarily because of the large amount of money to invest in a single fish (often over $10,000) for export to an unsure market.

Each fish is graded for quality, including fat content, freshness, color, and shape of the fish. Even the condition of the stomach lining, body temperature, and tears or bends in the flesh influence price.

Commercial fishermen in the Gulf of Mexico are only allowed incidental catch which limits them to one bluefin per trip and requires that they have at least 2,500 pounds of other fish on board. This is designed to prevent them from targeting the spawning stock in the Gulf. Recreational fishermen can get an "Incidental Rod and Reel" permit which allows them to harvest one giant category bluefin tuna per year for trophy purposes.

Under the latest stock assessment, quite a few recommendations were made for management changes and limited entry. The only recommendation that would directly affect Louisiana fishermen is for completely eliminating the commercial Gulf of Mexico incidental bluefin fishery. Since 1990, the value of Louisiana commercial bluefin tuna

landings have ranged from a low of $414,496 in 1994 to a high of $2,342,634 in 1991, when it was the fifth most valuable species of finfish landed in Louisiana. No final decisions have been made on any of the recommendations yet.

Source: Historic Rationale, Effectiveness, and Biological Efficiency of Existing Regulations for the U. S. Atlantic Bluefin Tuna Fisheries. A report to the United States Congress. National Marine Fisheries Service. 1996.

FINAL HACCP TRAINING MEETING FOR 1997

By now, most seafood processors have taken the three day HACCP training meeting required by the new federal regulations. According to the regulations , a person trained in HACCP principals by taking the class must keep and/or review all seafood processing plant records.

In order to make sure that everyone who needs the training has it, the LSU Agricultural Center has scheduled another class at Burden Plantation on Essen Lane in Baton Rouge on July 28-29-30.

You must preregister for the class. Send the name and address of person who will attend and a check for $100 per person to Michael W. Moody, LCES, PO Box 25100, Baton Rouge, LA, 70894-5100. **Make the check out to AFDOSS.**

IMPACTS OF FLORIDA BASS STOCKING

Florida bass are a subspecies of largemouth bass, closely related to our native subspecies, the northern largemouth bass. Florida bass seem to have a genetic makeup that allows them to grow larger than our native northern largemouth bass. They are closely enough related to our bass to hybridize with them and pass on some of the superior growth genes to their young.

The possibility of producing larger bass has made the stocking of Florida bass a very popular subject. Louisiana began stocking of Florida bass in 1981, although initially in very low numbers because of the lack of availability of fingerlings.

In order to measure whether stocked Florida bass are surviving and spawning in sufficient numbers to have an impact on the quality of fishing, the Louisiana Department of Wildlife and Fisheries samples bass from water bodies that have received Florida bass stockings. These fish are then analyzed in a laboratory to determine if they are a native northern largemouth bass, a Florida largemouth bass or a hybrid between the two. The results of the last two years of such work are shown in the table on the next page.

Water Body	Year	Number Northern	Number Hybrid	Number Florida	% Hybrid/Florida
Atchafalaya Basin	1995	114	1	1	1.7%
Caernarvon	1995	37	0	0	0.0%
Caddo Lake	1995	44	11	5	26.7%
Caney Creek Reservoir	1995	9	25	16	82.0%
Cross Lake	1995	41	3	0	6.8%
Chicot Lake	1995	29	15	7	43.1%
Chicot Lake	1996	64	18	45	49.6%
Lake D'Arbonne	1995	50	2	3	9.1%
Black Bayou (Bossier)	1995	37	4	3	15.9%
False River	1995	25	8	7	37.5%
False River	1996	16	2	10	42.9%
Lake Concordia	1995	53	9	2	17.2%
Lake Verret	1995	52	2	0	3.7%
Spring Bayou	1995	42	1	2	6.7%
Lake Claiborne	1995	30	0	0	0.0%
Lake Providence	1995	59	5	1	9.2%
Lake Rodemacher	1996	21	15	0	41.7%
I-55 canal @ Ruddock	1996	37	0	3	7.5%
Grand Bayou Reservoir	1996	88	3	11	13.7%

It is immediately obvious that Florida bass stocking has had more of an effect in some water bodies than others. Generally speaking, the water bodies that had the most Florida bass stocked over the most years showed the highest percentage of fish that are pure Florida bass or their hybrids. The Caney Creek Reservoir sample was 82% hybrid or Florida bass. It is also the lake that has received the most Florida bass stockings, with over 2.5 million over a period of years.

