Cooperative Extension Service
500 Main Street, Room 314
Franklin, LA 70538
(337) 828-4100, Ext. 300
Fax: (337) 828-0616
gthomas@agctr.lsu.edu
Web site: www.lsuagcenter.com

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THE END OF SEAFOOD?

The combination of finite ocean resources and an ever-increasing human population suggest a pending dilemma regarding supply and demand of seafood. And some researchers believe that the end may be closer than we all realize. According to a paper published in the journal Science, a group of 14 researchers from Canada, Panama, Sweden, Britain and the United States concluded that overfishing, pollution and other environmental factors will wipe out the seafood supply by 2048.

The group's conclusions are based on the most recent commercial fish catch data (2003) showing that 29 percent of all fished species had collapsed; an increase from 13.5 percent in 1980. They insist that wiping out these important species hampers the ocean's ability to produce seafood, filter nutrients and resist the spread of disease.

A problem of this magnitude would have huge implications on the global economy, not to mention personal implications for those who eat seafood. More than one billion people rely on seafood as their main source of animal protein, while countless others enjoy the health benefits of the omega-3 fatty acids found in seafood.

However, a number of well-regarded researchers and regulators have responded to the "end-of-seafood" hypothesis with strong disagreement. Dr. Ray Hilborn spoke for many in a recent lecture when he pointed out that extrapolating a "rate-of-failure" for certain fisheries into a world-wide scenario was bad science that completely ignores the active and successful management of many stocks.

Furthermore, the National Fisheries Institute (NFI) issued a statement saying, according to the National Oceanic and Atmospheric Administration (NOAA) and the United Nations Food and Agriculture Organization (FAO), more than 75 percent of global fish stocks are sustainable and will provide seafood now and for future generations. They cite legislation and regulations in developed countries such as Australia, Britain and the United States that help manage stocks and rebuild over-exploited fisheries. FAO scientists also note that for the past quarter-century, wild fisheries have provided between 85 and 100 million metric tons of seafood annually, with aquaculture filling the demand gap.

Additionally, the group's prognosis was not completely hopeless. In nearly 50 regions where restrictions were imposed to stop overfishing, on average, the range of species in the water increased by 23 percent within five years. This suggests that sound management can halt the decline of fish stocks worldwide.

Unquestionably, there is room for improvement in fisheries management. A recent article in Fisheries Research warns that the concept of sustainability is a vague term that should be used with caution, since the entire history of fishing has been one of depletion and moving on. As such, predictable and sustainable catches at levels approaching those that we enjoyed in mid-20th century are simply not attainable by conventional fish stock modeling. Another study in the journal Nature indicated that fishing tends to amplify both the peaks and the valleys of population numbers. The researchers believed that the reason fished populations become more variable is because fishing selectively culls larger, older individuals, thereby removing the fish that are better able to buffer random environmental variation. These are the individuals that would make disproportionately important contributions to production of viable eggs and larvae in unfished populations.

These and other new scientific findings demonstrate the importance for evolving management practices. Continued high rates of seafood harvest will require sensitive management practices that focus on the fish and all of the players – consumers, regulators, politicians, economists, scientists, fishermen at sea and fleet managers ashore.

Sources: Longhurst, Alan. *The sustainability myth*. Fisheries Research. 81 (2006) 107-112.

For more information on the Science-related news releases, visit www.intrafish.com. For more information on the Nature summaries see www.nsf.gov. Ray Hilborn's discussion can be viewed at http://www.researchchannel.org/prog/displayevent.asp?rid=3519

USING INVASIVE ASIAN CARP FOR BAIT

Thirty years ago, the only carp in Louisiana was the so-called German carp (*Cyprinus carpio*), which has been here so long that many people think it's a native fish. In fact, it came originally from western Asia and had been moved all over Europe and then to the U.S. It's now considered a pest and has few uses.

In the 1970s, freshwater fishermen in Louisiana began seeing grass carp (*Ctenopharyngodon idella*), which became fairly common in the big rivers. And in the 1980s, several additional species started showing up. We now have sizeable populations of German, grass, bighead (*Hypophthalmichthys nobilis*) and silver carp (*Hypophthalmichthys molotrix*) and several black carp (*Mylopharyngodon piceus*) have also been caught.

All of these species are native to Asia, with the last four being brought to the U.S. for use in pond fish culture. When a few escaped into waters in the Mississippi valley, it was only a matter of time until they spread to nearly every water body in that system. They are becoming more and more common in the Mississippi and Atchafalaya rivers, as well as in most areas that are reached by the floodwaters of those rivers.

