



What's Cooking

A QUARTERLY PUBLICATION OF THE SOUTH CAROLINA AQUARIUM'S

----- Sustainable Seafood Initiative -----



2011, Issue 1

Upcoming Events

SSI Dinner Series

March 14 - Fleet Landing

April 22 - Wild Dunes

May - Tristan

June - Amen Street

July - Carolina's

September - Blu Restaurant & Bar

2011 SSI Events at the Aquarium

April 12 - Wine on the Water

August 30 - Brew with a View

October 11 - Wine on the Water

If you would like to host a dinner or participate in events at the Aquarium please let us know.

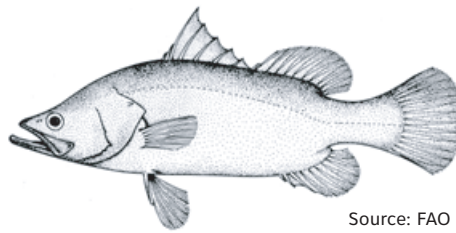
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Partner Updates

Welcome to the newest SSI partner: Oak Steakhouse, who completed a menu assessment upon joining SSI and was awarded Platinum Partner status. In addition, The Rice Market and Pane e Vino also completed menu assessments and were both awarded Platinum Partner status.

Seasonal Seafood Feature: Barramundi



Source: FAO

Winter is a slow time for local, wild caught seafood in the southeast, and winter storms frequently disrupt the harvest in other parts of the country. But winter is the perfect time to feature farm-raised sustainable products. Local shellfish, clams and oysters, are fantastic options as are farmed trout and striped bass. But there is another farmed fish increasing in popularity: barramundi.

Barramundi is a large, warm-water perch-like fish native to the Indo-West Pacific Ocean. It is related to snook, a gamefish in the southeast U.S. and Caribbean. Barramundi are commercially harvested from the wild throughout their native range and are farmed in Southeast Asia, Australia and the U.S.

Though naturally carnivorous, barramundi can thrive on a grain-based diet in proper conditions (i.e. optimal temperature, salinity, and oxygen levels) but still produce high levels of omega-3 fatty acids. The meat is mild and flaky, similar to sea bass.

The majority of farmed barramundi production occurs in floating cages, which can have negative impacts on the surrounding environment if not properly monitored and managed. Some farms in Australia and the U.S. use recirculating tank systems, a more sustainable method.

Australis Aquaculture operates a closed-containment farm inside a building in Turner Falls, Massachusetts. Though Australis raises non-native fish, escapes from a closed-containment facility are nearly impossible. This facility purifies and reuses 99% of their water and fish manure is filtered out and used as fertilizer on local farms.

In addition, Australis has minimized the use of fishmeal and fish oil by providing a nutrient rich diet and ideal environmental conditions that lower the fishes' energy use. What fishmeal and oil they do use is sourced from sustainable fisheries. Australis does not use hormones, antibiotics or colorants.

Barramundi is naturally well suited for aquaculture. They are fast growing and robust, tolerating a range of

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Our goal is to promote the conservation of fishery resources and the use of sustainable, especially local and domestic, seafood in restaurants.

environmental variables including both fresh and saltwater, and do well in high density settings. Australis' farmed barramundi is a very sustainable product. Ask your purveyor if they carry this product or visit Australis at www.thebetterfish.com to find a source.

Sources: www.fao.org/fishery/culturedspecies/Lates_calcarifer/en; www.fishbase.org; www.thebetterfish.com

Red Snapper

Red snapper is undeniably one of the most popular and best known seafood items, and because of this demand it has become one of the most tightly regulated fisheries in the United States. Here in the southeast, red snapper has been making headlines for the past two years after the population was found to be severely overfished and the fishery completely closed to harvest.

Interestingly, this closure did not have a substantial impact on the supply of snapper in the U.S. in part because the population is small compared to the Gulf of Mexico stock, but also because the U.S. snapper market is dominated by imports. The U.S. produces around 10 million pounds of snapper (multiple species) every year, but imports 30-40 million pounds.

Red snapper has also been the focus of a number of seafood fraud probes in the last five years. Because of the name recognition and popularity of red snapper, many seafood sellers have incorrectly labeled a multitude of fish as "red snapper" (some are snappers, some are not). Though legal in most states, this sort of mislabeling is discouraged by the U.S. Food and Drug Administration (FDA). According to the FDA, the only fish that should be sold through U.S. interstate commerce as red snapper is *Lutjanus campechanus*, the species we know as American red snapper, which is found in the U.S., throughout the Caribbean, and as far south as Brazil.



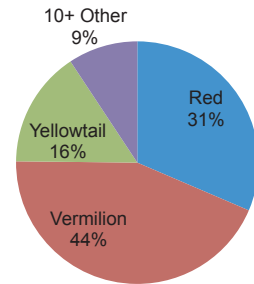
The native range of American red snapper.

