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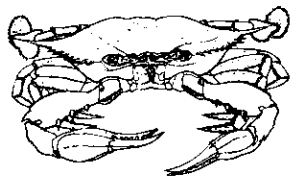
April 1, 2005 Volume 29, No. 4

ARTIFICIAL CRAB BAIT TEST

Blue crabs provide one of the most valuable commercial fisheries in the southeastern United States. Recreational fishermen also take large numbers of crabs. Almost all of the fisheries use some sort of bait to attract crabs. Millions of pounds of finfish are used as bait annually. For a variety of reasons, the availability of baitfish has become a problem in some parts of the U.S. Blue crab bait prices more than tripled in the early 1990s.



In the late 1990s, scientists in North Carolina studied the possibility of using processed poultry (chicken and turkey) carcasses as bait. The central Atlantic Coast area has a large poultry-farming industry. Some of these birds die while being raised and disposal of their carcasses has become a problem. If the birds could be used as bait, it would both recycle the dead birds and provide bait for crabbers. The poultry carcasses used in the study were ground and fermented into a safe, semi-solid silage product. The purpose of the research was to determine the effectiveness of poultry silage products as crab bait.

The poultry baits were tested in tray-like tanks and under natural fishing conditions. A panel of people also tested the taste, smell and texture of crabmeat from crabs caught with poultry silage, as compared to meat from crabs caught with menhaden (pogy) fish bait. The tray tests and the actual fishing tests also compared the poultry silage product to menhaden.

Small-scale testing done in local waters using crab traps showed that poultry silage baits attracted crabs in similar numbers to menhaden baits. The researchers then began testing in trays, each with three compartments. Crabs were placed in the largest compartment and allowed to move to one of the two smaller compartments, each baited with different bait.

In the first tray, the crabs selected the poultry silage bait 49% of the time and the menhaden bait 51% of the time. In the second tray trial, 67% of the crabs preferred the poultry bait and only 33% preferred menhaden.

Testing was then moved to baiting crab traps in open waters with either poultry or menhaden baits. Baits were rotated to account for some traps being located in better areas than others. The poultry silage was prepared by packing it for use in sausage casings pierced with small holes. This caused problems immediately, because the pinpoint-size holes plugged up. The casings on the poultry baits had to be slit repeatedly to allow the flavor of the bait to be released in the water. Further research showed that the poultry baits were stable enough to last up to 5 days in traps without casings.

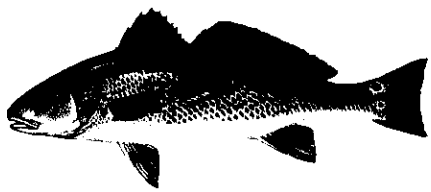
In these actual fishing trials, menhaden baits clobbered the poultry baits in crab catch by as much as 3 to 1. The researchers quickly concluded that tray testing in labs was not as effective in testing crab preference for bait as testing in natural waters. The researchers did gain valuable information on the effects of additives and processing approaches for the attractiveness of baits to crabs and concluded that further testing of poultry baits under natural fishing conditions was worth doing.

The final part of their research used a panel of people to judge the quality of crabmeat from crabs taken with poultry bait as compared to menhaden bait. The panel found no significant difference in taste, smell or texture between the two groups of meat.

Source: *The Use of Poultry Mortalities as an Alternative Bait for the Harvesting of Blue Crabs Callinectes sapidus (Rathbun, 1885).* Tenna F. Middleton, Peter Ferket, Harry V. Daniels, Leon C. Boyd, Larry F. Stikeleather, and Robert J. Hines. Journal of Shellfish Research. Vol. 19, No. 2. 723-729. 2000.

RED DRUM ESCAPEMENT

When to reopen the fishery for redfish in the federal waters of the Gulf of Mexico is a "hot potato" that sooner or later the Gulf of Mexico Fishery Management Council and the National Marine Fisheries Service (NMFS) will have to handle. Much of the discussion to reopen will revolve around "escapement".



