WATER LOG

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Red Snapper

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Cover art courtesy of Tom Hart.

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Sandestin, FL

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Mississippi Bar Annual Meeting & Summer School

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36th International Conference on Coastal Engineering

Baltimore, MD

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http://www.icce2018.com

The Old Magnuson-Stevens Act and the Sea:
How Fishery Management Plans Are Implemented and Enforced

Morgan Stringer

In 1976, Congress addressed overfishing and the impending collapse of economically vital fishing stocks with the Fishery Management and Conservation Act, which authorized the federal government to manage fisheries out to 200 miles from the shore. The act was amended twice to clarify terms, strengthen provisions, and emphasize rebuilding fisheries alongside conserving them. These acts collectively are known as the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA authorizes the government to create regulations to manage fisheries and enforce violations of those regulations.

The National Marine Fisheries Service (NMFS) of the Department of Commerce issues regulations based on fishery management plans under the MSA. Regional councils, known as fishery management councils (FMCs), are also involved with managing fisheries. Eight regional councils advise the NMFS, create fishery management plans, and amend plans when needed. These councils are responsible for fisheries in federal waters seaward of their region. A fishery can refer to a species of fish, a type of fish, the type of equipment used to harvest the fish, or the geographical region of a species. For example, instead of a "red snapper" fishery, red snapper are managed with other reef fish in the Gulf of Mexico under the Gulf of Mexico Reef Fishery Management Plan, but in the Atlantic Ocean are managed under the South Atlantic Snapper-Grouper Fishery Management Plan.

The MSA in Action: How a Fishery Management Plan is Developed

Creating a fishery management plan (FMP) involves several steps. First, NMFS finds that a fishery is "overfished." Overfished means a level of fishing mortality that jeopardizes the capacity of a fishery to "produce the maximum sustainable yield on a continuing basis." Maximum sustainable yield (MSY), is the largest long-term average that can be taken from a fishery under the current conditions. Current conditions include ecological conditions and the type of gear used for fishing that fishery.[1] MSY is based on the best scientific data available and updated to accurately reflect conditions.[2] For example, NMFS determined that Gulf of Mexico gray triggerfish were subject to overfishing because the total landings of the fish were greater than what could maintain a sustainable population, according to scientific research.[3] When a fishery does not have enough fish within the population to reproduce and sustain an adequate population, then the consequences could be disastrous to the ecosystem. Fishery collapse would be devastating to the fishing industry as well. If overfishing depletes fisheries, then not enough fish will be left to support future harvests, endangering the livelihoods of fishermen.

Once a fishery is determined to be overfished, NMFS notifies the appropriate regional council that it has one year to create a fishery management plan (FMP) to reduce overfishing and rebuild the stock. Voting members on a fishery management council include: the regional NMFS Administrator, representatives from affected states' marine management agencies, and qualified fishing industry, academic, and environmental representatives nominated by their states. The Council is advised on the best available data by a Scientific and Statistical Committee,[4] as well as by nonvoting members from the Coast Guard, U.S. Fish and Wildlife Service, and the U.S. Department of State. The FMP must specify an amount of time required for rebuilding the fishery in the plan. This time period must be as short as possible to rebuild the fishery, and it cannot exceed ten years, except in cases of fish with longer life-cycles where a longer term may be allowed. For example, the most recent red snapper rebuild

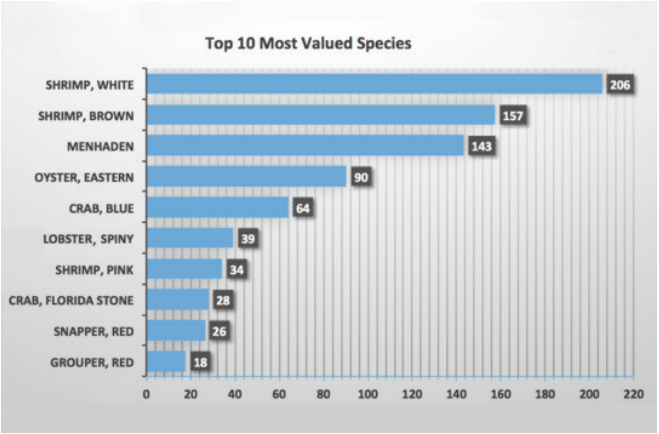
date was set at just under 32 years. These plans establish different management measures such as, the required annual limits on catches, gear restrictions, and fishing seasons.

An FMP is subject to a review under the National Environmental Policy Act, which includes seeking public input on draft and final reviews of the environmental impacts of the project. Once the Council has produced a final document, NMFS has 30 days to approve the FMP, in whole or in part. The plan must comply with the MSA and all other relevant laws.[5]

The Ten National Standards

FMPs are governed by the Ten National Standards, legally-enforceable factors that each plan must follow. They address scientific as well as socio-economic factors. The plan must:

1. Provide for the "optimum yield" for each fishery,
2. Be based on the best scientific information available,
3. Individual stocks of fish are to be managed as a single unit throughout their range, and interrelated stocks shall be managed in close coordination, to the extent practicable,
4. Not discriminate between members of different states. If allocation is necessary, then it must be fair and equitable, reasonably calculated to promote conservation, and carried out so that no one gets an excessive share,
5. To the extent practicable, consider the efficiency of the plan, but this calculation cannot be made on economic considerations alone,
6. Allow for variations and contingencies in the fisheries and catches,
7. Minimize costs and avoid unnecessary duplication where practicable,
8. Take into account the importance of fishery resources to communities by using the best available economic and social data to provide for sustained participation of these fishing communities and to the extent practicable minimize adverse economic impacts to these communities,
9. To extent practicable, minimize bycatch and minimize the mortality of unavoided bycatch, and
10. To extent practicable, promote safety of human life at sea.[6]



Source: Benedict C. Posadas, PhD., Mississippi-Alabama Sea Grant Consortium

The "optimum yield" is slightly different from the maximum sustainable yield discussed previously. The maximum sustainable yield is concerned with quantifying the greatest amount of fish that can be taken in current conditions before it is overfished. The optimum yield is the number of landings that "will provide the greatest overall benefit to the Nation…"[7] In other words, the optimum yield is the highest amount of fish that can be taken in order to benefit fishers and the communities that depend on the industry, while leaving in place the most ideal population in the ecosystem to allow fishing to continue at those levels into the future. The optimum yield may be lower than the maximum sustainable yield.