In Chicot Lake, 1.1 million Florida bass have been stocked after the lake was poisoned to remove native northern largemouth bass. Still, samples showed that the huge majority of fish were natives, until repeated heavy stocking of Florida bass finally had an impact.

False River is an interesting case all by itself. Samples show a high percentage of hybrid and Florida bass in the population. But the overall fish population (including bass) has shown a significant decline in recent years. No one knows why, but Department of Wildlife and Fisheries biologists are planning an intensive research program for the lake in the near future.

Lake Rodemacher has had less Florida bass stocked than many of the water bodies listed above, but Florida bass have taken hold there very well. According to Gary Tilyou, with the Department of Wildlife and Fisheries, Florida bass do better in some places than others for reasons that are not clearly understood.

Besides the variation from place to place, Tilyou stated that the most important factor in how well these fish become established, is heavy stocking over a period of years. One stocking doesn't seem to do it, but rather a 5 to 8 year program of stocking yields the best results. He further added that in order to see a significant impact, that about 30% of the bass in the lake should either be Florida bass or Florida/northern hybrids.

CRAB LAW ENFORCEMENT

Blue crab management and laws are a topic of strong interest. Some fishermen have complained of declining catches and there are several bills in the legislature focusing on crabs. A comment that fishermen often have is on low enforcement of crab laws. When I looked into it, however, I found that was indeed quite a bit of enforcement. In the month of April alone, enforcement agents made the following cases:

Possession of undersized crabs	10
Setting traps in a navigable channel	1
Tending crab traps during illegal hours	2
Selling undersized crabs	70
Use of crab traps without required markings	2
Failure to mark crab containers	6
Removing the contents of crab traps	6
Theft of crab traps	1

A total of 35,984 pounds of crabs were confiscated or released in April.

COMMERCIAL VESSEL LICENSES

There seems to be some confusion over which commercial fishing licenses are transferable and which aren't. Under current law a license is required for the fisherman, for the gear used, and for any commercial fishing activity below the saltwater/freshwater line a license for the vessel is also required.

Commercial vessel licenses are **not** transferable from vessel to vessel, but gear licenses are. A commercial fisherman fishing in saltwater areas that does not have a

vessel license specifically for the vessel he is using will receive a class 3 citation. This is a serious violation, because conviction may mean loss of some permits.

Commercial vessel licenses cost $15 and may be purchased at either the New Orleans or Baton Rouge offices of the Department of Wildlife and Fisheries.

FISH AND WILDLIFE ARE WORTH BIG BUCKS

A new Department of Wildlife and Fisheries study shows that value of Louisiana fish, wildlife and boating resources are enormous -- 93,486 jobs, over $2 billion in salaries and wages, and more than $260 million in state sales taxes. The table below gives the breakdown.

Economic Impacts of Fisheries, Wildlife and Boating Resources

activity	retail sales (million $)	total economic effect (million $)	jobs (number)	state sales tax and income tax revenues (million $)
Hunting	389.2	758.5	9,800	20.8
Recreational Fishing	790.0	1,600.0	18,400	38.5
Non-Consumptive Fish and Wildlife Recreation	253.3	512.3	6,800	21.0
Recreational Boating	1,500.0	3,000.0	26,600	72.6
Commercial Fishing	2,100.0	2,800.0	31,400	107.0
Alligator Harvest	23.0	40.2	430	1.2
Reptile and Amphibian Collection	1.3	2.5	20	.1
Fur Harvest	1.4	2.5	36	.1
TOTAL	**5,058.2**	**8,716.0**	**93,486**	**261.3**

This study is the first one that puts all of the resources and their industries' values inside one cover and should solve some disagreement over the value of our resources.

