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Lagniappe

Sea Grant LOUISIANA

December 1, 2003 Volume 27, No. 12

PUBLIC FISHERIES SEMINARS

On Thursday, December 4, the LSU AgCenter's Sea Grant Marine Extension Program, in cooperation with National Fisherman Magazine, is sponsoring a series of free commercial fishing seminars at the International WorkBoat Show at the Ernest M. Morial Convention Center in New Orleans. Sessions begin at 10:30 a.m. with the agenda below. Attendance is free.
MARK YOUR CALENDAR.

10:30 am – 12 noon. Can the Shrimp Fishery Survive – Honest Answers.
The commercial shrimp fishery in the southeastern United States is in extreme financial stress. At prices considered ruinous by domestic shrimpers, investment capital is still flowing into the expansion of foreign shrimp farms. The outlook is for the world supply of shrimp to continue to increase. Can the U.S. fishery survive and if so how? Hear the views of experts, including Jerry Fraser, Editor of National Fisherman Magazine.

1:00 p.m. – 2:00 p.m. Selling Seafood to Restaurants and Small Businesses.
Selling direct and cutting out the middleman is often seen as a method of increasing profits for the commercial shrimper. The vast majority of shrimp in the U.S. are consumed in restaurants and institutions, rather than at home. However, selling in this market demands some business skills. Learn of the opportunities and obstacles in selling to small businesses from Ewell Smith, Executive Director of the Louisiana Seafood Promotion and Marketing Board.

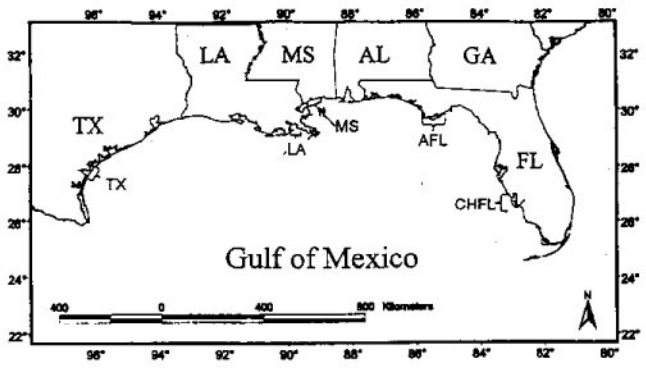
2:00 p.m. – 3:00 p.m. How Shrimpers can take Advantage of Tourism.
Tourism is the biggest growth industry in the United States, and Louisiana and Mississippi tourism growth rates are faster than the national average. Tourists look for the unusual, whether in experiences or foods. Commercial fishing and seafood are exotic to most tourists. Learn how to capitalize on this from Dave Burrage of the Mississippi Sea Grant Program.

3:00 p.m. – 4:00 p.m. Planning and Operating Fishermen/Farmers Markets.
Selling seafood directly to the public may be the most attractive option for many

shrimpers. Direct sales operations must be well-planned or they inevitably fail in a short period of time. Learn how to market direct to the public from the expert – Richard McCarthy of the Loyola Economics Institute and the Crescent City Farmers Markets.

COMPARING TROUT

Speckled trout are probably the most studied estuarine fish in the Gulf of Mexico, yet some questions about their biology remain unanswered. Since they spend most, if not all of their lives in the same estuary, the possibility exists that separate breeding populations have evolved, making fish in widely spaced estuaries different from each other. Two previous genetic studies have indicated that this may be so.



To see if this difference may affect the reproductive biology of the species, six Gulf States scientists recently compared the spawning biology of speckled trout from Charlotte Harbor, Florida (CHFL), Apalachicola Bay, Florida (AFL), Biloxi and St. Louis Bays, Mississippi (MS), Barataria Bay, Louisiana (LA), and Redfish Bay, Texas (TX). Trout from all five areas were weighed and measured, and their egg masses were removed, weighed, and portions of it preserved. The fish were collected over an 18-year period, with trout from different bays collected at different times.