Escapement, as defined by NMFS, is a measure of the intensity of fishing on the inshore population of red drum. It is the ratio, expressed as a percent, of the number of fish present at age-4, divided by the number of age-4 fish that would be present if there was no fishery. NMFS has mandated that escapement be equal to or over 30%.

A year ago a SEDAR (Southeast Data Assessment and Review) panel requested from each Gulf state their estimate of redfish escapement from their state's waters. While most of the states were a little unsure of their numbers, they replied. Florida gave several scenarios, with escapement ranging from 18 to 38%. Alabama estimated escapement at 41%. Louisiana provided a 63% escapement number. Texas said

escapement was about 35%, and Mississippi's numbers were estimated at substantially over 30%.

None of the states used the same methods to determine escapement. The thought at the time was to standardize the data between states to get some idea of the status of the stock. That approach has been abandoned and no other action has been proposed.

Most authorities can agree that redfish stocks in the Gulf of Mexico can still be considered as overfished, since redfish can live to 50 years and not all the ages have been rebuilt from before 20 years ago. Where disagreement arises is over whether overfishing for redfish is still occurring. The NMFS position is it is, but that doesn't make sense in light of states' data on escapement.

Unless something really changes, nothing will change for a while. NMFS does not have a full stock assessment scheduled through December, 2008.

PLEASE DON'T FEED THE FISHES!

One of the many benefits promoted as coming from the development of marine protected areas (MPAs), where no fishing is allowed, is the development of ecotourism. Diving and snorkeling have become increasingly popular, and worldwide, millions of divers and snorkelers interact with fish and other marine wildlife.

Unfortunately, many divers/snorkelers, both commercial dive operators and those from private boats, have turned to feeding naturally spread-out fish populations to concentrate them for easier viewing. Feeding has become so common on some MPAs that the practice is beginning to concern some biologists. Feeding fish has several negative impacts.

First, in the majority of cases, the food that is fed to the fish is radically different from their normal diet. For example, very large humphead wrasses died after being fed dozens of eggs, and a large number of soldier fish choked to death on chicken bones. Large groupers have been seen to tear small sacks of food out of divers' hands and swallow them, sack and all. Even frozen fish can be deadly, as deaths of fed wild dolphins have been linked to bacteria in the poor-quality fish.

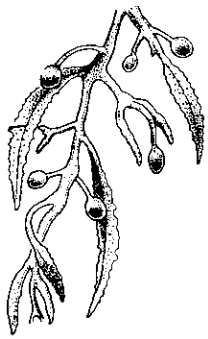
Feeding has also been shown to change the distribution, abundance and behavior of marine fishes. Some species become much more common than normal and can form dense swarms around a diver. Even normally shy species like sharks and moray eels will follow divers to the surface, reducing their natural wariness.

Fish feeding can also degrade the ecosystem at feeding sites. Coral can be damaged several ways and local water quality can be affected by the addition of unnatural nutrients. Feeding can change a balanced ecosystem into something resembling a petting zoo.

The feeding of wildlife on land is long been recognized as a problem and is strictly against the law in all US and Canadian national parks and wildlife refuges. A small, but growing number of scientists is urging anti-feeding laws on MPAs that have the preservation of natural habitats as a goal.

Source: *Divers Feeding Fishes: A Continuing Issue in MPA Management.* William Alevizon, MPA News. Vol. 6, No. 5. November 2004

AMBERJACKS AND SARGASSUM



Several species of the seaweed *Sargassum* exist in the Atlantic Ocean, including the Gulf of Mexico. *Sargassum* is a free-floating golden-colored algae that thrives best in warm, high-salinity waters. In 1996, the National Marine Fisheries Service designated *Sargassum* as essential fish habitat.

