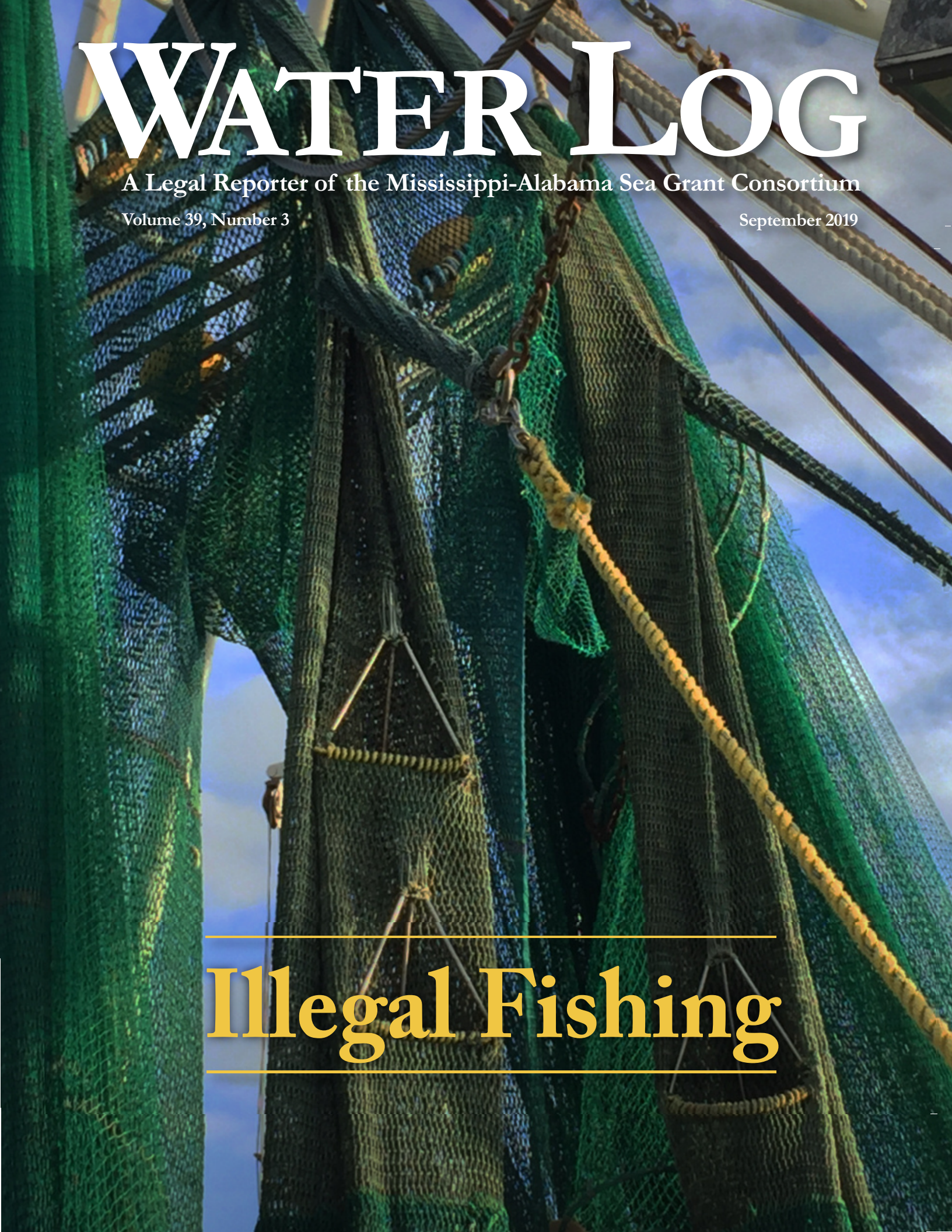

WATER LOG

A Legal Reporter of the Mississippi-Alabama Sea Grant Consortium

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Illegal Fishing

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Cover photograph: Shrimp trawls with TEDs and BRDs
Credit: Ryan Bradley

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10th Symposium on Harmful Algae in the U.S.

Nov. 3 – 7, 2019

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The Laws and Lawlessness that Make Up Illegal Fishing

Kristina Alexander

In 2018 a Russian-named vessel sailing under a Togo flag was chased from Africa to Indonesia at first by the Tanzania navy and then by an environmental group.[1] On board were Russian officers, believed to be linked to organized crime, 18 miles of gill nets, and a crew deemed to be enslaved. The vessel had been tracked by international authorities for 10 years, trying to prevent its illegal fishing reportedly worth $50 million.