Source: fishbase.org

Red snapper are common throughout their range, but are not necessarily the dominant or most common snapper. In the U.S., red snapper historically comprised

about half of U.S. snapper production, but due to conservation needs, the harvest has been restricted and it now comprises only about 30% of the harvest. Vermilion snapper now dominates harvest at around 45%, yellowtail snapper is the next most common at 15% of harvest, and 10-15 other snappers make up the remaining 10% of harvest.

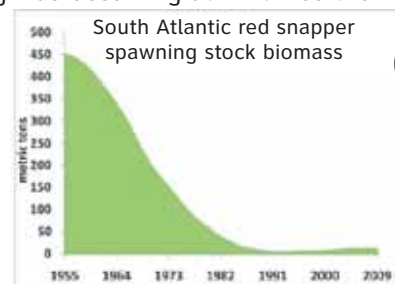
U.S. Snapper Harvest by Species



Source: noaa.gov

U.S. Atlantic

In the U.S. Atlantic, red snapper is classified as both overfished (depleted) and experiencing overfishing (an unsustainable harvest rate). The 2008 stock assessment indicated that overfishing was occurring at 14 times the sustainable level. The decline in the population size began in 1950s, reaching low levels in the 1960s but continuing to decline into the 1980s until the population was less than 5% its original size.



Source: fishwatch.noaa.gov

The age structure of the stock has also been truncated, meaning there aren't many older fish. A lack of older females means that the productivity of the stock is greatly reduced because older females have far more and healthier offspring. Red snapper can live as long as 50 years, but currently less than 1% of stock is 10 years old or older.

Based on this information, the fishery was completely closed to harvest at the beginning of 2010. And because of the severe degree of overfishing, the federal government was also forced to consider a large area closure off the coasts of Georgia and Florida where no snapper or grouper fishing would be permitted, all in order to avoid any accidental capture and mortality of red snapper.

A new Atlantic red snapper stock assessment was completed in late 2010 and indicated that red snapper is still overfished and still undergoing overfishing, but also

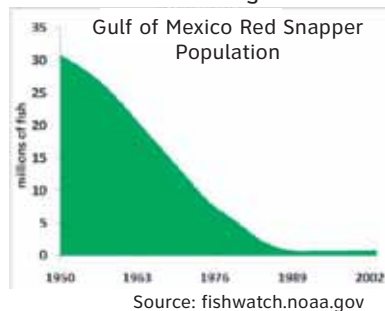
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showed that the stock is in slightly better condition than indicated by the 2008 assessment and the degree of overfishing is slightly less. The population size has increased because of some good reproductive years and fishing restrictions in the recent past, but the increase is not nearly sufficient. But fortunately the slightly better status negated the need for the area closure; the harvest moratorium in place for red snapper should be sufficient to end overfishing, as required by law.

In all likelihood the red snapper fishery will remain closed for at least the next few years. As the population recovers a limited harvest might be permitted, especially in order to reduce dead discards of red snapper that are bound to be caught accidentally by fishermen targeting other snappers and groupers. Before the harvest closure was enacted the annual red snapper harvest in the Atlantic averaged to around 150,000 pounds a year. When rebuilt to the target population size (in about 40 years...) the population is projected to potentially yield a sustainable harvest of over 1 million lbs every year.

U.S. Gulf of Mexico

U.S. Gulf of Mexico red snapper is also overfished. In 2005 the breeding population was estimated to be approximately 6% of the target size that would produce the maximum sustainable yield. The stock status of red snapper has been known to be poor for quite some time, but inadequate management measures allowed overfishing to continue until strict regulations were implemented in 2007 and 2008. These regulations included drastically reduced annual catch limits and a limited access privilege program (catch share) that allocated specific amounts of harvest to specific fishermen.



Historically, a substantial portion of red snapper mortality was caused by shrimp trawls, which captured unmarketable juveniles as bycatch when they were mere inches in length. This bycatch mortality contributed to overfishing and has hindered rebuilding. Shrimping effort has decreased substantially (approximately 75%) since the early 2000s because of market pressure, fuel prices, and hurricane damage. The associated decrease in red snapper bycatch mortality exceeded the reduction

required by the 2007 regulations and has helped the red snapper population rebuild faster than anticipated.

Now the Gulf red snapper stock is managed under a rebuilding plan and is rebuilding faster than anticipated, allowing an increase in the 2010 commercial harvest quota (2.55 million pounds to 3.5 million pounds). Overfishing ended in 2009, thus NOAA has proposed a further commercial harvest increase of another 100,000 lbs for this year. The Gulf of Mexico breeding population is now 18% of the target size that would produce maximum sustainable yield and is predicted to achieve a complete recovery in 2032.



