Louisiana State University
Agricultural Center
Louisiana Cooperative Extension Service

Jefferson Parish Office
1855 Ames Blvd.
Marrero, LA 70072
(504) 349-5644
Fax: (504) 349-8817

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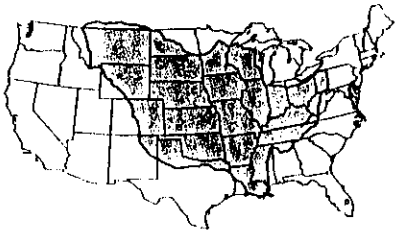
SEA GRANT PROGRAM

Mississippi River Basin



LAGNIAPPE

THE RIVER

The Mississippi River and its distributary, the Atchafalaya River, dominate the geology and biology of Louisiana. The Mississippi River is the seventh largest river in the World and drains 25 states and several Canadian Provinces. It and the Atchafalaya dump about 420 billion gallons of freshwater per day into the Gulf of Mexico.

Its sediments built much of the land of southeast Louisiana; its waters are heavily used for drinking water and industrial purposes, and the nutrients it carries are the foundation for Louisiana's fabulous coastal fisheries.

The quality of these waters has become of increasing interest in recent years. River water and sediments are being used, and considered for more use, in coastal restoration efforts. Nutrients carried by the river are being investigated by some scientists as contributing to the hypoxic area (dead zone) in the gulf. Pollution from a variety of sources is also an ongoing public concern. In order to answer questions about the quality of water in the river, the U. S. Geological Survey conducted a study from 1987-1992. Some of the results of the study are as follows:

Sediments. Sand, silt and clay carried by the river to the gulf are half of what they were when the United States was settled. Most of this decrease has happened since 1950 and is largely due to the construction of dams on the Missouri and Arkansas Rivers.

Around the year 1700, the Missouri contributed 70% of all the sediment carried by the lower Mississippi River. Two-thirds of its sediments are now being trapped behind its dams.

Heavy metals. These are elements such as iron, copper, zinc, uranium, cadmium, lead and mercury. Some are needed in the diets of humans. Others, such as lead, mercury and cadmium, can be poisonous when they occur in high concentrations. Some heavy metals are contributed to the Mississippi River by natural processes such as erosion, but it is estimated that mining adds ten times as many to the water as is natural.

Most heavy metals are not dissolved in the water, but rather they are attached to the sediment particles carried by the river. Generally speaking, the concentrations of lead, cadmium, copper and chromium were highest in upper reaches of the river and decreased in samples taken down the river. The level of mercury in the river is lower than that for lead, however, the chemical form of mercury found in the lower half of the river is the type most easily absorbed by the human body.

Overall, concentrations of heavy metals dissolved in the 1700 miles of the river are well below the legal guidelines for drinking water and water that supports aquatic life. However, heavy metals associated with sediment suspended in the water were higher than pollution guidelines at many of the sample locations. The study concluded that it is difficult to determine if the levels of heavy levels have increased or decreased in recent years.

Nutrients. These are chemical compounds used by plants in their growth. The ones of most interest are those containing nitrogen and phosphorus. An oversupply of these nutrients can cause large increases in algae growth. An overabundance of algae can cause taste and odor problems in drinking water. Also, when these algae die, the bacteria that feed on the dead algae can cause oxygen shortages in the water. Oxygen depletions kill fish and also change the chemistry of the water in ways that make heavy metals move out of the sediments and into the water.

Nutrients can come from many sources, including human and animal wastes, household cleaners and detergents, lawn and crop fertilizers, and industrial wastes. The study estimates that 75% of the nutrients currently carried by the river are from human activities and 25% from natural sources.