Illegal Fishing — U.S. and Internationally

Illegal fishing in the United States can mean a lot of things – fishing without a permit; using the wrong gear; fishing at the wrong time of year – leading to a slap on the wrist or a fine. But considered internationally, illegal fishing has big consequences. According to the United Nations (UN), illegal, unreported, and unregulated (IUU) fishing is "one of the greatest threats to marine ecosystems" because it threatens sustainability of fisheries as well as marine diversity.[2] These operations use large vessels to trawl the oceans, many from Asian countries. Additionally, The New York Times has reported slavery on board some ships, where men are kept on board for years.[3] According to the UN, approximately one in every five fish caught worldwide originates from IUU fishing.[4] With that many fish being harvested by crews unmindful of sustainability or catch methods, the results could be catastrophic to the environment, perhaps collapsing certain stocks.

The categories of IUU are explained by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) as follows:

- *Illegal* means fishing that is conducted contrary to laws, rules, and regulations;
- *Unreported* refers to fishing that is not reported to the appropriate authorities in terms of size, location, method, or type of catch;
- *Unregulated* means fishing in an area where there are no conservation measures in place, or where the vessel is in an area managed by a regional fisheries management organization, but the vessel is not a member of that organization and/or is acting contrary to the conservation measures of that organization.[5]

According to NOAA when explaining IUU fishing, "Developing countries that depend on fisheries for food security and export income are most at risk from IUU fishing. For example, total catches in West Africa are estimated to be 40 percent higher than reported catches." Thus, one problem caused by IUU fishing is that smaller operations, such as family-owned boats, have to work harder and travel farther to gather a decent catch after the large illegal fishing vessels overharvest their fisheries. Additionally, IUU fishing can lead to false identification of fish, leading to lower quality fish in the market and driving down the price of legally harvested fish.

Lanchas in the EEZ

The stakes are just as high even when the illegal vessels are small. For example, illegal red snapper fishing by foreign vessels in the Gulf of Mexico is a problem. Legal fishing is being adversely affected by fast moving, easily built vessels, known as a lancha, from Mexico. Red snapper stocks are teetering on the edge of overfishing, and recreational and commercial catch limits are strictly limited by regulation. For example, two years ago, the agency that established fishing quotas, NOAA Fisheries, set the recreational red snapper fishing season for just

three days, from June 1 to June 4 of 2017.[6] Accordingly, having any non-permitted fishing takes a toll on the available red snapper.

However, this type of IUU fishing is a very different type of operation from the big vessels that sweep the oceans with miles of nets. Lanchas – low-freeboard open boats of about 20 feet with outboard motors – are small vessels carrying a few men. Because they are shallow skiffs, they can be pulled ashore easily, not requiring ramps or lifts, and can be launched easily as well. They are made of fiberglass, making them invisible to radar. And they are fast.

The U.S. Coast Guard intercepts these boats in the Gulf of Mexico when it can find them. According to data obtained by the author from the U.S. Coast Guard's 8th District, the Coast Guard has stopped and seized (known as interdiction) 234 lanchas from January 1, 2015 to June 19, 2019, in the U.S. exclusive economic zone (EEZ) of the Gulf of Mexico. (The EEZ begins where state waters end. Off the coast of Texas, that occurs at 9 nautical miles, or roughly 10 land miles from shore.) The Coast Guard seized 26,159 pounds of fish in 2018 from these boats, a remarkable thing considering it interdicted just 60 boats. Red snapper accounted for 10,875 pounds of that contraband. This means those 20-foot boats with 3-person crews and equipment are carrying an average of 435 pounds of fish per lancha. And they are motoring those overfilled vessels more than ten miles out to sea. Granted, the U.S. recreational red snapper private catch total for 2018 was 5.386 million pounds, making the illegal fishing haul less than one percent of that total. However, that amount tallies only the poundage seized by the Coast Guard. During those same years, the Coast Guard reports spotting 552 lanchas, and not all of those were interdicted.

In the case of lanchas in the U.S. EEZ, also known as federal waters, application of U.S. law is clear: the Magnuson-Stevens Fishery Conservation and Management Act (MSA) claims "exclusive fishery management authority" for the United States over all fish and fish resources within the EEZ.[7] Under the MSA, no foreign fishing is allowed in the EEZ unless authorized and conducted under a permit. The permit requirement is a bit of a catch-22 as Congress prohibits NOAA from permitting foreign fishing except for that amount of fish "which cannot, or will not be harvested by vessels of the United States." As there is no surplus red snapper, the lancha operators would not be able to receive a permit even if they applied.