Another term of art in the national standards is "bycatch." Bycatch are fish or other animals that are unintentionally captured by a fishery while catching the intended fish.[8] For example, shrimp trawlers' gear often catch juvenile red snapper, which are discarded by the shrimpers. Bycatch does not have to include undesired fish. Dolphins caught in tuna nets or albatross caught on squid long-lines are bycatch as well. Also, fish that are too juvenile or small to be kept are bycatch.

If an FMP does not adequately consider the National Standards, the plan must be rejected. If it complies and is approved by NMFS, then it is published in the Federal Register. There is a 60-day public comment period. The NMFS has 30 days from the end of the comment period to consider the comments, then approve, disapprove, or partially approve the plan. Once approved, the final plan is issued as federal regulations in Title 50 of the Code of Federal Regulations.[9]

Enforcement

The MSA is enforced by NMFS and the Coast Guard.[10] All catches from managed fisheries must be reported in order to determine that the stock continues to be self-sustaining. This largely relies on self-reporting by vessels and anglers. Additionally, the government uses observers on vessels to record data and ensure compliance. Regulation and enforcement is still largely reliant on self-reporting, so false data could greatly harm the government's ability to gather the most accurate data on which the FMPs rely.

Photograph courtesy of Gerald Carter.

Whenever a violation occurs, such as fishing out of season, catching too many fish, or misrepresenting the quantity of fish harvested, a civil penalty is assessed, which can be no greater than $100,000 per violation. Each day of a continuing violation is considered a separate offense. When assessing the penalty amount, the NMFS considers the following: circumstances, gravity of the offense, degree of culpability, and history of prior offenses. A violator's ability to pay may also be considered. A civil penalty can also lead to a revocation of an MSA permit to fish.[11] Furthermore, the MSA provides for criminal penalties. These penalties can be imposed for a variety of acts including: interfering with NMFS observers aboard vessels, interfering with Coast Guard enforcement, or for submitting false data to the government relevant to the MSA.[12]

Gulf Council Managed Fisheries

The Gulf of Mexico Fishery Management Council manages fisheries in federal waters of the Gulf of Mexico. The Gulf Council manages a number of fisheries, including different varieties of reef fish under the Gulf of Mexico Reef Fish Management Plan.

Types of Fish Managed	Species Within Management Plan
Coastal Migratory Pelagics	King mackerel, Spanish mackerel, Cobia
Red Drum	Red drum
Reef Fish: Snappers	Queen snapper, Mutton snapper, Blackfin snapper, Red snapper, Cubera snapper, Gray (mangrove) snapper, Lane snapper, Silk snapper, Yellowtail snapper, Wenchman, Vermillion snapper
Reef Fish: Groupers	Speckled hind, Goliath grouper, Red grouper, Yellowedge grouper, Warsaw grouper, gag, Scamp, Yellowfin grouper
Reef Fish: Tilefishes	Goldface tilefish, Blueline tilefish, Tilefish
Reef Fish: Jacks	Greater amberjack, Lesser amberjack, Almaco jack, Banded rudderfish
Reef Fish: Triggerfishes	Gray triggerfish
Reef Fish: Hogfish	Hogfish
Shrimp	Brown shrimp, White shrimp, Pink shrimp, Royal red shrimp
Spiny Lobster	Caribbean spiny lobster
Coral	Hydrozoa corals (stinging and hydrocorals), Hexacorals (stony and black corals); Over 140 species of coral are within this management plan.

In addition to the fisheries listed in the chart above, the Council also regulates aquaculture in federal waters.[13]

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Endnotes

1. 16 U.S.C. § 1802(34).
2. 50 C.F.R. § 600.310 (e)(1)(v)(A).
3. 83 Fed. Reg. 9298 (March 5, 2018).
4. 16 U.S.C. § 1852(g).
5. 16 U.S.C. § 1854.
6. 16 U.S.C. § 1851.
7. 16 U.S.C. § 1802(33).
8. 16 U.S.C. § 1802(2).
9. 16 U.S.C. § 1854.
10. 16 U.S.C. § 1861(a).
11. 16 U.S.C. § 1858.
12. 16 U.S.C. § 1859.
13. Gulf of Mexico Fishery Management Council, *Implemented Fishery Management Plans*.

The Temptation of Red Snapper

Kristina Alexander

The Magnuson-Stevens Fishery Management Act (MSA) is not unlike the Stanford marshmallow experiment. In the marshmallow experiment, a child is told that she may have the marshmallow (or other treat) that's in front of her now, or if she waits a little while, she can have a larger reward, like twice as many treats. The experiment tests delayed gratification – the ability to get a bigger payoff by resisting temptation for a moment. In the same way, under the MSA, when stocks are overfished, fishers may have to land fewer fish for a while in order to establish sustainable populations in the long run. However, it is not clear anybody has passed the marshmallow test when it comes to red snapper.

1984 Fishery Management Plan

Gulf of Mexico red snapper "is one of the most important recreational fisheries in the world."[1] Quotas on red snapper are the result of different management approaches to allow red snapper fishing (both commercial and recreational) to continue at levels that would allow the stock to rebound. The Gulf of Mexico Fishery Management Council (the Council) developed a Fishery Management Plan (FMP) for red snapper (and other reef fish) in the Exclusive Economic Zone (EEZ), also known as federal waters. The National Marine Fisheries Service (NMFS) of the Department of Commerce approved the FMP in 1984 – prohibiting, among other things, the use of explosives for taking the fish. The FMP was premised on a stock assessment finding that "reductions in fishing mortality on the order of 60 to 70 percent would be necessary by the year 2000 …. to restore each species." (55 Fed. Reg. 2078 (Jan. 22, 1990).) The fishing season was year-round. A minimum size limit was set at 13" total length, but with many exceptions.