No major differences were found between the bays for size at which 50% of the females reached sexual maturity: 10.4 inches in LA, 11.2 inches in MS and CHFL, 11.4 inches in TX, and 11.9 inches in AFL. Differences were found, however, in the beginning, length and end of the spawning season. Eggs began to develop a month earlier, February-March in CHFL, compared to March-April for the other 4 areas. Spawning ended by September in AFL and MS, and during October in CHFL, LA and TX. Spawning seasons are 5-5½ months in MS and AFL, 6-6½ months in LA and TX, and 7 months in CHFL. In all areas, some females were found to have ended spawning at least a month before the end of the season.

Data on how many eggs laid per spawn was available only for MS, LA and TX. For all sizes of fish, the average number of eggs produced per spawn for MS fish was only about 25% of the number produced by LA and TX trout. The number of days between spawns was roughly 4 to 5 days, although TX fish had the shortest time between spawns and Florida fish had the longest.

The scientists concluded that some small but consistent differences in speckled trout reproductive biology existed between bays. Females from AFL and MS reach sex-

ual maturity at a larger size and have a shorter spawning season, resulting in fewer spawnings during the season. Also, MS fish produce significantly fewer eggs per spawn than LA or TX fish do. The scientists suggested five possible reasons for the differences they found.

1) Some of the differences may be due to the fact that the fish were collected in different years. However, other long-term research in a bay system in Texas showed no significant reproductive changes in specks over 13 years.

2) Since speckled trout do not begin to spawn successfully until water temperatures are above 68°F, temperature differences between the bays could have been a factor. CHFL had temperatures above the minimum by March, which may explain the early start of spawning there. Both MS and AFL had average temperatures barely above the minimum during April and both of these areas had a later start to their spawning season. However, all bays had similar temperatures at the end of spawning season, yet spawning in MS and AFL ended a month earlier than the other areas, so temperature differences cannot fully explain the differences in timing of spawning.

3) Differences in habitat exist. Both CHFL and TX have clear waters and large areas of underwater vegetation. AFL, MS and LA have more turbid water, with little or no vegetation present. The biologists did not feel that was important, as no clear previous research results show that one type area is better for spawning than the other. Also, LA and TX fish showed nearly identical spawning biology, yet the two areas have dramatic habitat differences.

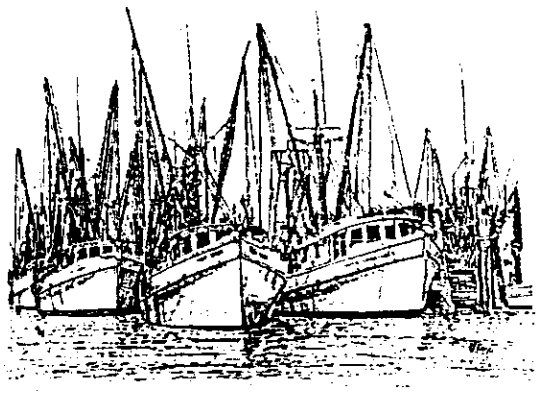
4) Another possibility is that the differences in reproductive biology are genetic. Previous genetic research has produced conflicting results and more is needed before conclusions can be drawn.

5) Salinity differences may have been a factor. Salinities of 20-28 parts per thousand (ppt) are considered ideal for speckled trout spawning and larval survival. Average salinities for MS were below 20 ppt throughout the year and below that level in AFL in the spring (February-May). They were also below that level in LA for May through August. In CHFL they were above that level most of the year, and in TX, they were above 28 ppt most of the year. They felt that the low salinities early in the year, when egg development occurs, may partly account for the delay in the beginning of spawning in MS and AFL, although low salinities in the middle of the season did not affect speckled trout spawning in LA. The continued low salinities, they said, may also account for the early ending of spawning in MS, and the reduced number of eggs per spawn there. They concluded that salinity differences may indeed have caused some of the reproductive differences between bays, but that all five factors may interplay, one upon the other.