Most offshore anglers are well-aware of the superior fishing found near *Sargassum* mats and weedlines. Obviously, weedlines and mats serve to attract smaller animals seeking shelter. Larger predator fish prowl the weedlines looking for prey.

Many of the small animals are the young (juveniles) of larger predators. Scientists have documented the occurrence of many species, but *Sargassum* seems to be particularly attractive to members of the jack family (Carangidae).

The greater amberjack, *Seriola dumerili*, is the largest member of the jack family in the Gulf. It is a reef-associated fish found around the world in warmer waters. It is an important recreational and commercial fish, currently considered to be overfished.

In order to effectively manage a fish species, good information is needed, especially on those factors that affect survival of juveniles. In 2000 and 2001, Texas A & M University scientists studied the distribution and growth of greater amberjack juveniles found around *Sargassum* mats offshore of Galveston Bay, Texas.

The biologists used a tiny mesh 65-foot purse seine to circle *Sargassum* mats. The seine was pursed, the *Sargassum* removed, and the fish were removed from the net's cod end and frozen. The scientists sampled both inshore areas, within 15 nautical miles from shore, and offshore areas, 15-70 nautical miles from shore. The inshore area is heavily affected by Galveston Bay. With each sample, the biologists also measured water temperature, salinity and dissolved oxygen levels.

A total of 181 young-of-the-year greater amberjacks were collected in 42 purse seine sets made in May-July each year. Catch values were four times higher in 2000 than in 2001. In both years, catch rates were higher in the offshore zone than the

inshore zone. Each fish was weighed, measured and had its otoliths (ear bones) removed. A microscope was used to read the daily growth rings in the otoliths' cross-sections. From this, daily growth rates were calculated and fishes' hatching dates were back-calculated.

The average temperature for May-June-July for the inshore area was 84°F in 2000 and 83°F in 2001. The offshore area average was 86°F in 2000 and 82°F in 2001.

Like temperatures, salinities were lower in 2001 than in 2000. Average salinity in the inshore zone was 33.4 ppt (parts per thousand) in 2000 and 28.8 ppt in 2001. Offshore zone salinities averaged 36 ppt in 2000 and 34.9 ppt in 2001. In 2000, salinity rose from May through July. In 2001, salinity dropped from 37.6 ppt in May to 25.7 ppt in June, then rose to 32.3 ppt in July, due to tropical storm Allison.

Dissolved oxygen patterns were similar both years, dropping from May through July. Dissolved oxygen was higher in the inshore zone than the offshore zone.

Catches indicated that juvenile greater amberjack were very common in *Sargassum* mats in May and June, declining in July during both years. The juvenile amberjacks caught ranged from 1.3 to 8.3 inches long. Average sizes of fish also increased from May through June, then decreased in July.

When hatching dates were back-calculated, the fish collected in 2000 were found to have been hatched between January 29 and May 25, with over 80% of the fish produced by March and early-April spawnings. For 2001, calculated hatching dates were January 11 to May 30.

The average growth rate was found to be 1.45 millimeters (0.06 or six-one hundredths of an inch) per day. Growth rates for greater amberjack spawned in April were 2.4 times higher than for fish spawned in March and 3.2 times as high as for those spawned in February. Offshore zone fish also grew slightly faster than inshore zone fish. This was likely due, at least in part, to higher temperatures later than earlier. Other factors such as food availability and predator activity also likely influenced growth.

The survival rate for juvenile greater amberjack *Sargassum* in mats was higher than for other species studied that don't use *Sargassum.* The results of the study indicated to the scientists that *Sargassum* mats in the northwestern Gulf of Mexico serve as nursery habitat for greater amberjack.

No greater amberjack larger than 8.4 inches long have been found associated *Sargassum* beds. At 12 inches long, greater amberjack begin turning up in fishermen's catches. The scientists felt that at between 8 and 12 inches and 5-6 months of age the fish change their lifestyle from being an open-water fish to being a bottom-living fish. In agreement with this change, other researchers have found that at 8-12 inches, greater amberjack shift their diet from crustaceans (small shrimp and crab-like shelled creatures) to a diet of finfish.