Magnuson-Stevens Act and Illegal Fishing

The MSA also addresses fishing on the high seas, or international waters. When it comes to international waters, no country has jurisdiction and law enforcement is voluntary, meaning a law is enforceable only upon countries that agree to submit to it. This is signified by entering treaties. Enforcement is a problem with treaties, however. Treaties can be self-enforcing (meaning a country that violates the treaty must turn itself in and/or punish its citizens who offend) and custom tailored (meaning treaties bind the member countries only to the extent they agree to be bound). For example, under the International Convention for the Regulation of Whaling, its 89 member countries agree to follow certain rules on harvesting whales, such as no commercial whaling. The treaty provides for self-monitoring if this rule is broken. Thus, each country enforces the law against its own citizens but not against other countries. Also, the treaty allows members that do not agree with a treaty provision to enter a "reservation," allowing that country to act without legal consequences. For example, the whaling treaty bans commercial whaling, but countries can enter into a reservation allowing them to hunt commercially without being in violation of the treaty. Similar international treaties are in place for Atlantic tuna, North Atlantic salmon, Pacific salmon, and Western and Central Pacific fisheries, for example.

The MSA was amended to enforce the United States' IUU international treaty obligations regarding driftnets. Driftnets are massive nets – sometimes 50 miles long – that are not anchored. They are harmful to the ecosystem because of the large amount of bycatch, or unintended wildlife, captured by the net. According to one source, 7.3 million tons of animals are killed annually as bycatch in driftnets.[8] The United Nations banned driftnets longer than 1.5 miles in 1993. The MSA does not authorize active enforcement against ships caught using illegal driftnets, however. Instead, the law requires NOAA to identify countries with vessels conducting IUU fishing, and report those countries to Congress, the President

and the offending nation. In other words, the IUU fishing is not stopped at the time of its discovery.

International Port State Treaty

A recent international treaty allows more active enforcement. The Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (or the Port State Measures Agreement, PSMA) tries to address IUU fishing by authorizing member states to act when ships come in to port, preventing the illegally harvested fish from entering markets. The treaty applies to foreign fishing vessels operated for profit once that vessel seeks permission to enter a member country's port. Smaller vessels that fish for subsistence quantities are exempt. The PSMA entered into force on June 5, 2016. A port country that is a signatory to the treaty – 61 countries are parties – has the authority to prevent the ship from docking, or offloading its cargo (except in exigent circumstances).

More particularly, under the treaty, when a member country has "sufficient proof" of IUU fishing, it can deny a vessel entry into its ports. And, under Article 11 of the PSMA, once a vessel has entered port, the member country can deny that vessel "the use of the port for landing, transshipping, packing and processing of fish." Additionally, if the member state has "clear evidence" that the fish on board were taken in violation of law, the member state may also deny that vessel refueling, resupply, and maintenance. These restrictions do not apply in the case of the health and safety of the crew or the safety of the boat.

The treaty allows disputes regarding IUU fishing to be taken to the International Court of Justice, meaning enforcement can be meted out by an independent party. Compare that to the driftnet treaty where the most action allowed by statute is reporting the offenses. However, while the PSMA describes specific obligations of member countries, the United States does not have legislation in place to enact the treaty, meaning Congress has not delegated the actual U.S. enforcement duties to specific federal agencies.

Other Methods to Track IUU Fishing

The UN has developed an additional process to help identify and track IUU vessels. The Global Record is a list of fishing vessels, refrigerated transport vessels, and supply vessels, allowing port states to check for valid, law-abiding ships. As part of that process, and under a separate treaty, a number is assigned to fishing vessels of 100 gross tonnage or more, known as an International Maritime Organization (IMO) Number. Smaller craft down to 12-meters long that are authorized to operate on the high seas also must have an IMO number. That number stays with the vessel for its entire life, even if there are changes of flag, ownership, or name. According to the UN, there is an effort to make the IMO Number compulsory for vessels in member states' fisheries.

Tracking vessels for their lifetime may make apprehension of IUU criminals easier but not a sure thing. In the case of the Russian-named vessel mentioned above, for example, the vessel provided a false IMO after being chased around the world claiming flags of at least eight nations.[9] Radar images of the vessel were used to link the ship to the electronic tracking identification system it had spoofed, showing it was in the Falkland Islands, Fiji, and Norway, all at once. The 10-year chase of that ship illustrates how hard it is to enforce the law against the lawless.