Source: *Reproductive Biology of Female Spotted Seatrout, Cynoscion nebulosus, in the Gulf of Mexico: Differences Between Estuaries?* N.J. Brown Peterson, M.S. Peterson, D .L. Nieland, M.D. Murphy, R. G. Taylor, and J. R. Warren. Environmental Biology of Fishes 63: 405-415. 2002

DOING FRACTIONS

One of the most controversial issues facing managers of commercial fisheries is that of whether fishing effort needs to be controlled, and if so, how is it best done. In some fisheries, too much gear, too many vessels, or too many fishermen in the fishery can result in overfishing or in severely reduced profits for each fisherman. Fisheries with too much invested in them are considered "over-capitalized". The shrimp fishery of the Gulf States is considered to be an overcapitalized fishery.



Methods used to directly attempt to control or manage fishing effort have generally been referred to as "limited entry" in the past. Early efforts to directly limit fishing effort involved limiting the number of licenses available for a fishery. Typically, license numbers were capped at the number of people already in the fishery (even if that was too many), with efforts at reductions in numbers coming later. It is possible that the end result can be a reduction in overfishing, but the main benefit is improved profit for the people remaining in the fishery.

Another form of effort management that has been used is individual fishing quotas (IFQs), also called individual transferable quotas (ITQs). Under this approach, the overall quota for a commercial fishery is divided up into smaller quotas for individual fishermen, based upon their record of previous participation in the fishery. Under such a system, quota-holders buy, sell and trade quotas and pieces of quotas until the fishery levels off with a smaller number of people in it. The benefit of IFQ/ITQ management is improved economic efficiency, with more profits to fishermen. Those that choose to leave the fishery under such a system can sell their quotas, rather than leave with nothing.

In 1992, a fisheries economist proposed another form of effort management/limited entry called "fractional licensing." In 1995, the same economist co-authored a paper proposing "fractional gear" permits. Fractional license programs give each vessel a tradable/salable portion of a full license, but require that a vessel can only operate with a full license. By trading among the fishermen, a lower number of vessels, each holding a full license, is left in the fishery. The result is the removal of the desired percent of vessels from the fishery by letting fishermen and the market system work it out. Fishermen who choose to leave the fishery, leave with a payment from the sale of their license.

Such a program is currently in place in the South Atlantic for reef fish (snappers and groupers). The South Atlantic Fishery Management Council established two sets of licenses. One license allows for reef fish harvest under a small trip quota, is not trans-

transferable, and is retired when the license-holder no longer renews it. The other license does not have a trip quota and is transferable, with a major provision. Anyone who now wishes to enter the reef fish fishery must purchase two such licenses from other fishermen and retire one back to the government.

In a fractional gear system, the tradable right is based on gear. When the total amount of fishing gear in the water is reduced, fishermen can use smaller nets (such as trawls) or less numbers of gear (such as traps), or they can buy rights to more gear (larger nets or more traps) from other fishermen. Either way, the total amount of fishing gear in the water is reduced.

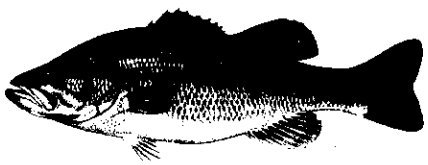
A fractional gear system was first used in the rock lobster fishery in Southern Australia, resulting in a 15% decline in lobster pot numbers. In the U.S., a fractional gear type approach was used for the Florida spiny lobster trap fishery. The number of traps was reduced by 42% and the catch per trap increased by 72% from 1993 to 1996. Overall catches were not reduced by a large amount, and profits for fishermen who remained in the fishery increased.

Fractional licensing and fractional gear programs have been reviewed for possible use in the Gulf of Mexico shrimp fishery.

Source: *Fractional Licensing Program for Fisheries.* R.E. Townsend. Land Economics 68:185-190. May 1992. *Fractional Licenses: An Alternative to License Buybacks.* R.E. Townsend and S.G. Pooley. Land Economics 71:141-143. February 1995. *An Integrated Economic Analysis of Alternative Bycatch, Commercial, and Recreational Policies for the Recovery of Gulf of Mexico Red Snapper.* R Woodward, W. Griffin and Y.S. Wui. Final Report, MARFIN Grant No. NA87FF0420. June 2003.