Source: *Distribution, Age, and Growth of Young-of-the-Year Greater Amberjack (Seriola dumerili) Associated with Pelagic Sargassum.* R. J. David Mills and Jay R. Rooker. Fishery Bulletin, Vol. 102, No 3. July 2004.

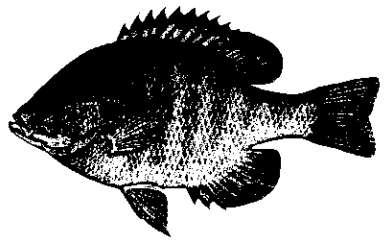
ACTION LIKELY ON A.J.s

Unless a scheduled 2005 stock assessment finds that we have a lot more greater amberjacks than we now think, fishermen can expect more regulations on the species.

In February 2001, the National Marine Fisheries Service (NMFS) declared that greater amberjack were in an overfished state. However, they ruled that overfishing was not still occurring because of recently adopted rules creating a 3-month commercial closed season and a reduction in the recreational bag limit to one per person.

However, by 2003, Gulf of Mexico commercial and recreational fishermen combined were catching 1.5 million pounds over the 2.9 million pound allowable quota. On January 6, 2005, NMFS notified the Gulf of Mexico Fishery Management Council that overfishing is occurring. This gives the Council one year to draw up a management plan to reduce harvests to the 2.9 million pound level — unless the new stock assessment bails the fishery out.

MANAGING BLUEGILLS WITH SIZE LIMITS



Many freshwater fish, especially largemouth bass, are managed with size limits. Other species, such as bluegills seldom are. Populations of smaller than desirable bluegills are usually thought to be over-populated. To correct the situation, biologists attempt to lower bluegill populations by catching and removing them, poisoning them, or increasing the number of blue-gill predators. Attempts have also been made to feed them more food than is naturally available and to change their habitat. Management of bluegills by the use of size limits was not attempted until 1992.

Purtis Creek State Park Lake is a 356-acre, intensively managed reservoir in Texas. Bass are managed as catch-and-release only, resulting in high catch rates for bass over 14 inches long. Only 50 boats are allowed on the lake at a time. In spite of this limited entry, fishing pressure on the lake was very high after the lake opened to fishing in 1988. Anglers fished 124 hours per acre for bluegill alone. Bluegill catch rates were high, but few fish were over 7 inches long.

Because of the small average size on bluegills, a 7-inch minimum size limit was placed on bluegills in late 1992. The biologists expected bluegill harvests to fall right after the regulation was put in place, then to increase as the smaller fish grew to larger sizes. Biologists regularly sampled bluegill populations by electrofishing (shocking) for two years before the regulation and three years after. Collected bluegill were counted, weighed, measured, and aged. The biologists also conducted creel surveys of

fishermen to get estimates of how much they fished, their catch rates and the size of the fish that they caught.

Surprisingly, bluegill sizes in the lake stayed very close to the same after the minimum size regulation as compared to the pre-regulation period. Very few bluegills over 7 inches long were found by electrofishing before or after the regulation. The bluegills in the lake showed a rapid growth rate over the whole study, but very few fish over two years old were found. Bluegills typically don't reach larger sizes until at least four years old. Most interestingly, electrofishing indicated that the number of bluegills in the lake steadily declined from 1990 to 1995.

After the regulation, the amount of fishing for bluegills fell to 39% of what it was before the regulation. Bluegill harvests per hour after the regulation were 42% of what they were before. The large majority of bluegills harvested before the regulation were under 7 inches, with an average weight of only 3 ounces. After the 7-inch minimum was put in place, the average weight of harvested bluegills increased to 5.4 ounces. But, because of the large decrease in numbers of fish kept by anglers after the regulation, the total weight of bluegills harvested from the reservoir dropped to just over 11% to what it was.