American red snapper

Ecosystem impacts

The primary gear used to harvest red snapper in both the Atlantic and Gulf of Mexico is hook and line, which has very little impact on marine habitats. In the Gulf of Mexico, a very small portion of the overall catch is harvested with bottom longlines, which can have a more substantial impact. Bottom longlines are designed to sink instead of float like pelagic longlines used to catch tuna and swordfish, thus the lines can become tangled on delicate corals and rock formations, causing habitat damage. Many such sensitive areas in the Gulf of Mexico have been closed to bottom longlining.

A moderate amount of bycatch occurs in hook and line fisheries, primarily due to the required release of undersized fish or prohibited species, which is accounted for in stock assessments. In addition, sea turtles can be caught by these gears, especially longlines, but fishermen must abide by the careful release protocols described by the National Marine Fisheries Service to minimize injury to sea turtles. In addition, new regulations have been developed to close shallower areas of the Gulf of Mexico where turtles are more present on the seafloor. The bottom longline fishery will only be permitted in deeper waters where sea turtles are far less likely to be foraging near the ocean bottom.

The 2010 Gulf of Mexico oil spill is a wild card right now. Fishing closures due to the spill may have prevented harvest of some snapper and decreased bycatch mortality from shrimp trawls, but the oil also could have had a negative effect on spawning success. It is too soon to determine what, if any, impact the oil spill had on the Gulf of Mexico red snapper population.

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Imported snapper

A variety of snapper species are imported from multiple countries in Central and South America, as well as the Western Pacific. The top five snapper suppliers to the U.S. market are Mexico, Brazil, Nicaragua, Panama, and Suriname. Most of these countries harvest American red snapper, but they also harvest substantial amounts of Caribbean red, mutton, yellowtail, dog, lane and silk snappers. Nicaragua and Panama also harvest snapper off their Pacific coasts.



Mutton snapper

Most countries in South and Central America have collected limited amounts of fisheries data and have minimal if any fishery management regulations. Snappers live a long time and have low natural mortality, a small length at first capture (usually before the fish become mature), and are sensitive to fishing pressure and easily overfished if not well managed.

In the southern Gulf of Mexico, where the majority of Mexico's snapper harvest occurs, American red snapper accounts for 90% of snapper landings and nearly the entire catch is exported to the U.S. The population of red snapper in this region decreased by 51–64% between 1984 and 2002 and the fishery is considered overfished/depleted because production has experienced a fourfold decline between 1992 and 2005. Regulations are limited to a permit requirement, restrictions on hook size, and annual catch quota of



Dog snapper

groupers and snappers for Cuban fleet that is permitted to fish in Mexican waters.

Little information is available concerning the stock status and sustainability of snappers in the southern Caribbean and Pacific where Nicaragua and Panama harvest snapper. Nicaragua does employ minimum size limits to restrict harvest of juvenile fish and Panama prohibits the use of gillnets, an indiscriminate gear with large amounts of bycatch used to harvest snapper in many places.

In the western Atlantic, where Brazil and Suriname harvest snapper, slightly more information is available. Stock assessments have been performed for five snappers of commercial interest off northeast Brazil: mutton, yellowtail, dog, lane and silk snapper. All but silk snapper were found to be overexploited and needed

80-90% reductions of fishing mortality to be sustainable. Caribbean red snapper (very closely related to American red snapper) used to be an important fishery product, but the stock began to decline in late 1970s and in the 2000s the fishery shifted to other species.

Though Venezuela is not a major source of snapper according to import statistics they are responsible for most of the harvest from Suriname and nearby Guyana. Both of these nations allow Venezuela's fishing fleets to harvest fish in their territorial waters but require that part of the harvest be landed at local ports. Many of these fish are then exported to the U.S. Conservation of fishery populations is not a major concern of any of these countries and fishing regulations are minimal.



Silk snapper

Another type of snapper available in South Carolina is the dotted rose snapper from Pacific Costa Rica. Little information is available on snapper fisheries in Costa Rica. Most coastal fish are harvested by small boat artisanal fishermen, but the fleet is likely far larger than the fish populations can support and there is evidence that these fisheries are already overfished. For economic reasons, the Costa Rican government has not attempted to reduce fleet capacity. There has been no



Lane snapper

stock assessment of dotted rose snapper populations and there are no country wide management regulations.

Sustainable Snapper

U.S. caught snapper are the most sustainable option. Both vermilion and yellowtail snapper are sustainable choices whether from the U.S. Gulf of Mexico or Atlantic Ocean – their populations are healthy and fishing effort is sustainable and controlled. In addition, red snapper from the Gulf of Mexico is



Vermilion snapper



Yellowtail snapper

definitively on the right track. The population is recovering faster than expected, thus can be considered moderately sustainable.

Sources: U.S. FDA; NOAA Fisheries; Fishbase.org; SEDAR; FAO; Brulé et al., 2010; Frédoú et al., 2009

**All fish images by Duane Raver

What's Cooking is a quarterly publication from the Sustainable Seafood Initiative at the South Carolina Aquarium. Please contact Megan Westmeyer at (843) 579-8502 or mwestmeyer@scaquarium.org with any questions or to be removed from this distribution list.