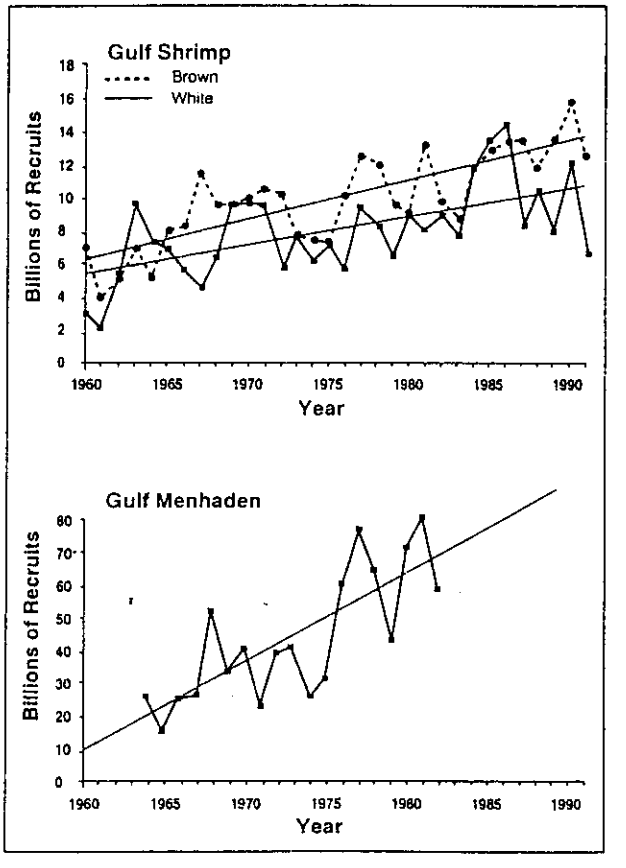
Source: The Economic Benefits of Fisheries, Wildlife and Boating Resources in the state of Louisiana by Rob Southwick, Southwick. Associates. 1997

WETLAND LOSS AND FISHERIES

Probably no other state in the U. S. has an economy and culture that is as linked to coastal fisheries and wildlife as Louisiana. Almost one-third of the nation's commercial fisheries catch is produced by Louisiana. Louisiana also leads the nation in fur production, producing 40% of all wild furs.

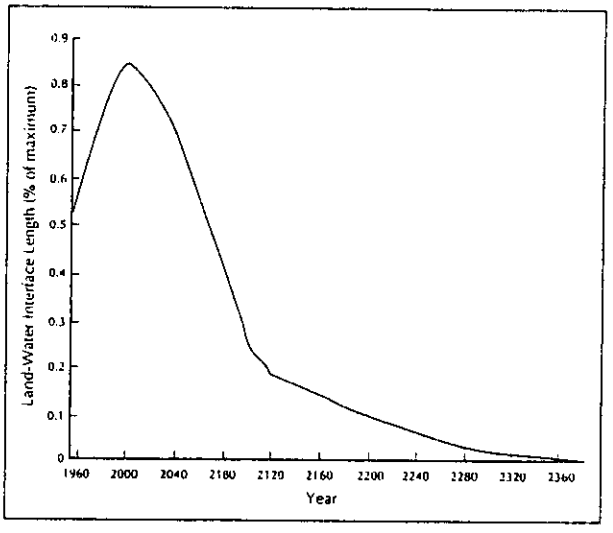
Louisiana's wetlands also overwinter 20% of all of the North American continent's waterfowl, producing excellent hunting. About 3 million days are spent sport fishing and hunting in the state. Approximately 93,500 jobs are produced by commercial and recreational use of fisheries and wildlife resources.

The link between the amount of wetlands and the amount of fisheries resources is well-proven but not totally understood. Shrimp, especially brown shrimp, demonstrate the wetlands-fisheries link well. They actively seek grassy wetlands, probably for protection and the food produced by the plants. It seems that what determines a marsh's productivity is the amount of land-water interface, which is another term for edge or border area. In a solid grassy area of marsh, the only "edge" where grass meets water is on the outside borders of the area. If this area turns into a "broken marsh" with pieces of marsh mixed with ponds, puddles, and sloughs, the amount of "edge" between grass and water increases and so it seems, does the amount of fisheries resources. The figures on the right show how two of Louisiana's common fisheries stocks have increased with time as the marshes have opened up.



The irregular lines show the number of recruits or new additions to the population each year. The straight lines show the general trend. As can be seen, the trend line is up for both brown and white shrimp and menhaden, possibly due to the increase in food and shelter produced by marsh break-up.

Louisiana's coastal fisheries landings have indeed increased significantly while coastal wetland loss has increased. Cause-and-effect proof that one relates to the other is not definite, but most scientists currently believe in the link. This sounds like good news at first glance. Unfortunately, the prediction is that after marsh break-up reaches a certain stage, fisheries production will drop, perhaps very strongly.



The figure above shows the predicted changes in land-water interface. As can be seen the amount of fisheries - productive edge will drop sharply as more and more areas are changed from broken marsh into open water. Most scientists predict a similar curve showing a dramatic future drop in fisheries production after the period of increase.