Nitrates are the nutrient of most interest. One concern is that nitrates are being added to the Gulf of Mexico by the river in larger amounts than may be good for the ecosystem. Nitrate concentration in many of the smaller rivers that flow into the Mississippi River in Iowa, Minnesota and northern Illinois sometimes are near or over drinking water standards for the U. S. Although nitrate concentrations in the river have increased since the turn of the century and are considered high, they have not changed in the last 10 to 15 years.

Pesticides. It is estimated that two-thirds of all pesticides used for agriculture in

the U. S. are applied in the Mississippi drainage. About 3% of them end up in the water, and Iowa and Illinois are the main sources of them. Pesticides are necessary to get increased yields from agriculture to feed people. Herbicides to control weeds make up 58% of the pesticides used in the U. S.

Modern agricultural pesticides break down relatively quickly and do not accumulate in animals as much as those used years ago. The average annual concentrations of all pesticides measured in the Mississippi River are well below health-based limits and do not violate the Safe Drinking Water Act.

Chemicals. The study focused on four chemicals, PCBs, chlordane, DCPA (chlorthal) and hexachlorobenzene. Although PCBs and chlordane were banned in the U. S. some time ago, they still persist in the environment. Both chlordane and DCPA have been so widely used that where they came from cannot be pinpointed.

These chemicals do not dissolve well in water and are usually associated with sediments or move into the animals in the food chain. The sediments they attach to are not all bottom sediments. Some of them are colloids, which are so small they do not settle out, and therefore can be carried long distances by rivers.

Some PCB and chlordane was found in almost every sediment sample taken. The Ohio River contributes the largest share of these chemicals to the Mississippi River. DCPA was also widely found, with no concentrations in any particular area of the river.

Hexachlorobenzene, in contrast, has more specific sources. Five times as much comes in from the Ohio River than any other source on the upper Mississippi River. In the lower river, significant concentrations of the compound are added to the Mississippi as it flows through the industrial area between St. Francisville, La. and New Orleans.

Because these chemicals can concentrate in living animals, catfish were sampled up and down the river. None of the chemicals were found in high enough concentrations in fish to be of health concern. PCB levels in catfish were highest in the Mississippi River in Wisconsin and in the Ohio River. Chlordane was highest in the Ohio River and in the Mississippi River in Missouri. The highest concentrations of hexachlorabenzene were in fish from the Mississippi River near Luling, Louisiana. DCPA concentrations in fish were found to have gone down slightly from 1976 to 1981.

Overall, the report stated that water quality trends in the Mississippi River are improving. This is mainly due to changes made by chemical manufacturing industries and improved wastewater treatment by cities and industries. The report does caution that it only provides a brief look at the water quality of the river.

Source: Contaminants in the Mississippi River, 1987-92. U. S. Geological Survey, Circular 1133.1995.

SHRIMP COUNT SIZES/MESH SIZES

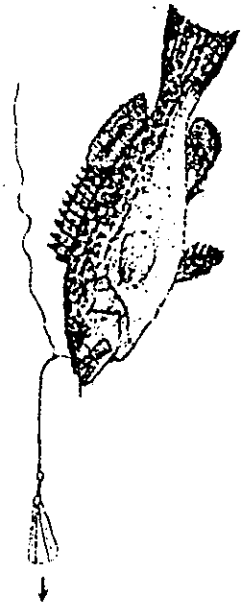
Apparently there is some confusion over count size and mesh size laws on white shrimp. For several years now there has been a minimum count size on white shrimp of 100 to the pound between the opening of the season in September and October 15.

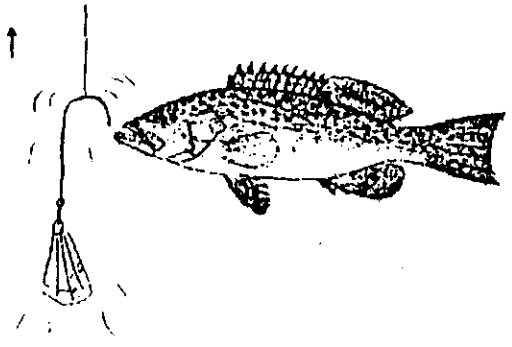
After October 15, there is no minimum count size, but the mesh size for shrimp nets is not reduced from the 1 ½-inch minimum. The 1 ½-inch minimum mesh size is in effect the entire white shrimp season for inside waters. The minimum mesh size for outside waters is 1 ¼-inches to allow the harvest of seabob shrimp.