The steady decline in the number of bluegills both before and after the size limit was put in place indicates that their death rate from harvest (fishing mortality) was less important than naturally-caused mortality. The level of fishing pressure in the bluegills was not high enough to have caused the decline in numbers. Release mortality was ruled out as a factor, because other studies show that bluegill handle catch-and-release well, and fishing pressure was low from 1992-1995.

Other scientists studying other reservoirs have found a fish population trend in which new reservoirs show explosions in fish numbers that decline after a few years to lower and stable levels. The six years between the flooding of this reservoir and the beginning of the study fits this cycle.

The most likely cause of the bluegill decline was thought by the biologists to be the way that largemouth bass in the lake were managed. Catch-and-release-only rules for bass created a large population of bass large enough to eat bluegills under 7 inches. Few bluegills survived long enough to get three years old or older. Under normal circumstances many bluegill live to age five, and some will survive to eight years old.

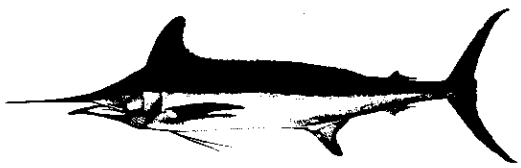
The results of this study show that it is probably unreasonable to expect to be able to manage both for large bluegill and large bass in the same water body. Since the 7-inch minimum size was not benefiting either the fishermen or the fish population, the biologists recommended that it be removed.

Source: *Assessment of a 178-mm Minimum Length Limit on Bluegill at Purtis Creek State Park Lake, Texas.* Richard A. Ott, Jr., Timothy J. Bister, J. Warren Schlecht. Proceedings of the Fifty-fifth Annual Conference, Southeastern Association of Fish and Wildlife Agencies. 2001.

POST-RELEASE WHITE MARLIN SURVIVAL

White marlin (*Tetrapturus albidus*) are considered one of the most overfished species in the Atlantic Ocean. Recently, they were even considered for addition to the Endangered Species List. The overfishing of the species goes back for decades.

While over 99% of recreationally-caught white marlin are now released, they were at one time routinely landed for photo opportunities. Combined reported recreational and commercial landings in the Atlantic peaked at 10.8 million pounds in the mid-1960s, then skidded downward for the next 15 years. Commercial possession of the species has been prohibited since 1988 and under the Atlantic Billfish Fishery Management Plan, all white marlin caught as bycatch on longlines must be released.



Benefits from the release of recreationally-caught white marlin have been hard to measure because survival rates after release were not known. The use of tags has not helped since recapture rates for tagged billfish are so low (0.4-1.83%). In the absence of better data, all recreationally-caught white marlin have been assumed to survive when management calculations for the species are made.

Recent developments in pop-up satellite archival tags (PSAT) have opened new doors into understanding behavior, movement and survival of open-ocean fish. PSATs are 2.5-ounce tube-shaped tags that contain a battery, microprocessor, pressure sensor, temperature gauge, and transmitter. When attached to a fish, they record water depth, temperature and location every few minutes. At a pre-set time, they detach from the fish, float to the surface and send their information to orbiting satellites of the Argos system.

Recently, scientists used PSATs to get survival data on released white marlin tagged with them off of the U.S. mid-Atlantic coast, the Dominican Republic, Mexico, and Venezuela. Tagging was done from private and charter recreational fishing boats. The white marlin were caught on 20-40 lb class line and fought and handled in the manner that recreational fishermen normally handle them.

Hooks were removed when possible and when not, the leader was cut as close to the fish as possible. Half the fish were caught on standard J-hooks and half on circle hooks, these about evenly divided between non-offset and 5° offset hooks. Dead ballyhoo were used as bait. Six of the 41 white marlin tagged had to be resuscitated alongside the moving boat, a normal practice in the recreational fishery.