Kristina Alexander is the Editor of Water Log *and a Senior Research Counsel at the Mississippi-Alabama Sea Grant Legal Program at the University of Mississippi School of Law.*

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A Fisheye Perspective on Bycatch Reduction Devices in the Gulf of Mexico Shrimp Fishery

Ryan Bradley


Credit: Mark Kopzywa

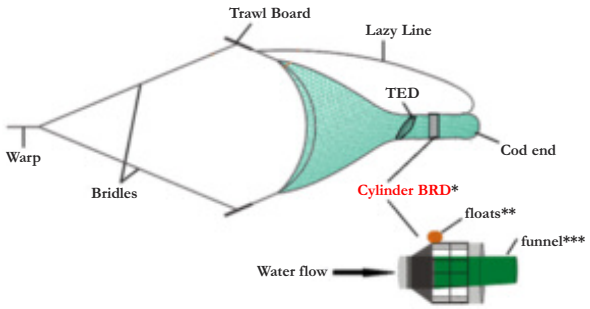
Red Snapper has been the most fought over fish in the Gulf of Mexico for well over the last decade. An iconic fish that was once on the verge of collapse now enjoys a triumphant return. Along with the increase in abundance of red snapper comes an increase in controversy as user groups fight over allocation.

Bycatch Reduction Devices for Shrimpers

Behind the rebuilding of the famed red snapper is a series of obscure management measures within the Gulf of Mexico shrimp fishery involving bycatch reduction devices (BRDs) that helped paved the way for the return of the most sought-after finfish. A recent publication indicated that bycatch mortality of red snapper in shrimp trawls comprised about 4% of the total juvenile mortality, much less than previously believed.[1] While shrimp trawl mortality is clearly not the "driver" of Gulf of Mexico red snapper population losses as was previously estimated, the BRDs contributions to marine conservation should not go unacknowledged in the red snapper debate. We must not preclude the efforts of the Gulf shrimp industry to help this most sought after species recover.

Federal regulations mandated the use of specific BRDs in the western Gulf of Mexico shrimp fishery beginning in May 1998. The two BRDs certified for use were the midsize "fisheye" BRD in the 30-mesh position and the extended funnel BRD. The midsize fisheye BRD reduced shrimp trawl bycatch mortality by 58%. Two states have made the use of BRDs in state territorial waters mandatory as well: Texas and Florida.

Credit: Glenn Parsons



* Please note that the BRD should be sewn into the net between the TED extension and the cod end (bag) with the floats** on the top of the BRD. The tail end of the funnel*** should be attached to the top of the inside of the bag with a couple of zip ties or with twine.

A diagram of a Cylinder BRD

Turtle Excluder Devices for Shrimpers

The contributions of the U.S. Gulf of Mexico shrimp fishery towards the conservation of marine ecosystems has been tremendous due to the use of BRDs. However, the widespread use of BRDs in the shrimp trawl fishery was not the first major mandated conservation effort handed down to the shrimp fishery. Previously, in 1987 federal regulations mandated the use of turtle excluder devices also known as TEDs. These TEDs not only help shrimp trawls safely and passively release sea turtles, they have proven effective at reducing bycatch of larger species of finfish, sharks and rays.

Turtle Excluder Devices consist of a metal tubular frame with grates or bars that are spaced 3-4 inches apart to prevent sea turtles from entering the cod end of a shrimp trawl. If a sea turtle is caught in a shrimp trawl, the TED acts as a passive release device allowing the sea turtle to swim freely through a moderately size escape hole adjacent to the TED frame. Otter trawl shrimp vessels are required to use TEDs in both state and federal waters. Skimmer trawl shrimp vessels are exempt from the TED regulation due to their unique mode of operation but skimmer trawls vessels are required to limit tow times to less than 55 minutes in summer months and 75 minutes in winter months to limit turtle bycatch. The American shrimp industry has contributed to the rebuilding of sea turtle populations and nesting sites in part to these conservation measures in place for nearly the past three decades.