All Asian carp can get large, with individual fish well over 50 pounds in weight. They are undoubtedly displacing our native species of fish to some degree, though no one can predict what the final impacts will be to our aquatic ecosystems. They are a definite problem for commercial fishermen, who find their nets damaged and then often have no buyers for what they land. Boaters have been injured by silver and bighead carp, which have the habit of jumping high out of the water when a boat passes.

So far, few markets are taking these fish, although they are very popular food fish in Asia. All are bony, with the same type of intramuscular bones that are found in buffalo fish. One use for these fish is crab and crawfish bait, which is in short supply in Louisiana during parts of the year. However, the time and expense of cutting large fish into pieces of the desired sizes has been a problem.

LSU Biological and Agricultural Engineering professor Lynn Hannaman has developed a machine that cuts large fish into bait-sized pieces in a single pass. A number of such machines have been developed in the past, but fishermen were often unhappy with the product. The new equipment makes clean, even cuts with little waste. Hopefully, this will result in a win-win-win situation: Hoop net fishermen will be able to sell these fish, and crabbers and crawfish fishermen and farmers will have a steady supply of locally caught bait, and the rivers will have fewer invasive species.

NEW SEASONAL CLOSURE FOR SOME RECREATIONAL GROUPER FISHING

NOAA Fisheries Service published a final rule implementing a recreational closed season for black, gag and red grouper on Nov. 17, 2006. The seasonal closure will be in effect from February 15 to March 15 beginning in 2007 and will occur annually.

NOAA Fisheries Service proposed this closure on March 31, 2006. The seasonal closure includes important spawning seasons for black, gag and red grouper and will coincide with the one-month commercial fishery grouper closure already in effect. Prohibiting harvest of all three species will reduce bycatch and prevent effort from shifting to spawning aggregations of gag and black grouper as a result of more restrictive recreational red grouper regulations.

NOAA Fisheries Service delayed implementation of the seasonal closure in response to concerns from the public and because a pertinent new gag grouper stock assessment was pending. The latest stock assessment for gag, completed in August 2006, indicates gag is undergoing overfishing. In light of this new information and considering the benefits of the seasonal closure discussed previously, NOAA Fisheries Service is now implementing the recreational closed season for red, gag and black grouper.

The seasonal closure, in combination with grouper bag limit provisions implemented earlier this year, are estimated to reduce red grouper landings to levels specified in the red grouper rebuilding plan implemented on July 15, 2004. These bag limit provisions included: 1) Reducing the bag limit from two to one red grouper per person per day; and 2) prohibiting for-hire captain and crew from retaining bag limits of grouper while under charter.

For a complete description of the regulatory changes, visit the Federal Register Web site at http://www.gpoaccessgov /fr/index.html.

WINTER RED SNAPPER COMMERCIAL FISHERY TO OPEN

NOAA Fisheries Service announced that the commercial fishery for red snapper in the Gulf of Mexico federal waters will open at noon, local time, on Dec. 1, 2006, and will close at noon, local time, on Dec. 26, 2006, when the commercial quota is projected to be met.

The 2006 Gulf of Mexico commercial red snapper quota is 4.65 million pounds (MP). The commercial fishing season is divided into spring and fall seasons. The spring season began at noon, local time, on February 1, with 3.10 MP available, and the fall season begins at noon, local time, on October 1, with the remainder of the annual quota available. During the spring and fall seasons, fishing will be allowed during the first 10 days of each month, landings data compiled, and the fishery will be shut down for the year when the quota is reached. This method prevents “over-runs” in the quota that often occurred when landings data lagged several months behind actual fishing effort.

Preliminary landings data for Feb. 1-10, 2006 (415,728 pounds), March 1-10, 2006 (427,361), April 1-10, 2006 (423,647), May 1-10, 2006 (332,670), June 1-10, 2006 (249,964), July 1-10, 2006 (289,898), August 1-10, 2006 (332,314), Sept. 1-10, 2006 (362,701), Oct. 1-10, 2006 (387,669), and Nov. 1-10, 2006 (353,096) totaled 3,575,048 pounds of red snapper landed. Therefore, 1,074,952 pounds remain in the quota.

The operator of a vessel with a valid reef fish permit and a Class 1 or Class 2 red snapper license having red snapper aboard must have landed and sold such red snapper before noon, local time, on Dec. 26, 2006. The minimum size for the commercial fishery is 15 inches total length.