The tags were anchored about two inches below the dorsal fin. The first 41 marlin caught were tagged with PSATs, although one of the tags never transmitted and was disregarded in the analysis. Of the 40 remaining PSATs, 5 were programmed to detach themselves after 5 days and the other 35 were programmed for 10 days.

If the total, 37 remained on the animals full term. One 5-day tag detached after 2.5 days, but the fish had behaved similar to other fish that survived, so it was assumed to have survived. Two of the 10-day tags detached early, both from the carcasses of fish that did not survive release. The longest distance traveled in 10 days was 300 miles and the shortest distance was 19 miles. Average distance traveled in 10 days was 117 miles.

From the transmitted data, 33 of the 40 fish (82.5%) were seen to survive. Five of the 7 that died did so within 6 hours of release, and 4 of the 5 died within the first hour. Two white marlin died more than 24 hours after release and these were the same two fish that had the longest fight time while hooked. One had a fight time of 46 minutes and died 27 hours after release and the other had a fight time of 83 minutes and died 64 hours after tagging. Both fish spent much of their time before death near the surface.

The type of hook used played a major role in survival. All 20 of the fish caught on circle hooks survived. The survival rate for J-hooked fish was only 65% (13 of 20). It was calculated that white marlin caught on J-hooks were 41 times more likely to be hooked deeply than those caught on circle hooks.

Of the fish caught on J-hooks, half were deep-hooked and 70% of these were bleeding. The study indicated that even fish caught with a J-hook in the jaw could have been hooked elsewhere before detaching and rehooking in the jaw.

All the white marlin caught with circle hooks in this study were hooked in the jaw and only one was bleeding. It should be noted that other studies on the use of circle hooks does show occasional deep hooking. This is especially true for circle hooks that are severely offset (15°).

Eight of the 40 fish tagged in the study became tangled in the line (tail-wrapped) and had to be leadered in tail-first. Four were on circle hooks and 4 were on J-hooks. Five of the tail-wrapped fish required resuscitation and two tail-wrapped white marlin hooked in the jaw with J-hooks died.

Billfish have the ability to evert (turn inside-out) their stomachs and then retract them. Presumably, this is done to get rid of undesired food items or remains. Two of the white marlin in this study everted their stomachs during the fight. One was the fish who was presumed to survive after its PSAT detached in 2.5 days. The other one was hooked in its everted stomach and bled heavily. It died less than 10 minutes after release. No conclusions could be drawn on stomach emersion and survival from this study, but other studies indicate that at least some billfish with everted stomachs survive release.

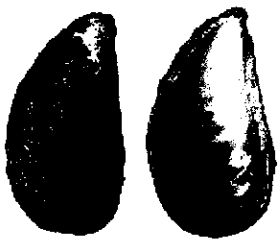
This study provided valuable insights on post-release white marlin survival, but the study was considered too small to be statistically solid. An estimated 200 PSATs

would have to be placed on white marlin to produce such a study. The cost of the tags alone would be $1 million.

Source: *Application of Pop-Up Satellite Archival Tag Technology to Estimate Post-release Survival of White Marlin (Tetrapturus albidus) Caught on Circle and Straight-Shank ("J") Hooks in the Western Atlantic Recreational Fishery.* Andrij Z. Horodysky and John E. Graves. Fishery Bulletin. Volume 103, Number 1. January 2005.

DO YOU NEED TO SMELL MUSKY?

California researchers have discovered what they call "a smoking gun" in common musk fragrances added to perfumes, soaps, shampoos, cosmetics, and air fresheners. While the synthetic musks themselves are not considered harmful, the scientists suspect from this research that they may make other pollutants more toxic.



In their research, the scientists collected wild mussels near the Hopkins Marine Station in Pacific Grove, California. The gills of the living mussels were carefully sliced out and placed in water containing low concentrations (300 parts per billion or less) of 6 commercial synthetic musks. After two hours, the gills were removed, washed, and placed in musk-free water with a special red dye.