RELEASING DEEPWATER FISH

Many snapper fishermen have expressed concern about how many of the undersized red snappers they release actually survive. The main problem is the decompression that the fish go under when being reeled in, causing their air bladders to inflate and pop out of their mouths. The only method of helping the fish survive was by puncturing the air bladder with something sharp.

In South Africa, another method is being used that seems to work much better. With this method a barbless stainless steel hook is run through the upper jaw lip from above. The hook eye is attached to a short line with a ½-pound weight. A second line, attached to the bend of the hook, is used to lower the fish to the bottom. Then a sharp jerk on the line pulls the hook and weight free from the fish to be used again.





This method works better than puncturing the air bladder because there is no hole in the fish to get infected and the fish doesn't spend time floating on the surface where a predator can get it.

Source: Alternative Method for Returning Fish to Sea by Jim Bohnsack, in South Atlantic Update. South Atlantic Fishery Management Council. September, 1996.

OYSTERMEN IN DISPUTE OVER MITIGATION

Freshwater diversion from the Mississippi River is viewed by many people as a valuable tool in restoring Louisiana's coastal marshes. One of the unfortunate side effects of freshwater diversion is that fresh water kills oysters, and may make many leased oyster beds that have been built and cultivated for decades useless. Last year, oystermen sued to stop freshwater diversion from the Caernarvon Project because of damages.

This year, the Oyster Coastal Restoration Committee was formed to solve some of these problems. At a recent committee meeting, Louisiana Department of Natural Resources Secretary Jack Caldwell, announced that the new federal budget includes $7.5 million dollars for an oyster lease relocation program in the areas affected by the Davis Pond Diversion Project. This massive project will send river waters into Lake Cataouache and through Barataria Bay.

In exchange, Louisiana is committed to divert some water east of the river through Lake Borgne into Mississippi Sound. The Mississippi congressional delegation strongly favors freshwater diversion. The previous freshwater diversion project for the area, through the Bonne Carre Spillway, was strongly opposed by a coalition including the Lake Ponchartrain Basin Foundation and commercial fishermen.

Oystermen are upset by the proposal which would provide only for relocation of leases into new areas and not for other options such as compensation, purchase or exchange, and for retraining of displaced fishermen.

BOAT DRIVERS LICENSE

In October, the Smith Mountain Lake Association in Virginia made an official recommendation to the state that they require a state boaters' drivers license for boat operators. They made this recommendation because of high numbers of boating accidents.

In 1994, the state of Alabama was the first state in the U. S. to require such a license. This license will be required of anyone over the age of 12 years old who operates a motorized vessel.

Alabama created the license with a 5 year grace period so it will go into effect in 1999. Boater certification examinations will be conducted at state drivers license offices

and applicants who pass the test will get an endorsement on their automobile drivers license. People who were 40 years of age or older as of April 28, 1994 are exempted from the test.

A one-time application fee of $5.00 is being charged. People without drivers licenses and children between 12 and 16 may still get certified if they pass the test, but their fee is $20.00

Source: Richmond Times-Dispatch, October 11, 1996.

STATE HANG FUND CHANGE

On September 20, 1995, the state's Fishermen's Gear Compensation Fund (Hang Fund) made a rule change of importance to some fishermen. With this change, a spouse's (wife or husband) income will be included in the requirement that the fisherman prove that at least 50% of his earned income comes from commercial fishing.