LIVING TO FIGHT AGAIN

With the growth in catch-and-release angling, it is a common belief that the fish that are released will "live to fight again another day". It can also be heard in tournament angling circles that "bass are too valuable to keep". All of this based on the assumption that released fish survive. Additionally, a high release mortality (death rate) can limit the effectiveness of largemouth bass harvest regulations, especially in areas with high catch rates.



Texas Parks and Wildlife biologists conducted a release mortality study on largemouth bass in Lake Umphrey, a small private lake in east Texas, in the month of August. Two trips were made by 4 teams with 2 anglers per team. Each team used a different bait type: treble hook lures, plastic worms fished "Carolina rigged", live carp under a cork, and live carp on the bottom. Each team fished until it had 30 bass over 14 inches long.

The hooking location was recorded for all fish before they were tagged and placed in the boats' aerated live wells. If the fish was bleeding, it was also noted. For deep-hooked fish, the anglers were given the option of cutting the line and leaving the hook in place. No fish were held in boat live wells longer than 15 minutes before being transferred to a 20-foot deep floating nylon mesh cage. There, the fish were held for 72 hours before release.

At the end of the 72 hours, 22% of the bass had died. The death rate was no higher for fish caught on live bait than for those caught on artificial baits. On the first trip, mortality was 13% for live bait-caught fish, compared to 23% for artificial baits. On the second trip, it was 28% and 23%. The mortality rate was related to where the fish were hooked, however. It was 48% for fish hooked in the throat, 17% for fish hooked in the gill, and 20% for mouth-hooked fish. The percentage of throat-hooked fish was highest with plastic worms.

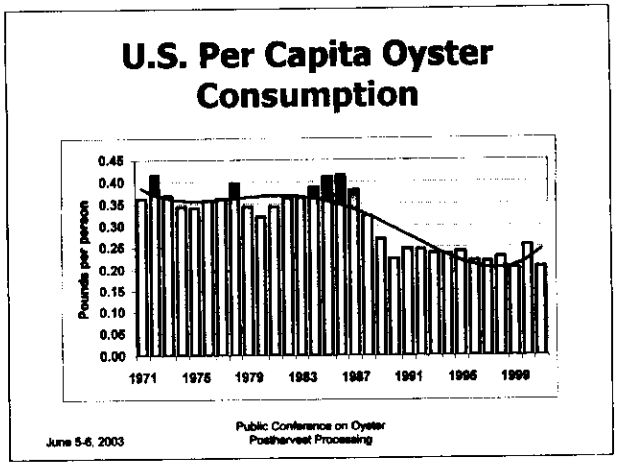
Bleeding was also important. Of the 240 fish captured, 19 were observed to be bleeding and 9 (47%) of these died. Bleeding was observed more often for fish hooked in the throat (48%) and gill (50%) than for fish hooked in the mouth (1%). Anglers cut off and left hooks in 16 of 21 throat-hooked largemouth bass. Eight (50%) of these fish and 2 of the 5 (40%) throat-hooked fish from which the hook had been removed were dead by 72 hours. For all fish, the larger the fish, the lower the mortality was.

The biologists concluded that the type of bait used had little effect on release mortality, so banning live bait use would have little affect. Also, since mortality occurred in mouth-hooked fish, the least severe hooking location, just the action of hooking, playing, landing, and hook removal adds substantially to release mortality.

Source: *Effects of Bait Type and Hooking Location on Post-release Mortality of Largemouth Bass.* Randall A. Myers and Steven M. Poach. Proceedings of the Fifty-fourth Annual Conference, Southeastern Association of Fish and Wildlife Agencies. 2000.

OYSTER CONSUMPTION SURVEY

Consumption of oysters per person in the United States has dropped dramatically since the mid-1980s. At its low in 1999, consumption was half of what it was in 1985-1986. Reduced consumption translates into reduced demand, and indeed, prices for oysters dropped in the 1990s. Some of the decline in consumption can be blamed on negative national publicity about the presence of *Vibrio vulnificus* in Gulf oysters.