Development of BRDs

Researchers from Mississippi-Alabama Sea Grant Consortium (MASGC) paved the way for the use of the BRD and the subsequent recovery of red snapper. Nearly two decades ago, MASGC researcher Dr. Dave Burrage of Mississippi State University led a study on a promising new bycatch reduction device dubbed the "fisheye." It was an inexpensive triangular metal frame with a football shaped hole that could be easily sewn into the cod end of any shrimp net. This device, after months of arduous testing was proven to work efficiently at releasing juvenile finfish, including red snapper, captured in shrimp trawls while allowing very minimal shrimp loss. The concept is simple: as the catch enters the net, shrimp are forced to the cod end of the net while the stronger swimming finfish are able to swim freely forward out the escape hole(s) in the BRD.

Dave Burrage with BRD

This innovative bycatch reduction devices didn't make its way into being a mandatory NOAA requirement overnight. Researchers worked tirelessly to bring the idea to fruition. Dr. Burrage spent weeks out on our family owned shrimp boat testing out the BRD's effectiveness by moving it up and down throughout the cod end of the net, counting every shrimp and bycatch that came on board. Dr. Burrage not only spent weeks at sea on our boat, he also spent weeks at sea on several other shrimpers' boats as well. Eventually we figured out just the right location to place the BRD so that we had optimal fish reduction with minimal shrimp loss.

Dr. Burrage's study help provides the best available science to guide management and regulatory decisions. Now, the BRDs are widely used across the Gulf and most fishermen never even want to take it out. Many inshore shrimp fishermen use BRDs in state waters because the industry recognizes the efficiency and conservation benefits of doing so even though states like Mississippi, Louisiana, and Alabama do not mandate their use. A survey conducted in 2017 by Mississippi Commercial Fisheries United and the Audubon Nature Institute's Gulf United for Lasting Fisheries (G.U.L.F.) Program revealed that nearly 89% of shrimpers surveyed indicated that they already use BRDs voluntarily.

Credit: Ryan Bradley

BRD Innovations

Innovations in bycatch reduction in the shrimp trawl fishery have not stopped here. In fact, many shrimpers use more than one BRD per net, releasing much more bycatch than originally thought was possible. Additionally, researcher Dr. Glenn Parsons with the University of Mississippi has been working for several years to improve the efficiency of the extended funnel BRD by developing and testing new prototypes in cooperation with the shrimp industry. He has received numerous grants to design, modify, and test new designs. The shrimp industry has worked cooperatively with Dr. Parsons and other researchers to advance the sustainability of the shrimp industry which has becoming increasingly important as the Gulf shrimp industry leans toward independent, third-party sustainability certification of the entire fishery.

Much of the work done to advance the use of BRDs and the sustainability of our nation's marine resources has been facilitated by the National Sea Grant Program – an invaluable asset to the United States. The program is tasked with a variety of marine research, development of cutting-edge technologies, and transfer of these technologies from universities to industry. Just as in the case of the bycatch reduction device, Sea Grant programs all across the nation are paying dividends on the future sustainability of marine resources for decades to come. Regardless of what state you live in or seafood preference, we can all appreciate the great work that the National Sea Grant Program produces. Together, working cooperatively with industry and academia we can yield results that empower our fishermen and enhance the resources we all enjoy.

Ryan Bradley is the Executive Director of Mississippi Commercial Fisheries United, Chairman of the Mississippi-Alabama Sea Grant Advisory Council, a fifth-generation commercial fisherman in Mississippi, and founder of Sea Alis Seafood Company out of Long Beach, MS. The Mississippi Commercial Fisheries United, Inc. (MSCFU) is a non-profit serving to protect the common interests of Mississippi's commercial fishing industry, promote sustainable fisheries through leadership in stewardship, and advocate on behalf of commercial fishermen, fishing businesses and consumers of the resources our industry provides. It was originally established as the Mississippi Gulf Coast Fisherman's Organization, Inc. in 1974. To learn more about Mississippi Commercial Fisheries United visit www.MSCFU.org.

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Protecting the Dusky Shark Starts with Accurate Bycatch Reporting

Strider Kachelein

Photograph: Richard Ling

Introduction

The dusky shark lives in warm coastal waters from the Gulf of Mexico, to the Brazilian coast, over to Africa, and even to Australian and Japanese shores. Most recently, however, it made an appearance in court. This shark is 12 feet long, weighs 400 pounds, and grows slowly, taking up to 20 years or longer to mature. In U.S. waters, it travels from the coast of Massachusetts to the border of Texas and Mexico, making it a highly migratory species (HMS). Despite its size and range, the dusky shark has faced population decline for many years. In the 20th century, fishers once caught them commercially, partly for their valuable fins. Today, longline fishing for other species unintentionally plays a role in their decline. In longline fishing, boats tow a line up to 40 miles long, dotted with hooks. Fishers do not intend to catch dusky sharks, but by luring snapper, grouper and other fish, they also hook dusky sharks that try to steal bait. The sharks are tossed back into the water where, if not already dead, they often die shortly thereafter.