Before this change, all the way back to 1979 when the fund was created, only the fisherman's income was considered. According to Michael Warr, an internal auditor with the Department of Natural Resources, in Louisiana, a common property state, part of a spouse's income is considered personal income.

In the future, after the spouse's income is added to the fishermen's income and less that 50% of the combined earned income is from commercial fishing, the fisherman will not be eligible to make a claim for nets or vessels damaged by underwater obstructions.

ALLIGATORS

Louisiana is the major producer of wild and farm-raised alligators in the United States. Besides the use of the hides for leather products, the meat has become a popular "seafood" item. While it is too early for the results of the 1996 season to be in, I have some interesting figures for the previous seasons.

In 1995, 27,120 wild alligators were harvested. The most commonly harvested sizes were 7-footers (32% of the catch) followed by 6-footers (31%). Only about 110 gators were 12 feet long or longer. The 1994 harvest was 28,433 gators and the size breakdown was almost identical.

Over the years, the average size of wild alligators harvested has increased. The percentage of 4 and 5 footers had decreased and the percentage of 6 to 8 footers has increased. Nines and above have remained about the same.

Prices received for wild and farm-raised gators were the same through 1986, although the number of farm raised alligators in those years was very small, never going over 6000 skins sold annually. Farm-raised skin prices peaked in 1988 at $36 per foot.

Prices for wild skins reached their highest point in 1990 at $57 per foot. Last year, farm-raised skins brought an average of $20 per foot and wild skins averaged $41.

Farm-raised alligator production really began to grow in 1986 with skin production doubling each year through 1989. The number of farming licenses peaked in 1991 at 134 with 91 of the farms selling skins. Maximum farm-raised skin production was 136,000 in 1994. Between 2 to 5 million pounds of farm-raised and wild alligator meat has also been sold each year since 1987.

FISH CATCHES

Recently the Gulf of Mexico Fishery Management Council released the landings for cobia, dolphin, king and spanish mackerel. The 12 month fishing year for mackerels starts in the middle of the year so each year shows two numbers. Landings shown below are in thousands of pounds.

YEAR	KING MACKEREL				SPANISH MACKEREL		
	COM.	REC.	TOTAL		COM.	REC.	TOTAL
1984/85	3,205	3,109	6,314		3,445	1,178	4,623
1985/86	3,550	1,832	5,382		3,298	1,355	4,653
1986/87	1,473	3,269	4,742		2,053	7,520	9,573
1987/88	868	2,145	3,013		2,581	3,124	5,705
1988/89	1,405	5,276	6,681		3,902	2,177	6,079
1989/90	1,954	3,360	5,314		2,145	1,856	4,001
1990/91	1,816	3,951	5,767		2,074	2,138	4,212
1991/92	2,117	4,773	6,890		4,163	2,889	7,052
1992/93	3,599	6,258	9,857		3,113	3,130	6,243
1993/94	2,572	6,146	8,718		2,614	2,696	5,310
1994/95	2,942	10,806	13,748		2,544	1,556	4,100

The commercial share of the harvest for king mackerel dropped from 57% of the harvest in 1984 - 1986, to 33% of the total harvest in 1993 - 1995. The commercial quota since 1992/93 has been 2,500,000 pounds annually gulfwide. During that period their harvest has averaged 3,037,000 pounds yearly. The recreational quota is 5,300,000 pounds per year. Their harvest during this same period has been 7,736,600 pounds. Both have overfished their biological quota, the commercials by 537,000 pounds, and the recreationals by 2,436,600 pounds.

Spanish mackerel quotas for recreational and commercial fishermen have not been met since the current quotas were put in place for the 1991/92 season. The Gulf Council has voted this year to reduce the total allowable catch on spanish mackerel from 8.6 million pounds to 7 million pounds. If approved, the annual commercial quota would drop

to 3.99 million pounds and the recreational quota would drop to 3.01 million pounds gulfwide. The commercial quota has been 4.9 million pounds and the recreational quota 3.7 million pounds.