V. vulnificus is a naturally occurring bacterium found in warm brackish and salt waters. Filter-feeding shellfish, such as oysters and clams accumulate *V. vulnificus* as they feed. When eaten by a "high-risk" person, the bacteria invade the bloodstream, resulting in serious illness and in half of the cases, death. Only a small percentage of the human population is considered high-risk and includes those with liver disorders, including hepatitis, cirrhosis and liver cancer; hemochromatosis; diabetes mellitus; and those with immunocompromising conditions, such as HIV/AIDS, cancer, or undergoing their treatments. Individuals who take prescribed medication to decrease stomach acid levels or who have had gastric surgery are also at risk.

High risk persons should either not eat untreated raw oysters and clams, or they should eat only shellfish that have been post-harvest processed (PHP) and labeled "Processed to reduce *V. vulnificus* to non-detectible levels."

In October 2002, in a study conducted by the Seafood Technology Bureau of the Mississippi Department of Marine Resources, 511 consumers were surveyed at the Jackson County Fair in Pascagoula, Mississippi. Slightly over 40% of the people in the survey ate raw oysters, with men twice as likely to eat them then women. People 40 years old and older were substantially more likely to eat raw oysters than younger people. People who had attended college were more likely to eat oysters than those who hadn't.

Non-consumers were questioned as to why they didn't eat raw oysters. Only 25% listed personal safety as a reason. Other reasons were: slimy, 42%; appearance, 36%; smell, 27%; would taste bad, 22%; color, 15%; and think grit, 14%. Raw oyster consumers were asked why they eat oysters. Not surprisingly, good taste was the number one reason at 75%, followed by fun to eat, 38%; nutritional benefits, 15%; habit, 13%; aphrodisiac, 5%; and image, 2%.

An important question asked of the survey participants was whether they were aware of the risks associated with eating raw oysters. Eighty-two percent of the raw oyster consumers and 67% of the non-consumers said that they were. Only 11% of the consumers and 18% of the non-consumers were not aware of the risks. When asked if they would eat more raw oysters if health and safety concerns were reduced or eliminated, 76% of the consumers said yes, but only 27% of the non-consumers said yes. Efforts aimed at increasing oyster consumption will have to strongly target people that currently eat oysters. Sixty-six percent of those said that they would eat more oysters if they were available year round, compared to 9% for non-consumers.

Survey participants were asked if they were aware of the methods of PHP — pressurizing, pasteurizing, irradiating, IQF, and heat shocking. Thirteen to 24% of the consumers and 9 to 16% of the non-consumers were aware of PHP, depending on the method. Pressurized PHP was the most recognized method by both groups. In the last year, 15.9% of those in the consumer group had eaten PHP raw oysters, and some had eaten several types. Pressurized oysters led at 7.5%, followed by pasteurized, at 4.1%.

Raw oyster consumers showed a much higher level of interest in buying PHP raw oysters than did non-consumers. Interest was highest in pasteurized oysters,

followed by pressurized oysters, followed at a somewhat reduced level by the other three PHP methods. When asked what they were willing to pay for a dozen PHP oysters, the responses were as follows: pressurized, $4.44, IQF, $3.97, pasteurized $3.89; heat shocked, $3.42; and irradiated $3.11.

Finally, non-consumers were asked what could change their minds to get them to try to eat PHP raw oysters. Their answers are below:

- Guarantee of safe product – 17%
- Education on health benefits – 13%
- Good presentation – 12%
- Get paid to try eating – 11%
- Product should be labeled treated – 9%
- Recommended by a friend of family member – 9%
- Good advertising on nutritional values – 6%
- Knowledge where to get or buy – 5%
- Use of winter oysters – 5%

Source: *Consumer Preferences for Post Harvest Processed Raw Oysters in Coastal Mississippi.* Benedict Posadas, Mississippi State University. Presented at the Gulf & South Atlantic Fisheries Development Foundation Oyster Education Public conference, June 5 & 6, 2003.