Bycatch is the term for all animals, like dusky sharks, that fishers accidentally catch but do not want or are not allowed to keep. This includes not only fish but also the 720,000 birds and 650,000 marine mammals (like whales, dolphins, and seals) that die each year as bycatch.[1] As these figures suggest, bycatch is a problem for both fishers and marine ecosystems. For example, in 2015 shrimp trawlers in the Gulf caught 250 million pounds of bycatch of fish

for just 125 million pounds of shrimp.[2] Globally, one study conservatively estimated that every year fisheries discarded 38.5 million tons of bycatch, which equaled 40% of total landings.[3] These deaths from bycatch can imperil a population.

Legal Background

In order to protect species like the dusky shark, the government can regulate where, when, how, and how many a fisher can catch. Specifically, the National Marine Fisheries Service (NMFS), a part of the National Oceanic and Atmospheric Administration (NOAA), approves fishery management plans (FMPs) that address these issues. These plans establish accountability measures by regulation aimed at conserving species. These measures vary based on bycatch data. Where data show a lot of bycatch, NMFS can change fishing practices to help the species.

Recently, the environmental organization Oceana sued NMFS, which issued a dusky shark FMP in 2017. Oceana had two main arguments: first, NMFS used inaccurate bycatch data, and second, NMFS did not do enough to protect the dusky shark. This past March, the federal district court for the District of Columbia ruled for Oceana.[4] It found that NMFS ignored certain bycatch data, resulting in an inaccurate FMP. As a result, NMFS must now reanalyze the FMP's protective measures aimed at helping the dusky shark.

This was not the first time NMFS tried protecting the dusky shark. In 2000, it banned catching or possessing dusky sharks as part of an FMP that applied to all highly migratory species. The FMP classified the dusky shark as a prohibited species, meaning that fishers were not allowed to catch one and had to pay increased penalties if they did so. Anyone guilty of a prohibited act, like catching a dusky shark, may have to pay a civil penalty.[5] The penalty amounts depend on the size of the offense; a regional penalty schedule is set for breaking regulations,[6] and for larger violations, NOAA uses a national schedule to determine an appropriate penalty based on the defendant's culpability and violation history.[7] Accordingly, possessing a dusky shark, and not just accidentally catching and releasing one, can result in a written warning and up to a $24,000 fine, depending on the number of dusky sharks caught and if they were intentionally caught. If fishers target dusky sharks specifically for fins, this fine could increase to $72,000.

In 2006, NMFS conducted a stock assessment and found that simply prohibiting possession of the dusky shark did not help increase its numbers. Bycatch still reduced populations. In 2011, a new stock assessment showed that the dusky shark's population shrank by 80% from 1960 counts, according to the court in the Oceana case. As a result, NMFS revised the HMS FMP, with an entire section focused on the dusky shark.

Every FMP must follow the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and abide by the ten National Standards set forth within the act. Of great importance to the dusky shark is National Standard 2, which requires that all FMPs use "the best scientific information available."[8] Oceana's first argument against NMFS focused on this standard. According to Oceana, NMFS did not use the best scientific information available, primarily in how it calculated bycatch amounts.

Bycatch Reporting

NMFS records bycatch with two main types of data: observer and logbook. For observer data, NMFS employees stand aboard fishing boats and report bycatch by weight and species. These observers receive training and sometimes have additional duties such as monitoring gear or safety equipment. It is expensive for NOAA to employ observers, however, which limits how many are used. For logbook data, fishers themselves record values into logbooks and report this back to NMFS. This is inexpensive and widespread, but fishers might misreport numbers or misidentify species. Fishers must maintain accurate reports and not obstruct observers in order to avoid fines. Penalties for submitting inaccurate data can vary. Under the national schedule, a fisher may be cited for unintentional reporting errors, while intentionally falsifying information can result in a $48,000 fine. While both methods of data gathering should in theory yield similar results, observer and logbook data for the dusky shark differ greatly.