At the present time, scientists cannot say where we are on the curve, still on the increase, at the peak, or on the decline, and if we are on the decline, how far fisheries production will drop.

Source: Scientific Assessment of Coastal Land Loss, Restoration and Management in Louisiana, by Donald Boesch and others. Journal of Coastal Research. Special Issue No. 20. 1994.

LOUISIANA FINFISH STOCK ASSESSMENTS

Act 1316 of the 1995 Louisiana Legislature requires that the Louisiana Wildlife and Fisheries Commission shall deliver to the legislature year, a peer-reviewed report on the biological condition of mullet, black drum, sheepshead and flounder.

The act further requires that if the spawning potential ratio (SPR) of any of these fish is below 30% that the Department of Wildlife and Fisheries must close the season for that fish for one year. SPR is the ratio of the egg-producing ability of all the mature fish in a fished stock of fish as compared to the egg producing ability that would exist if the stock was unfished. SPRs are often used as targets for managing stocks of fish.

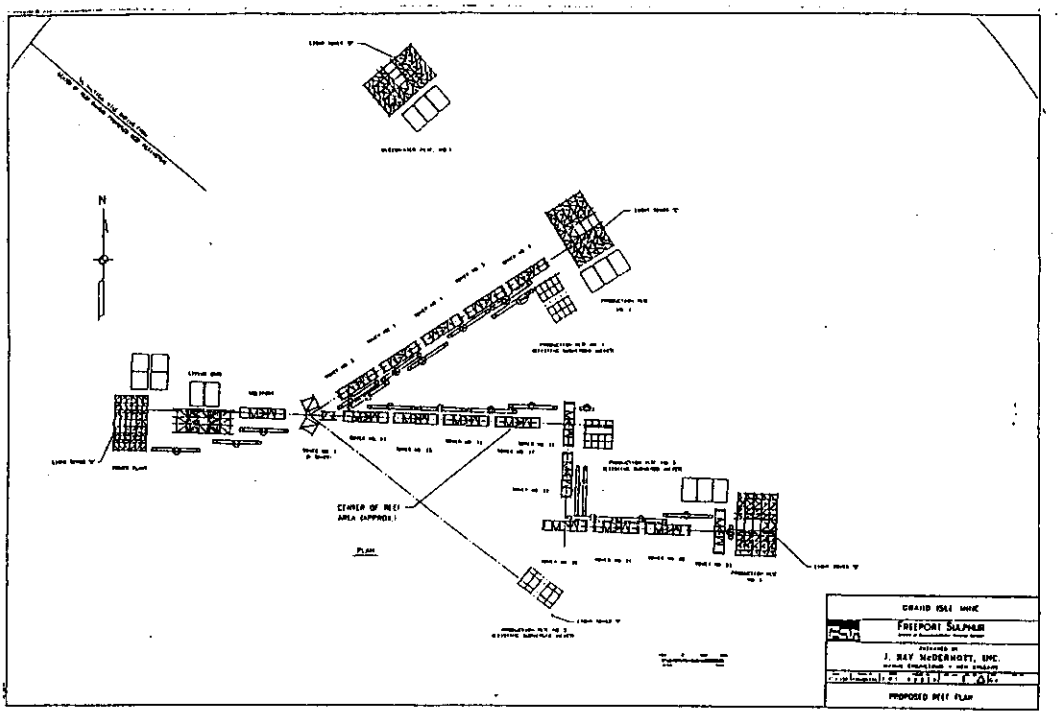
Listed below are this year's stock assessments as compared to last year's.

SPECIES	1996 SPR	1997 SPR
Mullet	43% - 80%	34% - 66%
Black Drum	42% - 67%	42% - 67%
Sheepshead	48% - 75%	42% - 72%
Flounder	17% - 44%	28% - 64%

The biggest change is in flounder. Department of Wildlife and Fisheries biologists have changed some of the methods they use in order to improve the accuracy of their stock assessments on their fish.