THE SHOCKING TRUTH ABOUT STARGAZERS

The stargazers are marine fishes of the western Atlantic and Gulf of Mexico, including the Louisiana coast, that have a habit of burying in sand and can deliver up to 50 volts of electricity. The mildly-shocking Southern Stargazer (*Astroscopus y-graecum*) is the species most likely seen here. Utilizing incurrent nostrils which are directly connected to the mouth, they can breathe while buried, thus exposing only their dorsally-located eyes and a fleshy filament, extending upward from the floor of the mouth, used to lure prey. The electric organs of stargazers are highly modified extrinsic eye muscles, and are thought to use this electricity to stun prey.

Although most electric fishes generate only mild electric fields for communication and sensory purposes, others can generate currents strong enough to stun prey or ward off predators. For example, the electric organs of the electric Torpedo ray have about 45 columns of electrocytes (700 per column) and are capable of delivering a shock of 220 volts.

The ancient Romans used electric fish to cure headaches. The Emperor Claudius’ physician advocated their use: “to immediately remove, and permanently cure a headache, however long-lasting and intolerable, a live black torpedo (ray) is put on the place which is in pain, until the pain ceases and the part grows numb.”

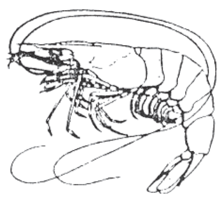
Luckily modern medicine has eliminated the need for live fish to cure migraines; however, the mechanics of electricity production in fish is still of interest to researchers. That is, electric organs are an example of how electric properties of cell membranes can be put to a new use. The current-generating cells of electric organs are referred to as electrocytes; when stimulated an ion flux across the cell membrane creates a small electric current. The electrocytes are typically stacked in columns and discharge simultaneously, producing an additive effect similar to many small batteries connected in series.

Sources: Bond, C.E. 1996. *Biology of Fishes: Second edition*. Saunders College Publishing. p. 219, 312-315.
Helfman, G.S., B.B. Collette, and D.E. Facey. 1997. *The Diversity of Fishes*. Blackwell Science. p. 76, 261.
Schaffer, A. November 7, 2006. *It may come as a shock: can electricity block migranes?* The New York Times: Science Times. p. D1.

HYPOXIA & SHRIMP

Coastal hypoxia in the northern Gulf of Mexico has been in the public eye since Nancy Rabalais and other researchers at Louisiana Universities Marine Consortium (LUMCON) brought attention to it more than 20 years ago. Hypoxia is defined as a condition where 2 parts per million (ppm) or less of oxygen exists in water. At 2 ppm, some marine species become stressed. Well-oxygenated water is 5-7 ppm and it is difficult, even in cold winter waters, to get more than 10 ppm dissolved oxygen in water.

Hypoxic waters are usually found in a layer of varying thickness near the bottom. Bottom-living animals, like shrimp, are likely to be most at risk of being oxygen-stressed.



The sensitivity of shrimp to low-oxygen situations and their reaction to it have been of interest to researchers. In a study to learn more on the subject, a biologist put brown and white shrimp in a 3-inch diameter clear plastic tube, 36 inches long. The tube was set up so that water of different oxygen levels could be introduced into either end. The drain was in the middle of the tube, so that if low-oxygen water was introduced into one end of the tube, the shrimp could move past the drain to the other end of the tube, which was unaffected by the introduced water. The researcher watched the behavior of the shrimp from behind curtains so that his movements wouldn't affect the behavior of the shrimp.

The shrimp used in the test were captured from Galveston Bay, Texas, and transported to the lab in aerated ice chests. At the lab, they were allowed to acclimate for at least 2 days before they were used in the test. Seventy-five white shrimp were individually tested at dissolved oxygen (D.O.) concentrations of 1.0, 1.5 and 2.0 ppm. Seventy-five brown shrimp were tested at 1.2, 2.0 and 3.0 ppm.

Each shrimp was put in the tube in well-oxygenated water and held for 2 hours before lower DO water was introduced. The low DO water was introduced in the end of the pipe that the shrimp was in and the shrimp's reaction to it was recorded.

White shrimp showed strong movement away from 1.0 ppm and 1.5 ppm water, but not from 2.0 ppm water. Brown shrimp showed very strong movement away from water with DO levels of 1.5 ppm and 2.0 ppm, but movement was not significant from 3.0 ppm.