Fishers accidentally catch dusky sharks in both non-HMS and HMS fisheries. In non-HMS Gulf fisheries, such as snapper and grouper, observers were on 5%-10% of boats, according to the *Oceana* court. They recorded dusky shark bycatch "in the single digits." The court contrasted this with logbook data, which covered about 20% of boats but showed 3,800 dusky sharks in bycatch per year. Thus, manually recorded logbook data showed

many more dusky sharks caught as bycatch per boat than when observers were on board – essentially less than one shark caught per percent of boats when observers were on board, versus 190 sharks per percent of boats when logbooks were used. A definitive explanation for this difference does not exist; however, it could be attributed to fishers acting differently when observers are onboard, and/or fishers misidentifying species in logbook data.

The disparity also occurred in HMS fisheries. For HMS fisheries where boats target tuna, swordfish, billfish, and non-threatened shark species like the Atlantic sharpnose shark, the court noted how observers were on 5%-10% of boats and recorded 32 dusky sharks in bycatch per year. The court contrasted this with logbook data, which covered 100% of boats and showed 550 dusky sharks in bycatch per year. Although the difference was not as significant as for non-HMS fisheries, logbook data for HMS fisheries still showed potentially hundreds more dusky sharks in bycatch than what observer data indicated. Despite the great disparity between observed bycatch and logged bycatch, when deciding how to protect the dusky shark, NMFS considered almost exclusively observer data. Oceana argued that NMFS did not use "the best scientific information available" by ignoring the logbook data.

In the past, NMFS did use logbook data to calculate bycatch. Because the agency stopped using that method in 2017, the court pointed out a "sharp break from past practice" saying NMFS "has essentially done a one-eighty on the issue."[9] NMFS argued that it left out the non-HMS Gulf logbook data because that information was from only 20% of boats, which is small coverage. The court found this argument unconvincing because NMFS relied instead on the observer data, which had even smaller coverage of just 5%-10% of fishing vessels. Additionally, the court wondered why NMFS used these figures as if they represented every dusky shark caught instead of using them to estimate dusky shark bycatch for the other 90%-95% of boats not being observed. Without a reasonable explanation why it left out logbook data, according to the court, NMFS should have used that information to either supplement observer data's small vessel coverage or to estimate more accurate findings. Consequently, the court ruled that the dusky shark's FMP did not use the best scientific information available. Because the FMP was inadequate, NMFS also had to reanalyze its measures aimed at protecting the dusky shark.

Accountability Measures

Oceana's second argument focused on NMFS not doing enough to protect the dusky shark in both HMS and non-HMS fisheries. The MSA authorizes NMFS to regulate highly migratory and non-highly migratory fisheries differently.

For HMS fisheries only, NMFS' accountability measures, or changes in fishing practices, included requiring that fishers learn proper dusky shark identification and safe handling when unhooking and releasing. They also included increasing communication among boats so that fishers would not catch in areas with a lot of dusky sharks present. Fishers also needed to use circle hooks. These hooks curve inward and reduce deaths by hooking onto a shark's mouth instead of going deeper and possibly puncturing organs like the common J hooks can. In the Gulf of Mexico, not using circle hooks when required can result in a $250 fine for the first offense and $500 thereafter if a small infraction. If a more serious violation, then the national schedule for fishing with non-compliant gear authorizes fines of $2,500 to $48,000, with a possible $120,000 fine if fishers do not minimize catching prohibited species like the dusky shark.

NMFS published these specific regulations only for HMS fisheries, however. For non-HMS fisheries, NMFS did not impose additional requirements for dusky shark protection because the observer data showed such small numbers of bycatch. Instead, NMFS found it enough that the dusky shark was already a prohibited species with a catch limit of zero. A zero catch limit means that no dusky sharks may be caught in a season. Fishers who exceed individual catch limits can sometimes pay up to a $48,000 fine. If the fishery as a whole exceeds its catch limit, then NMFS can reduce the next year's limit by the amount overfished or just close the fishery. For the dusky shark, Oceana reasoned that if just one shark were found in bycatch, then this would exceed the annual catch limit. Therefore, Oceana argued that NMFS had to issue measures that ensured that no dusky sharks were caught, even if accidentally, in a season.

The court disagreed with Oceana. It cited an MSA provision instructing that NMFS does not need any new measures "if only small amounts of [bycatch] occur" and the annual catch limit is already zero. The dusky shark's catch limit was already zero, and for non-HMS fisheries, NMFS' observer data showed small amounts of bycatch

("in the single digits"). Accordingly, the court held that under the MSA, NMFS did not need additional measures for non-HMS fisheries. However, the court already decided that NMFS did not base these measures on the best scientific information available. Therefore, even though additional measures were not required, NMFS must reanalyze its existing accountability measures after properly considering all the available data.