WORLD'S LARGEST ARTIFICIAL REEF

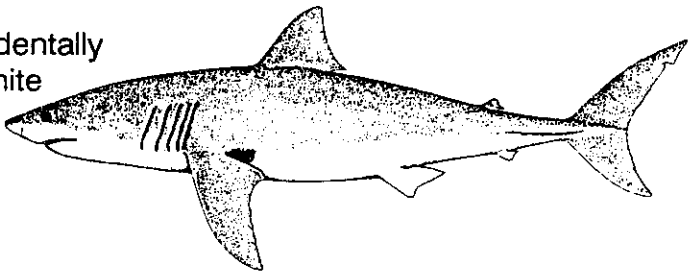
Louisiana will have the world's largest artificial reef 7 miles off of Grand Isle when the huge Grand Isle Sulphur Mine is dropped in place in 50 feet of water. It will also be the reef closest to shore. All other Louisiana artificial reefs are 30 to 100 miles offshore.



The rig's legs will be cut off 30 feet below the surface of the water and peeled downward in an inverted V. The superstructure will be submerged near the legs. The site will be equipped with buoys and lights.

"JAWS" IN THE GULF

The movie "Jaws" and the many television documentaries that followed have sparked public interest in the great white shark, *Carcharodon carcharias*. White sharks are usually thought of as occurring in the colder waters of the Pacific and north Atlantic Oceans. White sharks are considered rare south of Cape Hatteras, North Carolina and in the Gulf of Mexico.



Recently, researchers on Florida's Gulf Coast studied white sharks caught incidentally by commercial bottom longliners. Seven white sharks were examined, all caught between January and April when water temperatures were below 57 degrees. No white sharks were caught in the warmer months even though longlining activity was much higher. This indicates that white sharks only enter Gulf waters when water temperatures are low.

Four of the fish were females with the largest being 13 feet long and weighing 1179 pounds. The largest male was 15 feet, 9 inches long and weighed 2196 pounds. The stomach of the largest male contained another shark estimated to be 8 feet long. The largest female's stomach contained the entire remains of a porpoise 5 feet long.

Marine mammals are thought to be an important part of the diet of the white shark throughout its range. Strandings of marine mammals in the Gulf of Mexico are highest during the same months of white shark occurrence. Research on porpoises in the Gulf show that 22% of them have shark bite scars.

Research data on white sharks off of Louisiana is poor. However, National Marine Fisheries Service observers on Japanese tuna longline boats in the Gulf of Mexico recorded 35 white sharks caught as bycatch between February and April, 1979. According to Michelle Kasprzak, a biologist with the Department of Wildlife and Fisheries, water temperatures monitored 3 miles off of Louisiana fall below 57 F degrees from November to April. Shark attacks of any kind on humans in Louisiana are extremely rare.

The researchers did note that white sharks may indeed be more common thant the catch of 7 indicated. This is because Florida longliners typically use monofilament ganglions on their longlines which easily allow large sharks to bite through them.

Source: Seasonal Occurrence of the White Shark, *Carcharodon carcharias*, in Waters off the Florida West Coast, with Notes on its Life History, by Douglas H. Adams, Michael E. Mitchell, and Glenn R. Parsons. Marine Fisheries Review, 56 (4), 1994.

LOUISIANA MENHADEN BYCATCH RESEARCH

Menhaden, commonly known as pogies in Louisiana, are the state's largest fishery in poundage. In 1995, Louisiana landings of menhaden were 921,120,105 pounds worth $46,138,829, dockside. Record landings of 1,856,504,340 pounds occurred in 1972.

Menhaden are not caught for human consumption. Almost all of them are processed at reducing plants into fish meals, oils, and solubles. The meal is widely used as animal and fish feed. The oil is used in making marine greases and lubricants, rubber, paints, and in some animal feeds. In Europe and South America, the oil is also used for human consumption as cooking oil and margarine. Fish solubles are used as animal feed ingredients. In the Gulf of Mexico region, 5 processing plants are located in Louisiana and one in Mississippi. A smaller fishery for menhaden also exists for use as bait by crab and finfish fishermen.

Menhaden for fished for reduction purposes between April and the end of October each year. Menhaden are the only fishery in Louisiana which are fished for with spotter airplanes and purse seines. Because of the size of the fishery and the type of gear used, questions are often raised about the amount of bycatch in this fishery.

To answer some of the questions, researchers at LSU studied the menhaden fishery off of Louisiana in 1994 and 1995. The researchers made 24 trips on various menhaden vessels in 1994 and 25 trips in 1995. They took samples from the stream of fish going from the net into the fish hold and counted and identified them. They also recorded any bycatch that was released from the net.

The results of their work showed bycatch of species other than menhaden in the purse seines to be low. Based on median values, the bycatch rate in numbers of fish was 0.4% in 1994 and 1.33% in 1995. By weight, bycatch was even less, at 0.16% in 1994 and 0.13% in 1995. This is much lower than one percent (1.0%). Overall, bycatch rates were lower in the western end of the state than the eastern end.