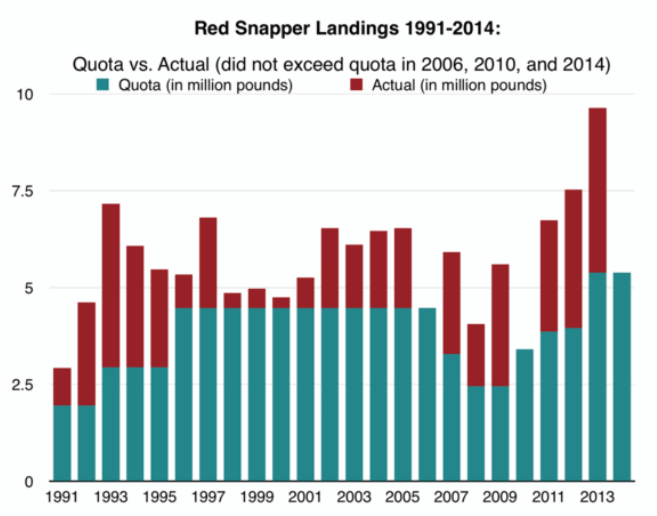
Red Snapper Management under the MSA

After decades of red snapper management under the MSA, there are neither marshmallows nor a rebuilt population of red snapper in the Gulf of Mexico. In 2005 it was reported that the population was between three and seven percent of its historic levels.[2] It could be argued that delayed gratification was not enough of an incentive for recreational fishermen to alter how they land red snapper, even in the face of mandatory limits. While recreational fishermen are not solely to blame for the decline of red snapper stock – blame can also be attributed to juvenile bycatch by shrimpers, and to commercial harvests, which have high mortality rates for undersized snapper bycatch – their behavior is not without stain. Despite yearly limits on red snapper landings, in 21 out of 24 years since 1991, recreational fishermen have over-harvested their red snapper quotas by as much as 250%. The overages occurred even while the quota was gradually increased from 1.96 m lbs in 1991 to 5.39 m lbs in 2014.

Because the number of eggs produced by a red snapper climb exponentially based on age, delaying the harvest of large numbers of snapper has obvious benefits. Gulf red snapper reach full maturity in 6-8 years. A 10-year old red snapper can produce 60 million eggs a year. Significantly, a 30-inch red snapper lays as many eggs per season as 100 13-inch snappers.

Rebuilding Goals

The MSA requires that harvest numbers must be at an optimum yield where fishing does not diminish the stock's ability to replenish itself continually. If too many fish are caught, the population can crash, as stocks are unable to reproduce sufficiently to maintain a sustainable level. Stocks in this situation are termed "overfished," a status determined by a scientific formula. Red snapper was first declared overfished in 1988, and NMFS found red snapper continued to be overfished each year since then until a 2015 stock assessment determined the stock was "no longer undergoing overfishing."[3] However, that statement may be word-play. The year before and the year after, NMFS declared that red snapper in the Gulf continued to be overfished. (79 Fed. Reg. 28686 (May 19, 2014), 81 Fed. Reg. 47357 (July 21, 2016).)



Because red snapper are overfished, NMFS is required by the MSA to limit harvests in order to rebuild the stock. In 1990 the first amendment to the FMP was adopted with the goal of reducing fishing mortality of reef fish in order to protect and rebuild those stocks. The amendment limited the exceptions to the size limit for red snapper, but NMFS rejected a proposal by an unidentified state marine fisheries commission to set a 2-fish recreational bag limit and a 1.4-m lb commercial quota in order to rebuild the stock. This could be considered a "marshmallow moment" in red snapper management. Instead of fishing less one year to fish more later, the FMP was expanded to allow a 7-fish bag limit and a 3.1-m lb commercial quota, acknowledging that those amounts "exceed the harvest level required to rebuild the red snapper stock, [but] that they are expected to check the rate of decline." (55 Fed. Reg. 2078, 2079 (Jan. 22, 1990).)

A year later, when the population had not rebounded, NMFS did not change the harvest levels, but changed the rebuilding date – extending it from 2000 to 2007. In 1991 the total allowable catch (TAC) was increased. In 1993 the commercial quota was increased by 50 percent and the rebuild date extended to 2009. In 1996 the rebuild date was extended to 2019. NMFS justified changing the target date that year rather than adjusting the TAC as follows: "The longer the stock recovery time, the less restrictive the TAC must be to ensure stock recovery." (61 Fed. Reg. 48641, 48642 (Sept. 16, 1996).) Arguably, such a statement violates both the word and spirit of MSA, which requires rebuilding terms to be "as short as possible" and "not exceed 10 years" except where social, economic, or environmental factors dictate otherwise. (16 U.S.C. § 1854(a)(2)(e).) NMFS' decision does not appear to have been challenged in court.

In 2005 the rebuild date again was changed to 2032, with NMFS acknowledging that it exceeded the MSA 10-year maximum, but pointing to harmful "social and economic impacts" if it employed greater reductions in reducing shrimp bycatch to rebuild more quickly. The Southern District Court of Texas saw things differently. Noting that "stock rebuilding plans must have a fair likelihood of succeeding," the court rejected this plan finding it was "inconsistent with the scientific data … and has less than a fifty percent chance of rebuilding red snapper stocks by 2032."[4]

In 2017 NMFS lowered the minimum stock size threshold (MSST) for red snapper. MSST is an objective standard establishing the quantity of fish needed for a sustainable stock based on the best available science. If stock is below the MSST, meaning the stock is incapable of producing the maximum sustainable yield on a continuing basis, it is considered overfished. NMFS' decision to lower MSST does not mean the quantity of red snapper in the Gulf has changed; it changes how NMFS interprets that quantity. The finding has the effect of allowing red snapper stock to "be reclassified as not overfished, but rebuilding," just a year after NMFS stated red snapper "continue to be overfished." It means that despite a quota overage in 2017, the 2018 quota will not be decreased because the stock is no longer overfished. In other words, it changes the rules of the marshmallow experiment.

Changes to Commercial Fishing

Commercial fishing of red snapper has experienced a sea change in the Gulf since the FMP was issued. For most of the 1990s, the red snapper FMP was amended to alter commercial activities more than recreational. There are approximately 1,020 federally licensed vessels that harvest reef fish, down from 1,200 vessels with red snapper permits in 2006. Unlike recreational fishing, commercial fish must be "landed" only at certain ports. This system allows NOAA to monitor commercial landings and halt fishing when quotas are met.

In 1990 the TAC for red snapper was based on historical landing data from 1979-1987. It allocated 51 percent of TAC to commercial fishing, which could occur year-round. This led to hastily closed fisheries when quotas were harvested more quickly than anticipated: an entire year's quota would be harvested within months.

NMFS tried closing the season early (1991, 1992, 1994, 1996), opening the season late (1993), or both (1995). But the efforts did not change the quick derby-like harvesting, resulting in very short seasons.