Under normal conditions, the cells in the gill tissue would transport the dye out of the gill cells by way of their "efflux transporter" as the dye entered the cells. But, if the transporter is damaged in some way, the red dye would accumulate in the cells.

That is exactly what happened. Gills exposed to musk accumulated the dye, and gills that hadn't been exposed, transported it. This continued to be the case up to 48 hours after the exposure.

The researchers noted that human cells use the same efflux transporter mechanism as mussels. The experiments with mussels, researcher David Epel said, raises the possibility that people exposed to musks and other xenobiotics might have impaired xenophobic defense systems and hence might be increasing their exposure to normally excluded toxins. Synthetic musks are also resistant to breakdown and some quantities are likely to enter natural waters after human use.

Source: *Nitromusk and Polycyclic Musk Compounds as Long-Term Inhibitors of Cellular Xenophobic Defense Systems Mediated by Multidrug Transporters.* Till Luckenbach and David Epel. Environmental Health Perspectives. Volume 113, Number 1. January 2005

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THE GUMBO POT

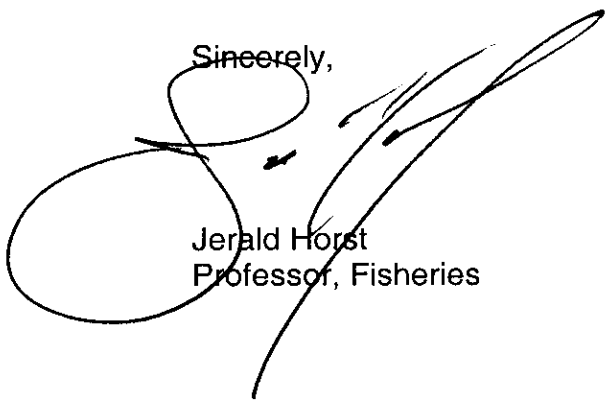
CENLA Seafood Jambalaya

This is an interesting (and very good) recipe for jambalaya and we have Philip Timothy, Hunting and Fishing Editor for the Town Talk Newspaper in Alexandria, Louisiana to thank for it. Jambalaya is considered a Cajun dish, but central Louisiana certainly isn't a hotbed of Cajun culture or cooking. Nor is it considered seafood country. And the recipe.....with all the cans of soup and the fish fillets.....unusual to say the least. But it has four-star taste, and that's what counts. If you love cast iron cookware like I do, be sure to use your No. 8 cast iron pot. It's a perfect fit for this dish!

1½	sticks butter
1	lb catfish fillets
1	lb small peeled shrimp
½	lb crabmeat
1½	sticks butter
2	cups rice
½	cup onion, chopped
½	cup bell pepper, chopped
2	cloves garlic, minced
1	10¾-oz can beef broth
1	10¾-oz can chicken broth
1	10¾-can French onion soup
	Creole seasoning
	salt
	pepper
	lemon juice
½	cup green onions, chopped

Cut the catfish fillets into 1-inch pieces. Rinse the catfish, shrimp and crabmeat. Melt 1½ sticks of butter in a No. 8 cast iron frying pan. Add the fish, shrimp and crabmeat. Season with Creole seasoning, salt and pepper and add a couple of dashes of lemon juice. Sauté ingredients until fish and shrimp are done. Remove from pan and set aside. In a 4-quart Dutch oven (or better yet, your No. 8 cast iron pot), melt 1½ sticks of butter. After the butter is melted, add rice, onion, bell pepper, and garlic. Stir the mixture continuously over medium to high heat. Do not allow it to stick or burn. When the rice turns brown and crunchy, pour in both cans of broth and the can of soup. Add fish, shrimp, crab mixture and stir. Cover and place in a pre-heated 375° oven. Cook for 45 minutes. When done, stir ingredients once, season to taste with salt and pepper and add green onions. Serves 6.

Sincerely,



Jerald Horst
Professor, Fisheries