For both years, the most common bycatch species were Atlantic croaker, sand seatrout (white trout), and spot. These three species accounted for over 70% of the total bycatch by number. By weight, five species, Atlantic croaker, sand seatrout, silver seatrout, striped mullet and spot made up 70% of the bycatch in 1994. In 1995, Atlantic croaker, sand seatrout, gafftopsail catfish, spot and cabbage head jellyfish accounted for 78% of the catch by weight. The most common species, Atlantic croaker, only occurred in 30% of the net sets in both years.

In released bycatch, the researchers noted 315 sharks in 1994 and 368 in 1995. In 1994, a total of 116 redfish were observed in the released samples and 245 were observed in 1995. About half of these were released dead and half alive.

Only 2 king mackerel were observed in 1994 and one in 1995. Twenty-six speckled trout were noted in 1994 released samples and 41 in 1995. Four black drum were observed in 1994.

During sampling, two green sea turtles were observed in 1994, and both were released healthy, as were the one hawksbill and two loggerhead sea turtles in 1995. In 1994, one Atlantic bottlenose dolphin was observed, which was released healthy. In 1995, three dolphins were observed, however, only two were released alive and one was released dead.

Source: Bycatch in the U. S. Gulf of Mexico Menhaden Fishery. Results of Onboard Sampling Conducted in the 1994 and 1995 Fishing Seasons. Janaka de Silva and Richard Condrey. Coastal Fisheries Institute. Louisiana State University. 1996.

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THE GUMBO POT
Crawfish Bisque

This month's recipe is adapted from one by Jerry Folse, Chef John Folse's brother. Crawfish bisque is always a lot of work and I would hesitate to include it in here, except that it is so good.

Stuffing the Heads

10	lbs whole crawfish
1	onion
1/2	bunch green onions
1/4	cup parsley
2 1/2	slices of bread
1 1/2	stalks celery
1/4	cup bell pepper
1	tbsp chopped garlic
1/4	cup milk
1	egg
	creole seasoning
	salt
	pepper

Scald crawfish by putting in boiling water. Turn heat off after water returns to a boil. Remove and peel after cooling, saving 75 of the largest heads. Clean everything from the heads and boil the shells 10 minutes. Grind crawfish tail meat, onions, green onions, parsley, bread, celery, bell pepper and garlic in a meat grinder (or chop in a food processor). Season with salt, pepper and creole seasoning to taste. Add egg and half of milk. Mix well, if too dry to stick together, add rest of milk. Stuff the heads with the meat and place on a cookie sheet. Bake for 15 minutes at 350 degrees.

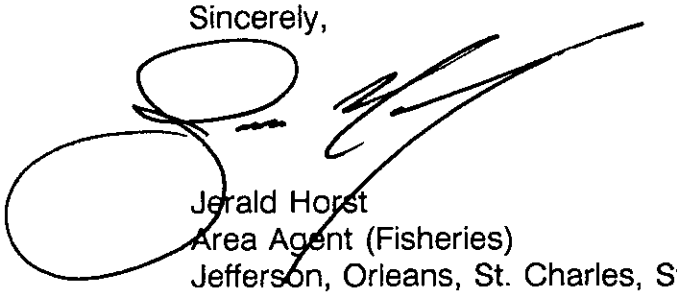
Making the Sauce

1 3/4	cups oil
2	cups flour
2 1/2	cups onions
1	cup green onions
1	cup parsley
3	bay leaves

1/2	cup bell pepper		salt and pepper
1	tbsp chopped garlic	1	lb crawfish tails
1/2	cup celery		stuffed heads
1	8 oz can tomato sauce		rice
	water		

Make a roux in a heavy pot with oil and flour. Stir constantly until reddish-brown. Add onions, bell pepper, and garlic. Saute in roux for 5 to 7 minutes. Add celery, tomato sauce and about 1 quart of water. Simmer for about 10 minutes. Slowly add water until consistency you desire is reached. Add bay leaves and half of green onions and parsley and simmer, covered, for 30 minutes. Add salt and pepper to taste, rest of green onions and parsley and crawfish tail meat. Cover and simmer 10 minutes. Add stuffed heads, heat and serve over rice. Serves 6.

Sincerely,



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Jefferson, Orleans, St. Charles, St. John