Brown shrimp seemed to be more sensitive than white shrimp to low oxygen levels and moved more quickly to avoid it. Brown shrimp moved differently than white shrimp. Brown shrimp retreated by walking or swimming with the hair-like swimmerettes under their tails.

White shrimp tried moving out of the hypoxia water by flipping their tail 78 percent of the time. This caused a problem when the flipping moved them into the wrong end of the tube. When this happened they continued to try to move by flexing their tail, became exhausted and died within 15 minutes. This was aggravated by the fact that white shrimp seemed to tolerate low (DO) water better than brown shrimp at first, and delayed starting their movement away from it. Both species showed rapid eyestalk movements and flexing of their antennae when hypoxic water was introduced.

Hypoxia is most common and the hypoxic zone is largest at the time of the year when young brown and white shrimp move offshore, as well as when white shrimp spawn and their postlarvae move into the estuaries. Shrimp seem to be able to move away from small hypoxic areas. Such movement or a delay in offshore migration may concentrate shrimp in certain areas, causing more competition for food and higher losses to predators, especially if the shrimp are already stressed by being exposed to low oxygen levels.

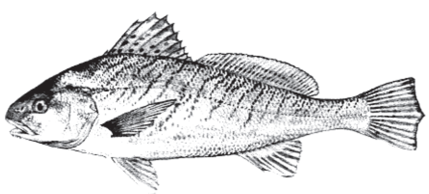
Source: *Detecting and Avoiding Oxygen Deficient Sea Water by Brown Shrimp, Penaeus setiferus (Linnaeus).* Maurice L. Renaud. Journal of Experimental Marine Biology & Ecology, Vol. 98. pp 283-292. 1986.

SPOT & CROAKER

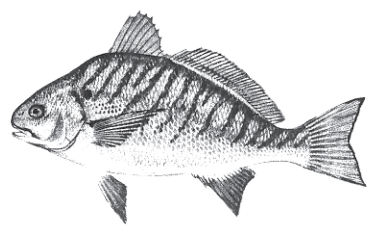
The term “bottomfish” is a loose one. In the Gulf of Mexico, it is usually applied to a group of a couple of hundred species, not including reef fishes. As the name indicates, these fish live on or near sea bottoms made up of mud, sand or crushed shell. Some of these species are important recreational and commercial fishes. In the not too distant past, a large trawl fishery existed in the northern Gulf for these species for use in making pet food.

Off the Mississippi River Delta, seven species out of the 200 make up 75 percent of the mass of groundfish. In descending order of importance, the seven species are Atlantic croaker, spot, longspine porgy, hardhead catfish, sand seatrout, silver seatrout and Atlantic cutlassfish.

The two most common species, Atlantic croaker, *Micropogon undulates*, and spot, *Leiostomus xanthurus*, are both members of the drum family, Scienidae. These two species, to some degree, resemble each other. However, there are major differences. Croakers are a favorite live bait among speckled trout anglers. Both croakers and spot are caught in trawls for use as bait. A careless angler that hooks a spot on as bait rapidly finds out one major difference between spot and croaker. Speckled trout prefer to eat croaker!



Atlantic Croaker



Spot

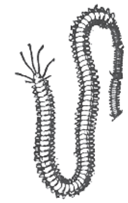
Both species have a basically silver body color, with some brassy or yellowish reflections. Spot have a more hump-backed body shape and a blackish spot the size of their eye behind the upper part of each gill cover. The easiest diagnostic feature is that spot have forked tails and croakers have a convex tail shape, with the longest rays in the middle of the tail.

Scientists studying bottomfish samples taken with trawls in the Gulf have found out a great deal about the two species. They looked at 1,078 spot, ranging in size from 2.5 to 5.9 inches long and 1,396 croakers, 3.2-12.8 inches long.

In croakers, females outnumbered males. They found fish becoming mature as small as 4.4 inches. Spawning took place in October and November with lesser spawning occurring later. Maturing and ripe fish were found at depths of 30-240 feet. The number of eggs produced ranged from 27,300 for a 5.3-inch, 1.8-ounce fish to 1,075,600 for a 12.7-inch, 11.1-ounce fish.

Mature male spot 4.9 inches long and mature females 5.1 inches long were found. Spawning fish were found only in October and November, although other research indicates that some late winter spawning occurs. Mature fish were found in all depths from 30 to 300 feet deep. Egg production ranged from 20,900 for a 5.4-inch, 2.8 ounce female, to 514,400 for 7.1-inch, 6.1-ounce fish.