In response, NMFS established an individual transferable quota (ITQ) system in 1997. The ITQ system meant vessels with a valid red snapper permit as of August 29, 1995 could qualify to receive a "share" of the ITQ based on the average of its top two years' landings from 1990 – 1992. Coupons identified the share amounts held by a vessel (or its owner/captain/operator) and must be carried on board.

This program was revised to an individual fishing quota (IFQ) in 2007, again setting harvest shares based on landing history, from 1999 to 2004 (with one year dropped). In 2010 further changes to the IFQ program took effect, including an electronic reporting system for dealers, allowing for real time data on how many fish were caught. The program requires 3 to 12 hours advance notice of landings, including weight of catch, and place and time of landing. Sales can only be made to authorized dealers. In 2018 the value of those shares of red snapper was $500,366, according to NMFS.

In 2018 NMFS gave notice that it may take back non-activated IFQ shares from the 81 businesses that hold them. Instead of redistributing the shares to the remaining 669 active IFQ businesses, however, NMFS indicated it might keep them. Because those businesses had not acted to sell or transfer those shares, NMFS reasoned that taking those shares will not hurt those businesses and gave no indication that it would compensate for the withheld shares. It is possible that taking 81 shares out of commission could reduce the commercial share of red snapper below the 51 percent of the TAC set by the FMP.

Changes to Shrimp

Shrimp bycatch, the unintentional catching of red snapper while trying to catch shrimp, contributed to the decline of snapper stock. In the 1980s a burgeoning shrimping industry's nets scooped up the snapper small fry. However, the Gulf shrimp FMP was amended to require bycatch reduction devices (BRDs) in the late 1990s, and BRDs have dropped shrimp trawling bycatch markedly.[5] The shrimping industry sued, claiming it was bearing the brunt of rebuilding red snapper, when, instead, NMFS could lower the TAC.[6] The suit was dismissed on a procedural issue.

Changes to Recreational Fishing

According to NMFS, after it established the IFQ "there is no possibility of a quota overrun for the commercial sector." No such statement was made for the recreational sector. Over time, as the FMP failed to restore stock numbers, the Council and NMFS changed strategies for recreational fishing, switching from closing the season once quotas were hit to setting shorter seasons at the outset, and by reducing bag limits. The change happened gradually. The bag limit in 1984 was seven per person. In 1994 the bag limit was dropped to five. In 2013 it was two. Year-round seasons ended in 1997.

As mentioned above, recreational quotas were exceeded from 1991 to 2014, except for three years (twice involving seasons affected by an oil spill (2010) or a hurricane (2006)). Despite the overages during that time, the quota was decreased only twice: in 2007 and 2008. Looking at it another way, NMFS' response to the test subject eating the first marshmallow right away was to give it more marshmallows. In one notable example, NMFS set recreational quotas for 2012 and 2013, permitting an increase in 2013 only if the quota was not exceeded in 2012. A classic Stanford marshmallow experiment set-up. In 2013, following a 2012 recreational season where the recreational harvests exceeded the 3.959 m lbs quota by almost twice as much (a 3.565-m lbs excess), NMFS *increased* the recreational quota for the year.

And then NMFS re-opened the season in the fall of 2013 despite data that the 2013 quota already had been met. Commercial fishermen sued. To justify the decision to re-open the season, NMFS adopted the landings estimate it made *prior* to the season instead of relying on the actual landings data, calling the overage a sampling error. A federal court called NMFS' decision "egregious." The court remanded the relevant 2013 rules, saying NMFS "chose to adopt a landings estimate that it knew to be inaccurate, apparently to avoid punishing fishermen who might have been permitted to catch more under a hypothetical prior quota."[8]

In May 2015 the recreational quota (still 49 percent of the TAC) was modified, allocating the amount between for-hire and private sectors. The for-hire component (i.e. charter boats) was given 42.3 percent and the private sector 57.7 percent. Over the years, the ratio of for-hire vessels to private recreational boats had shifted. In 2004 55 percent of the reported recreational quota was landed by for-hire vessels.

In 2011 it was just 33 percent. The components have separate seasons, beginning in 2015. The Fifth Circuit Court of Appeals upheld the practice, following a lawsuit brought by recreational anglers who wanted more.[9]

The length of the season is tied to the quota, i.e. once a quota is reached, the season is closed. In August 2000, however, the recreational season was changed to April 21 – October 31 (194 days), instead of starting the season on January 1 and ending it whenever the quota was met. According to NMFS, "real-time data are not available soon enough … to determine the appropriate closure date and implement it in time to prevent quota overages." (65 Fed. Reg. 50158, 50160 (Aug. 17, 2000).) The season lengths were dictated in part by the requirement that NMFS must take into account red snapper stock harvests in state waters when determining when the recreational quota is reached, see 50 C.F.R. § 622.8(a). This led to some very short seasons, including a three-day season in 2017, which NMFS later retracted, instead allowing 39 days of fishing across the summer. NMFS was sued by the Environmental Defense Fund and others. The case is on hold pending the results of the 2018 season.

Federal Management

Federal management has been faulted for the increasingly shorter recreational seasons. The stock assessments have been disputed for either undercounting the stock or failing to divide the Gulf into separate management areas. Reefs are red snapper's habitat, either natural or manmade. Some claim NMFS' stock assessments failed to consider the numbers of red snapper around oil and gas wells in the Gulf. According to one source, however, manmade reefs account for less than one percent of available habitat in the Gulf for red snapper. Oil and gas platforms offer 12 km^2 of habitat compared to 1,578 km^2 of natural reefs (in the northern Gulf).[10] Moreover, NMFS indicates that instead of hiding populations, the reefs give the appearance of more abundance: "This characteristic for aggregating near locatable structures make[s] red snapper particularly vulnerable to exploitation, since fishermen targeting red snapper can maintain their catch rates even with reduced stock abundance."[11]

Additionally, some claim that the Gulf should be divided into eastern and western divisions with separate quotas. Following a 2007 stock assessment, NMFS rejected this idea: "The assessment found the eastern portion of the population to be in better condition than the western portion …. However, the red snapper population in both the eastern and western Gulf of Mexico is still considered overfished and undergoing overfishing." (73 Fed. Reg. 5117, 5118 (Jan. 29, 2008).)