	COBIA				DOLPHIN		
YEAR	COM.	REC.	TOTAL		COM.	REC.	TOTAL
1984	174	1,067	1,241		331	1,308	1,639
1985	161	1,116	1,277		327	1,558	1,885
1986	177	1,373	1,550		679	3,120	3,799
1987	202	920	1,122		634	2,798	3,432
1988	180	1,349	1,529		723	2,437	3,160
1989	232	940	1,172		1,685	3,123	4,808
1990	174	812	986		1,849	5,161	7,010
1991	176	1,218	1,394		1,702	5,574	7,276
1992	233	951	1,184		772	4,080	4,852
1993	261	1,034	1,295		609	3,598	4,207
1994	263	1,393	1,656		688	2,742	3,430
1995	152	1,050	1,202		1,165	N/A	N/A

Neither cobia nor dolphin are managed with the use of quotas. The recreational share of the cobia catch has remained relatively stable ranging from 80 to 89 percent of the total landings. The recreational share of the dolphin catch has also been relatively stable at 80-85% of the total catch except during the 1989 - 1991 period when it fell to 73% of the total.

EXOTIC FISH

Exotic fish, animals, and plants are those that are not native to an area but rather introduced purposefully or accidentally. Most often, exotic animals are not good additions to ecosystems, often crowding out native species or causing undesirable environmental changes.

Local examples of exotic plants and animals are water hyacinths (lillies), hydrilla watergrass, tallow trees, nutria, german carp and zebra mussels. Exotic fish introduced to other areas include walking catfish in Florida and ruffe and round gobies in the Great Lakes. The last two fish out-compete desirable native fish for food and space.

One example of a native fish that has had a positive impact with fishermen is the oscar, a very common aquarium fish of the cichlid family. Oscars are native to South American rivers and no one knows how they got into U.S. waters. They were first found in south Florida waters, in the 1950's.

By the late 1980's and early 1990's, they became the number one fish species harvested there recreationally, beating out bass, crappie(sac-au-lait), and bream in the area. In fact more people fished for oscars than for crappie and bream combined, and they became almost as popular as bass in the water conservation areas south of Lake Okeechobee. Oscars taken there average 10 inches long and 14 ounces although some are as large as 1 3/4 pounds. They taste good and are easy to catch on artifical lures, crickets, minnows, shrimp, worms or cutbait. Preliminary population research has not shown any effects by oscars on the native fish population.

It is not likely that oscars would survive in Louisiana, even if they get loose here, since they die at temperatuares below 41 degrees. I have however seen some very large Texas blue cichlids (another aquarium fish) come out of Jefferson Parish drainage canals.

Anyone, who catches an unusual fish should freeze it and report it to the Department of Wildlife and Fisheries Inland Fish Division at (504) 765-2330.

Source: The Contribution of an Exotic Fish, the Oscar to the Sportfishery of the Everglades Water Conservation Areas. Jon R. Fury and Frank A. Morella, Florida Game and Fresh Water Fish Commission. 1994.

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THE GUMBO POT

Grilled Soft-Shell Crabs

While frying is the most common method of cooking soft-shell crabs, there are other methods. Here's one. I used peeler crabs that didn't make it out of the shell on their own. They didn't have legs, which worked out fine on the grill. I enjoyed this recipe very much.

6 softshell crabs
1/2 cup salad oil
1 tbsp white vinegar
1/4 tsp tarragon
1/2 tsp salt
1/2 tsp lemon pepper seasoning
1/2 tsp lemon juice
1/8 tsp garlic powder

Mix all ingredients except crabs together and let sit at room temperature for several hours to let flavors blend. Clean the crabs. One hour before cooking, place the crabs in a shallow dish and pour marinade over them. Grill over a slow fire at least 12 inches from the coals for no more than 10 minutes on each side. Baste each side with remaining marinade once. Serves 3.

Sincerely,

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