OLLIE-GATOR

Texas Parks and Wildlife (TPW) Department wildlife biologists are finding out that alligators are not picky eaters. In the first year of a three-year study, the stomach contents of 54 alligators from the central Texas coast and nearly 100 alligators from the upper coast, near Louisiana, have been sampled. Half of the alligators were under 6 feet in length and half were over 6 feet long.

In both areas, the biologists captured smaller alligators by hand and larger ones, up to 8 feet long, with snares. After capture, the gators were immobilized in duffle bags. Food items were flushed from their stomachs with water delivered through a PVC pipe. While flushing, the alligator's stomach was pressured by hand to force the food items to come out. After measuring and tagging, the alligators were released, little worse for the wear.

TPW biologists on the central coast were particularly interested in whether alligators were feeding on mottled (summer) ducks during their molt period, when they can't fly. All of these alligators, except for 10 from a freshwater lake, came from

brackish-intermediate salinity marshes. They found a few feathers, which couldn't be positively identified as mottled duck, and some mammal hair. The most common food items, found in three-quarters of the stomachs, were mullets and blue crabs.

On the upper coast, in a lower-salinity area, the biologists were mainly interested in alligator predation on pig frogs (cruk-cruks), but were also on the lookout for mottled duck remains in the alligators' stomachs. They found few frog remains and birds remains were uncommon, mainly egrets and gallinules. Lots of mammal fur was discovered, most likely muskrat and nutria, and a good bit of turtle remains, mainly red-eared turtles, were also found. Snakes — mudsnakes, and water snakes — were also eaten.

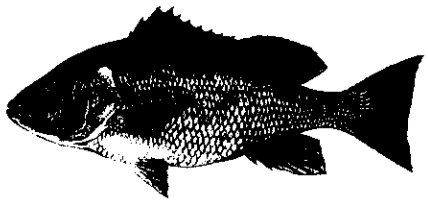
Smaller alligators were eaten too, but fish, especially mullets, dominated the diet, although garfish were not uncommon. No catfish were found, and only a few freshwater gamefish, mainly very small bream, were seen. The only time that gamefish in any number were found was after a low-oxygen fish kill, when the alligators scavenged the dead fish.

Oddities on the upper coast included the jawbone of a small pig, large numbers of rocks, a cigarette lighter, and beer bottles — lots of them. One alligator was found with three different brands of beer bottles. Alligators may nab them when they are floating empties, but all of the bottles in the stomachs were broken. That alligator's grab floating objects is supported by the upper coast study leader who says that during teal hunting season, 25-40% of all gators will have empty shotgun shells in them, often many shells in one alligator. Perhaps the oddest items found were a bunch of alligator eggs in the stomach of a small female and a brass water faucet found in another alligator.

It should be noted that these are preliminary observations from the biologists in the field that are doing the sampling. Stomach contents were frozen for more detailed laboratory analysis at a later date. Two more years of sampling are also planned before a final report is prepared.

Source: Personal communication with Marc Ealy and K.J. Lodrigne. Wildlife Division, Texas Parks & Wildlife Department.

RED SNAPPER AGE & GROWTH



Red snapper are easily the most popular offshore bottomfish in the northern Gulf of Mexico. Because of their popularity, they became overfished. Monitoring the restoration of red snapper populations demands good data. Some of the most important data is on age and growth of the fish. LSU scientists have recently conducted the largest ever age and growth study on the species.

Researchers from LSU and the Louisiana Department of Wildlife and Fisheries sampled 3791 red snappers from commercial and recreational catches landed between

the Mississippi River delta and Galveston, Texas, although most of the fish were from landings at Grand Isle and Port Fourchon, Louisiana. The fish were sampled over an eight-year period. Each fish was weighed and measured, sex was determined where possible, and both otoliths (earbones) were removed. Each otolith was weighed, embedded in an epoxy resin, and then cut in a thin cross-section with a special saw. Age was determined by reading the annuli (rings) in the otolith. Each otolith's annuli were counted separately by two readers. When they didn't agree, each counted the annuli again. With this method, agreement was reached on 99.3% of the otoliths.