State Management

A complicating factor is that the MSA applies only to federal waters – the EEZ. States manage fish in state waters. Until 2016 that gave Florida and Texas an edge in snapper activity, as their state waters extended nine nautical miles into the Gulf rather than three nautical miles for Alabama, Mississippi, and Louisiana. Under federal law effective in 2016, the seaward boundary of each coastal state in the Gulf of Mexico was extended to nine nautical miles for the purpose of managing reef fish. (Pub. L. No. 114-133.)

Rebuilding red snapper stock was problematic because as the FMP was amended to shrink seasons, sizes, and bag limits, states were allowing more and more fishing in state waters. NMFS tried to address the problem. In March 2013 it proposed a rule making the season "contingent upon the estimated landings from states with any inconsistent regulations. The more a state exceeds its apportionment of the annual quota, the greater the Federal season off that state is likely to be reduced to compensate for any quota overage." (78 Fed. Reg. 20292 (April 4, 2013).) A lawsuit was filed before the rule became final.[12] The court found NMFS' plan violated the MSA by discriminating against citizens of different states. In response, NMFS closed the entire Gulf recreational season on June 29, 2013, although it reopened it in the fall (see *Guindon v. Pritzker* above). In 2014 NMFS planned to end the recreational season on July 11, but in May issued an emergency rule setting a recreational fishing season of nine days. That year, 2014, is the only year since 1991 in which the recreational harvest was below the quota without a disaster in the Gulf.

In 2018, at the direction of Congress, each state government sets its own recreational season for red snapper in the Gulf of Mexico. A draft environmental impact statement is being prepared on the change, although NMFS issued exempted fishing permits (EFPs) to each state in April 2018. The program originates from the federal FY2017 Consolidated Appropriations Act, which, in part, authorized funding for "pilot programs for state-led fisheries management." (Pub. L. No. 115-141.)

The EFPs exempt states from complying with some regulations pertaining to recreational seasons. State authority is not unlimited, however. Notably, states do not get to set the quota, which NMFS set at 6.733 m lbs (2.848 m lbs for the for-hire sector, and 3,884,990 lbs for the private angling sector to be allocated per state). The 2-fish per person bag limit remains, and the minimum size is 16 inches. States established the season for recreational private anglers, while NMFS set the for-hire season for federally licensed vessels from June 1 to July 22.

The Council considered five alternate methods of how to allocate the percentages to each state based on historic landing data in its Decision Support Tool. The Council states that using historical data presents "high levels of uncertainty, especially for Mississippi," perhaps due to inaccurate reporting.[13] States whose anglers under-reported red snapper landings over the years will feel the effect as their future catch limits are based on those numbers. The allotments and details about each state's season are provided in the chart below:

State	Pounds	Percent	Season
Florida	1,778,515	45.78%	40 days: June 11 – July 21
Alabama	984,291	25.34%	47 days: Fri-Sun June – Labor Day, plus July 2-5
Mississippi	137,939	3.55%	101 days: starting May 25. Potential close dates of July 9-22, depending on landings by July 4
Louisiana	743,000	19.12%	Starts May 25 through Labor Day, Fri-Sun, plus federal holidays
Texas	241,245	6.21%	82 days: starting June 1
Total:	**3,884,990**	**100%**	

Conclusion

Three decades of managing fishing via delayed gratification – trying to limit harvests now with the promise of bigger harvests in the future – appear to have had little effect on recreational fishing quota overages. Even when quotas were increased, recreational anglers exceeded the limits. Recreational fishers who in 1991 were authorized to harvest just 1.96 m lbs with a 7-fish a day bag limit, but allowed to fish every day of the year, are now authorized to harvest 6.733 m lbs but with a 2-fish a day bag limit and only during the summer. NMFS set a large quota year after year in spite of the sector illegally exceeding limits almost every year while the fishery was being rebuilt.

Arguably, the recreational sector's behavior contributed to the continued postponement of a rebuilt stock in the Gulf, extending that goal from 2000 to 2032. In comparison, strict accountability measures in the commercial industry severely curtailed over-harvesting, and required shrimp BRDs cut bycatch by up to 50 percent. Thus, while red snapper management in the Gulf since 1984 appears to have brought the stock from the brink of collapse, it may be disputed whether that stock is close to being rebuilt or continues to be overfished. And the anglers who fish for the sheer pleasure of it may be the cause of the extended years of reduced stock.

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Endnotes

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4. Coastal Conservation Ass'n v. Gutierrez, 512 F. Supp. 2d 896, 900 (S.D. Texas 2007).
5. Benny J. Gallaway, *et al.*, "A Life History Review for Red Snapper in the Gulf of Mexico with an Evaluation of the Importance of Offshore Petroleum Platforms and other Artificial Reefs," Reviews in Fisheries Science, 17(1):48-67, p 54 (2009) (hereinafter "A Life History Review").
6. Texas Shrimp Ass'n v. Daley, 2000 WL 35938412 (N.D. Fla. April 12, 2000).
7. NMFS, Final Regulatory Amendment to the Reef Fish Fishery Management Plant to Set Total Allowable Catch for Red Snapper (Feb. 2010), p. 2.
8. Guidon v. Pritzker, 31 F. Supp. 3d 169, 195 (D.D.C. 2014).
9. Coastal Conservation Ass'n v. U.S. Dept. of Commerce, 846 F. 3d 99 (5th Cir. 2017).
10. Benny J. Gallaway, "A Life History Review" p. 54 (2009).
11. Regulatory Amendment to the Reef Fish Fishery Management Plan for Setting the 1991 Red Snapper Total Allowable Catch (March 1991), p. 8.
12. Texas v. Crabtree, 948 F. Supp. 2d 676 (S.D. Tex. 2013).
13. Gulf of Mexico Fishery Management Council.

The Great Red Snapper Count

Amanda E. Jefferson and J. Marcus Drymon

Red snapper (*Lutjanus campechanus*) is one of the most economically valuable and culturally relevant fisheries in the Gulf of Mexico. The earliest fishery for red snapper began in the eastern Gulf of Mexico in the 1840s. The fishery was originally centered close to shore, but as technology improved, the fleet expanded offshore and into the western Gulf. Over the next century, the fishery experienced periodic pulses of growth. Following World War II, advances in technology expanded the capabilities of the commercial fishery and recreational anglers sought increased fishing opportunities. Ultimately, the trends in fishing activity over the past 150 years have led to a depleted stock, which is now under a rebuilding plan. As the stock continues to show signs of recovery, anglers are seeing more (and larger) red snapper in the population; however, the spawning potential of the population (the number of reproductively active females) is still lower than the target required to rebuild the stock. The divergence between a population that is clearly rebuilding, and a stock that has not met its rebuilding target (the biomass needed for long-term sustainable yield), has led to widespread frustration among anglers. Hearing the frustration from their constituents, lawmakers took action.