The most important food item for croakers under 5 inches long was polychaete (segmented) worms (at right), followed by smaller amounts of shrimp and crabs. From 5-8 inches, croakers still ate some polychaete worms, but ate more shrimp and crabs. The shrimp eaten were mostly small pelagic and roughneck shrimp. Substantial amounts of finfish were also eaten by 5-8 inch croakers. Croakers larger than 8 inches ate very few worms, concentrating on shrimp, crabs, mantis shrimp (king shrimp or sea lice) and finfish. Tiny cod-like fish called codlets made up half the finfish in croaker diets.



A total of 760 spot stomachs from fish 2.5-7.9 inches long were checked for food. All sizes of spot depended very heavily on polychaete worms for food. Also eaten, were very small crustaceans, especially burrowing lollipop shrimp. Substantial amounts of sand were also found in their stomachs. One of the spot's nicknames is "sand digger" perhaps derived from its dietary habits.

Sources: *Reproduction and Food Habits of Seven Species of Northern Gulf of Mexico Fishes*. Peter F. Sheridan, David L. Trimm and Bruce M. Baker. Contributions in Marine Science. Vol. 27: 175-204. 1984.

UNDERWATER OBSTRUCTIONS

In accordance with the provisions of R.S. 56:700.1 et. seq., notice is given that 8 claims in the amount of $30,354.81 were received for payment during the period October 1, 2006 - October 30, 2006.

There were 7 claims paid and 1 claim denied.

Loran Coordinates of reported underwater obstructions are:

28552	46878	JEFFERSON

Latitude/Longitude Coordinates of reported underwater obstructions are:

29 06.640	90 57.990	TERREBONNE
29 13.250	89 59.670	TERREBONNE
29 16.080	90 03.230	JEFFERSON
29 25.097	89 59.484	JEFFERSON
29 30.286	89 27.806	ST BERNARD
29 30.581	89 28.892	JEFFERSON
29 38.410	89 22.281	ST BERNARD

A list of claimants and amounts paid can be obtained from Verlie Wims, Administrator, Fishermen's Gear Compensation Fund, P.O. Box 44277, Baton Rouge, LA 70804 or you can call (225)342-0122.

THE GUMBO POT
Crawfish Etouffee

Jo Paula Lantier

Ingredients
1 lb crawfish tails
1 onion, chopped
1 stalk celery, chopped
1 can Golden Mushroom soup
1 bell pepper chopped
1 stick butter
creole seasoning

Directions
Saute in butter, onion, bell pepper and celery until soft. Stir in Golden Mushroom soup. Season crawfish tails with creole seasoning. Stir in crawfish tails and cook for 15 - 20 minutes.

Serves 4

For more information, contact your local extension agent:

David Bourgeois – Area Agent (Fisheries)
Lafourche & Terrebonne Parishes
Phone: (985) 873-6495
E-mail: dbourgeois@agctr.lsu.edu

Albert 'Rusty' Gaudé – Associate Area Agent (Fisheries)
Statewide
Phone: (504) 682-0081 ext. 1242
E-mail: agaudet@agctr.lsu.edu

Thomas Hymel – Watershed Educator
Iberia, St. Martin, Lafayette, Vermilion,
St. Landry, & Avoyelles Parishes
Phone: (337) 276-5527
E-mail: thymel@agctr.lsu.edu

Kevin Savoie – Area Agent (Southwest Region)
Natural Resources-Fisheries
Phone: (337) 475-8812
E-mail: ksavoie@agctr.lsu.edu

Mark Schexnayder – Coastal Advisor (Fisheries)
St. John, St. Charles, Jefferson & parts of Orleans Parishes
Phone: (504) 838-1170
E-mail: mschexnayder@agctr.lsu.edu

Mark Shirley – Area Agent (Aquaculture & Coastal Resources)
Jefferson Davis, Vermilion, Acadia, St. Landry, Evangeline,
Cameron, Calcasieu, Lafayette, Beauregard, & Allen Parishes
Phone: (337) 898-4335
E-mail: mshirley@agctr.lsu.edu

Glenn Thomas – Associate Area Agent (Fisheries)
St. Martin, St. Mary, Iberia, Iberville & Assumption Parishes
Phone: (337) 828-4100, ext. 300
E-mail: gthomas@agctr.lsu.edu