Of the fish for which sex could be determined, 1438 were male and 1542 were female. Males ranged in size from 9.8 - 37.8 inches and 0.4 - 30.1 pounds. Females' sizes were 9.7 - 41.6 inches and 0.4 - 50.1 pounds. Not until age 5 and 16.8 - 17.6 inches in length were 100% of the fish mature.

The vast majority of the fish examined were 2 to 5 years old and only 1.2% were older than 15 years old. However, between the ages of 16 and 52, the only ages that were not represented in the study were 24, 28, 31, 34, 39, 40, 42-46, 49 and 50. Red snapper age 0 (under one year old) and age 1 were not available in any numbers for the study because the minimum size limit prevented their landing. The scientists speculated the large number of 2-5 year old fish in the sample might be partly due to the preference of commercial fishermen and wholesalers for smaller "plate-size" fish.

The biology of the fish may also have played a role. Age 1 and younger red snapper, besides being mostly undersized, tend to be found on open bottoms where few people fish, rather than near reefs. After age 1 they move to reef type habitats, including offshore platforms. After age 6, they move away from structures and again spend more time on less-fished open-bottom areas.

The study results showed that male and female red snapper grow rapidly and at about the same rate until about 8 years old and about 28 inches in length. Then two things happen. The growth rate for both genders begins to slow down, and the growth rate becomes slower for males than for females. The growth gap continues to widen until about age 25 and then it stabilizes. At that age, males average less than 36 inches and females average 38 inches in length. Very little growth occurs after age 25, even out to over 50 years of age.

These are average numbers. The researchers pointed out that some individual fish grow much faster than others do. For example, at age 8, one fish was 17 inches long and another was 35 inches in length. A 16-inch fish could be anywhere between 2 and 7 years old, a 24-inch fish could be 3 to 9 years old, and a 32-inch could be from 5 to over 35 years old.

The two oldest fish in the study were 52.6 and 51.7 years old but were only 34 inches and 34.5 inches long and weighed a modest 17.3 and 20.2 pounds. The biologists also aged the IGFA world record red snapper, caught by Doc Kennedy off Grand Isle, Louisiana in 1996. Given its huge size of 50 lb, 4 oz, a person would expect

it to be an ancient fish. However, after it was aged, the fish proved to be slightly less than 20 years old.

This was easily the largest and most detailed study done on red snapper age and growth. However, the scientists still expressed concern that more data on older, larger fish is needed.

Source: *Age and Growth of Red Snapper, Lutjanus campechanus, from the Northern Gulf of Mexico off Louisiana.* Charles A. Wilson and David L. Nieland. Fishery Bulletin 99: 653-664. 2001.

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THE GUMBO POT

Creamed Crabmeat Casserole

Shhh; a not so big secret; if a recipe has crabmeat and cream in it, it has to be good. And this one is no exception. I have presented it here as a casserole, but you can delete the breadcrumbs and serve it on toast points or with crackers as an appetizer too. It's good either way.

¾	stick butter	½	tsp salt
½	medium onion, chopped	¼	tsp red pepper
1	lb crabmeat	1	tbsp green onion, minced
3	tbsp flour	2	egg yolks, beaten
1½	cups half & half cream		Creole seasoning
½	tsp dry mustard	½	cup breadcrumbs

Melt butter in saucepan. Add onion and sauté for about ten minutes over medium heat. Add crabmeat, mix, and cook for 5 minutes. Add half & half, constantly stirring until the mixture boils. Mix mustard, salt, pepper and green onions with beaten egg yolks. Add some of the crabmeat mixture, than mix the egg yolk mixture into the crabmeat. Season to taste with Creole seasoning and place in a casserole dish. Sprinkle bread crumbs on surface and heat in 350°F oven until bread crumbs are lightly browned, about 20 minutes. Serves 3 – 4.

Sincerely,

Jerald Horst
Associate Professor, Fisheries