In 2016 Congress made funding available to independently estimate the population size of Gulf of Mexico red snapper. Mississippi-Alabama Sea Grant awarded $10 million for a two-year project, which will run from 2017 – 2019. The project is known as the Great Red Snapper Count, and its goal is to estimate the absolute abundance of red snapper in the Gulf of Mexico. This evaluation will be conducted separately from the assessment process used by federal managers (National Oceanic and Atmospheric Administration (NOAA)). The project will be led by a well-integrated, multidisciplinary team of 21 investigators, which comprises leading fisheries experts from the Gulf region and beyond.[1] A suite of methods, including habitat classification, direct visual counts, depletion surveys, and a high-reward tagging study, will be used across the entire U.S. Gulf of Mexico.

The first phase of the Great Red Snapper Count involves habitat classification. Before scientists begin to collect fish abundance data, they must fully understand the distribution of the various habitat types present in the U.S. Gulf of Mexico. This region consists primarily of unconsolidated (sand/mud) sediment. Natural reefs are present but are relatively scarce. However, there are artificial structures in the northern Gulf of Mexico that serve as artificial habitat for several species of fish, such as red snapper. These artificial structures range in size and shape, from large oil and gas platforms common in the western Gulf to chicken transport cages, pyramids, and other smaller structures that are deliberately placed on the seafloor to attract reef fish. The coverage of the three general types of habitat (unconsolidated, natural, and artificial) varies dramatically within and among regions in the northern Gulf. By classifying habitat prior to sampling, scientists will learn how much sampling effort is needed at each of these habitat types to ensure that the study is rigorous.

Classifying habitat will be a multi-step process. To begin, the shelf waters of the northern Gulf will be separated into four regions: Texas, Louisiana, Mississippi/Alabama (between the Mississippi River and the Alabama/Florida state line), and Florida. Then, each region will be divided into three depth zones, creating 12 unique sections. Next, the habitats present in each section will be classified. Specifically, the amount of unknown/unconsolidated bottom habitat, the amount of natural reef habitat, and the number of existing artificial reef structures will be quantified.

Once the habitat has been classified, scientists will begin the sampling and data collection process. One component of the multi-faceted sampling approach involves direct visual counts of red snapper across the northern Gulf. This will be accomplished using two types of camera equipment. The first is a remotely operated vehicle (ROV), which is deployed from a stationary vessel and driven by an operator in a specific pattern, much like the operation of a remote-controlled car. The second is a towed camera array, which

is towed from a research vessel at a constant speed and consistent altitude above the seafloor along a predetermined path. Prior to this study, scientists tested both types of equipment. Specifically, they investigated sampling efficiency (i.e. the area sampled by the equipment), behavioral responses (i.e. changes in red snapper behavior because of the equipment), and detection probabilities (i.e. the chance that the equipment will detect red snapper). Based on the results of this pilot work, scientists decided that ROVs are best suited to sample artificial and natural habitats, while towed cameras are ideal for sampling large expanses of low-relief and unconsolidated bottom habitat.

After the ROV and towed camera data are collected in the field, it will be analyzed in the lab. The first step will involve counting the number of red snapper in each ROV and towed camera video. Then, these counts will be converted to red snapper density estimates. For locations sampled with an ROV, the density calculations will be based on reef area; for locations sampled with towed cameras, the density calculations will be based on the total area of seafloor viewed during each video.

Another approach for estimating the size of the Gulf of Mexico red snapper population involves depletion of the species by consecutive removals. At natural and artificial reef sites, this involves successive cycles of indexing (or counting) the population using ROV video footage, depleting the population (using hook-and-line gear), and indexing again. One cycle of this sampling procedure can be thought of as "index, removal, index." After at least one cycle is completed, scientists will compare the first "index" to the second "index"; the latter should be a reduction of the former, according to the amount of "removals." Since the number of red snapper removed from the population is a known quantity (determined during the "removal" component), scientists can convert the difference between the first and second "index" values to an absolute abundance estimate, which, in turn, will be used to estimate the population size. These techniques have been used with great success for terrestrial species like deer but are trickier to implement in marine environments.

Involving stakeholders in the research process increases buy-in of the resulting science and helps relieve tension between anglers and resource managers. One particular component of the Great Red Snapper Count will provide an ideal opportunity for stakeholder engagement in the scientific process. In 2016 Auburn University and the University of South Alabama initiated a high-reward tagging study of red snapper in the north-central Gulf of Mexico. The tagging study used during the Great Red Snapper Count will follow a similar approach, encouraging participation by rewarding recovery of high-reward tags on the fish.

During the spring of 2019, regional science teams will tag red snapper across the U.S. Gulf of Mexico. Scientific tagging of the fish is necessary to maintain consistency of the tagging procedures throughout the study. Tags will be placed in the back of the fish, just below the dorsal fin, and will carry a value of $250 apiece. Some fish will be double-tagged to estimate tag loss, and these fish will carry a value of $500 apiece. Throughout the 2019 federal red snapper season, anglers who catch and report the tagged fish get the reward. Scientists will rely on those tag returns as well as estimates of catch and harvest from participating anglers to create models to estimate Red Snapper abundance, exploitation, and movement patterns.

These methods implemented by fisheries experts across the U.S. Gulf of Mexico in the Great Red Snapper Count will provide an independent estimate (separate from the NOAA estimate) of red snapper abundance in the Gulf. Once analyses are complete, this project's estimate will be compared to the NOAA stock assessment results for Gulf of Mexico red snapper. In this way, the Great Red Snapper Count will provide insight into the Gulf of Mexico red snapper population, while also helping to calibrate the current stock assessment. Ultimately, this will lead to reduced stock assessment uncertainty, increased revenue to coastal communities, and maximum fishery access for stakeholders.

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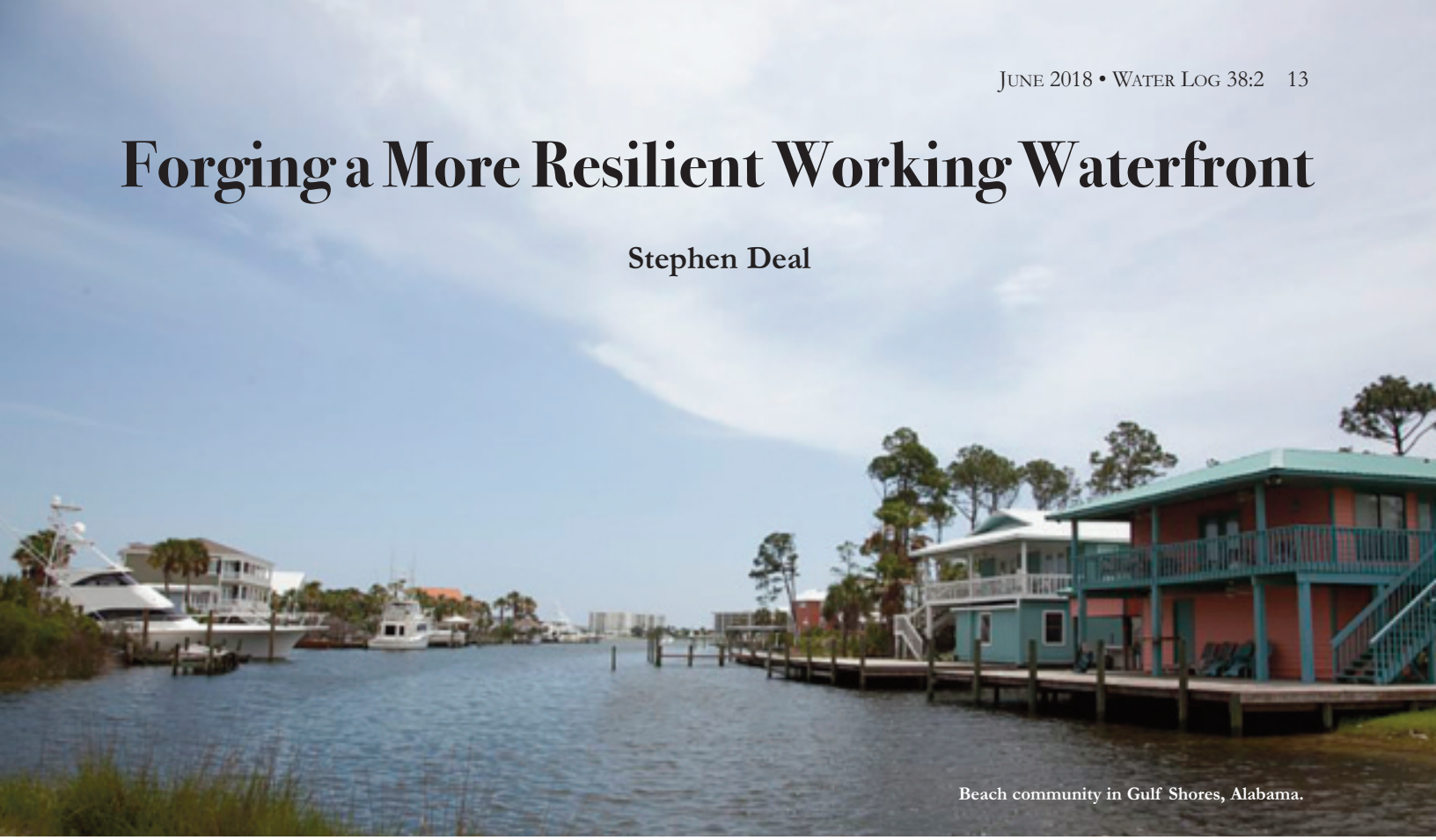
Endnotes

1. The Great Red Snapper Count team includes scientists from Texas A&M University, Corpus Christi; Texas A&M University, Galveston; Southern Methodist University; Louisiana State University; Louisiana Department of Wildlife & Fisheries; Mississippi State University; University of Southern Mississippi; Auburn University; University of South Alabama; University of Florida; University of South Florida; Florida International University; and Virginia Institute of Marine Science.

Forging a More Resilient Working Waterfront

Stephen Deal



Beach community in Gulf Shores, Alabama.

As real estate development increases within the nation's coastal communities as a result of tourism, it is easy to overlook the shrimping boats and other smaller fishing vessels that once defined life on the coast. While global shipping and seaport activity continues in America's major coastal cities, the large container ships and modern shipping operations sometimes are incompatible with the smaller fishing enterprises. This leaves the coastal planners caught among the pressures brought on by burgeoning coastal development, the continued expansion of seaports brought on by global trade demands, and the needs of more modest fishing operations. Working waterfront planning, including waterfront lands, waterfront infrastructure, and the waterways used for water-dependent activities, is the answer. By taking additional measures to outline and plan for the needs of private fisherman, seafood processors, and other working waterfront users, cities can support the local economy while assisting the small business owners who depend on the waterfront for a living.

Designate a Working Waterfront District

One component of good working waterfront planning is defining the scope and parameters of a city district that can suitably serve as a receiving area for new or existing working waterfront activities. Arguably the best regulatory vehicle that exists for this type of planning challenge is an overlay district. An overlay district, or zone, may be defined as a special zone figuratively placed over an existing zoning designation or a combination of zoning designations used for the same area.[1] These type of policy apparatuses are typically used in areas that have a strong, shared cultural identity, such as a historic district, or in places that are defined heavily by a unique activity or enterprise, such as the presence of an airport.

A prime example of using overlay districts to delineate and demarcate working waterfront activities occurs in the City of Gulf Shores, Alabama, where city officials, in conjunction with staff from Mississippi-Alabama Sea Grant, implemented a waterfront village overlay. The Waterfront Village overlay district encourages the growth of seafood processing and other traditional maritime uses while allowing other development compatible with mixed use. One concept employed has been a transect zone that is tailored to the unique circumstances of the neighborhood in question.[2] While a more conventional zoning code would focus primarily on suitable land uses and setbacks, a transect code goes one step further by governing specific aspects of the building's physical form, such as the range of housing types that can be

employed and how the building frontage is to be organized.[3] In Gulf Shores, the use of transect zoning allows the district to program different uses and development activities by setting five categories of land uses: waterfront commercial, neighborhood commercial, neighborhood general, green space, and special district. Although many of these categories are not uncommon in transect-based plans, what's notable in the Gulf Shores overlay plan is the presence of a waterfront commercial category.

The waterfront commercial category benefits seafood industry activities by explicitly carving out a space for waterfront commercial activities within the overlay's district land use regulating plan. Waterfront commercial activities would include many of the businesses and operations typically associated with existing working waterfronts such as boat hauling and repair facilities, seafood markets and commercial fishing facilities. Additionally, the urban pattern established by the zone, which includes ground level businesses with residential lodging and offices above, not only provides a strong foundation for mixed-use development to thrive, but will also allow the community to grow in a way that doesn't overwhelm the commercial activities of local fishermen.

Another positive feature of the overlay zone is that it makes water access a use that is allowable by right. This means that potential developers and business owners are not subject to special review and approval by the city of Gulf Shores if they wish to undertake improvements that expand waterfront access to the general public. Such a measure helps expedite the development review process and also functions as an incentive for private businesses to invest in waterfront access points. This level of policy guidance and detail to the waterway village concept is due, in large part, to the overlay district concept, which allows for a greater level of guidance and precision than what is authorized under the basic city zoning code. By implementing an overlay, Gulf Shores not only tailors its zoning categories to meet the demands of a specific district, but it can also provide directives on how the district is to perform and be phased-in as well.

Building Support Capacity for Local Seafood

Once a suitable planning method has been found for working waterfront development, the challenge shifts from being a land use planning question to more of an economic development question: how does the city build additional support capacity for local seafood processors and fishermen? A zoning plan can sort and distribute real estate value and signal to developers locations where the city will encourage new investment. But zoning by itself can't create value where it doesn't already exist. To build a critical mass of activity in an economic sector, even one with as rich of a history as seafood production, a city needs to be willing to make concrete investments in its infrastructure and workforce in order to attain a threshold or tipping point where an industry can regularly sustain itself over time. A great example of building economic value within the seafood industry occurs in coastal Louisiana, where the Twin Parish Port District, which governs the port for the small town of Delcambre, has taken many notable strides in supporting its seafood processing industry.

The Twin Parish Port District, working through the port of Delcambre, has been actively engaged in improving the marketing and publicity for the local catch. One notable effort that communities could learn from is its Delcambre Direct initiative. Delcambre Direct is an online sales program, which allows seafood customers to place shrimp orders online.[4] After the first shrimper successfully used the Delcambre Direct program, within 30 days almost every boat at the port of Delcambre started using it. The program also helped eliminate some of the more time-consuming tasks associated with seafood marketing. One shrimper noted that before the program was in place she had to call customers to notify them about the availability of shrimp; now that is no longer needed.

Digital connectivity is only one small component of the support services provided at the port of Delcambre to local seafood providers. Physical proximity still has its advantages, which is why local leaders put considerable time and effort into creating a seafood market. In 2011, the United States Department of Agriculture awarded an $80,000 grant for the purpose of opening a seafood and farmers market at the port of Delcambre.[5] In 2014 a new boat launch that can hold up to four boats was built, along with a new 7,500-square foot pavilion where local shrimpers can directly sell their catch to the public.[6] These investments have paid real dividends in encouraging the general public to buy more local seafood. In the year 2014, for example, it was estimated that more than 4,000 people attended the first seafood and farmer's market of the season.

The advantages of a physical seafood market are considerable for shrimpers due to the nature of the industry, as the Port Director for the Twin Parish Port Commission

noted, "a shrimp boat is not designed to sell retail."[7] Because a shrimp boat is designed to offload bulk, most shrimpers generally sell their catch to wholesalers, and since wholesalers have to compete with imports, the prices aren't the best, which depresses the shrimpers' bottom line. By comparison, when shrimpers are able to sell directly to consumers they are able to fetch a much higher price. By understanding the economic dynamics of their local seafood market, the port of Delcambre has been able to devise a support structure that helps their local seafood producers thrive. The success of a region's working waterfronts is contingent upon local communities taking an active role in the continued success of commercial fishing, and here in the Northern Gulf of Mexico the work performed at the port of Delcambre is a prime example of what that success can look like.

Conclusion

Maintaining the traditional maritime industries of the Gulf Coast can be achieved. The first strategy is to define a working waterfront zone in the municipal codes and regulations, whether it is an existing one or something that has to be created from whole cloth. Defining a district is simply the foundation though. Once a district has been conceived it is necessary to build support capacity. This capacity may be physical, such as a newly constructed seafood market to engage in the direct sale of commercial catch, or it can be organizational, like a joint marketing campaign to encourage local seafood consumption. This type of built-in support model is critical to receiving local buy-in. With these pillars in place it becomes possible to keep working waterfronts and carve out a place for the fishermen and seafood processors who help make coastal living possible.

Stephen Deal is the Extension Specialist in Land Use Planning for the Mississippi-Alabama Sea Grant Legal Program.

Endnotes

1. Elizabeth Garvin, *Making Use of Overlay Zones*, July 15, 2001, PlannersWeb.
2. City of Gulf Shores, *Zoning Ordinance for the City of Gulf Shores*, May, 27 2017.
3. Opticos Design, Inc. *How to Regulate – Missing Middle Housing*, 2018, Missing Middle.
4. Bruce Schultz, *Online Program helps shrimpers reach customers*, April 11, 2013, Louisiana Sea Grant.
5. Port of Delcambre, *USDA Funds Delcambre Seafood & Farmers Market*, April 2013, PortofDelcambre.com.
6. Associated Press, *Delcambre welcomes new boat launch, pavilion*, Sept. 12, 2014, Daily Advertiser.
7. Ashely Hinson, *Shrimp go from boat to public*, June 2, 2015, The Daily Iberian.

In Sum.

A Summation of the Facts and Figures of Interest in this Edition

★ *Red snapper's rank in Gulf commercial seafood species by value:*	9
★ *Businesses that don't use their shares of the commercial red snapper quota:*	81/750
★ *Allowed catch by recreational sector of red snapper from 1991 – 2014:*	87.533 m lbs
★ *Actual catch by recreational catch of red snapper from 1991 – 2014:*	132.02 m lbs
★ *Highest value of tagged red snapper in Great Red Snapper Count:*	$500

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