Conclusion

Preserving dusky sharks is not easy, partly because estimating and recording bycatch is difficult. Dusky shark populations continue to decline despite past attempts to protect them; therefore, continued and increased conservation measures are necessary to ensure this species's survival. Because the dusky shark is a prohibited species and fishers cannot catch any, continued protective measures could focus on reducing dusky shark bycatch. One NMFS model calculated a coin-flip chance of dusky shark recovery by 2107 if bycatch deaths went down by 24% to 80%, while the court pointed to another study finding that population recovery could take up to 400 years.[10] The MSA requires that NMFS uses the best scientific information available. Developing accountability measures that change fishing practices based on these data is the first step to ensuring dusky shark recovery and keeping these sharks off fishers' lines.

Strider Kachelein was a legal intern at the Mississippi-Alabama Sea Grant Legal Program in Summer 2019. He is a law student at the University of San Diego School of Law and will graduate in 2021.

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In Sum.

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

★ *Fish, mammals, and birds caught as bycatch annually, in tons:*	38.5 million
★ *Percentage of annual marine catch that is tossed as bycatch:*	40
★ *UN limit on length of driftnets:*	1.5 miles
★ *Gulf shrimpers that voluntarily use bycatch reduction devices:*	89%

Different Applications of Regional Watershed Planning

Stephen Deal

Photograph: Mississippi Department of Marine Resources

The Mississippi River Delta, which is the largest delta system in the United States, pumps a considerable amount of freshwater into the Mississippi Sound, one of the region's primary coastal ecosystems. Human interventions over time have degraded this ecosystem, by pouring pollution, sediment, and excessive freshwater into the Sound. This year has been especially tough for coastal Mississippi. High rainfall in the Midwest has flooded the northern Mississippi River. To avoid flooding New Orleans, officials in Louisiana opened the Bonnet Carré Spillway. With half of its bays open, the Bonnet Carré Spillway released 147,000 cubic feet of water per second into Lake Pontchartrain and the Mississippi Sound.[1] This massive influx of freshwater has been a significant disruption to the ecology of the Mississippi Sound, for example, killing 128 dolphins and 154 sea turtles as of early June. The impacts of the Bonnet Carré Spillway opening underscore the need for water management and planning practices that are regional in scale. To accomplish a regional water planning approach, one must consider the whole watershed.

A watershed is essentially the base foundation for all water monitoring activities, as it is an area of land where all surface water drains into the same place.[2] Proactive watershed planning that transcends political boundaries can monitor key stressors within a large, aquatic ecosystem and can be useful in determining key conservation needs. It can also provide regulatory consistency, as many large watersheds cross multiple jurisdictional boundaries. Although regional watershed planning is not a substitute for local water management, it can provide an additional layer of regulatory oversight that can augment environmental restoration occurring in coastal communities.

Chesapeake Bay: A History of Water Management

With over 18-trillion gallons of water and 11,684 miles of shoreline, the Chesapeake Bay is the nation's largest estuary, including parts of Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia and all of the District of Columbia.[3] It is also the focus of a large, multi-state planning effort to improve water quality outcomes, and is a noteworthy example of the positive momentum that can arise from watershed planning.

The story of watershed planning in the Chesapeake Bay begins in 1973 when the Army Corps of Engineers released a large, multivolume existing conditions report on the bay.[4] The report chronicled many of the major causes of pollution within the bay and concluded by calling for a regional water management plan for the region. The first major step towards adopting such an approach was taken in 1983 with the Chesapeake Bay Agreement.[5] The agreement was a simple, one-page pledge signed by the governors of Maryland, Pennsylvania, Virginia, the mayor of Washington, D.C., the administrator for the U.S. Environmental Protection Agency (EPA), and the Chair of the Chesapeake Bay Commission, calling for a cooperative approach to the bay's water pollution. With this agreement in place, a coordinating office for the venture was established in Annapolis, and the Chesapeake Bay Program was born. In 1987 a new, much longer, agreement established numeric goals to reduce pollution within the bay, such as reducing nitrogen and phosphorous totals within the area by 40 percent by the year 2000.

The defining legacy of the Chesapeake Bay Program is its multi-state monitoring partnership. The Chesapeake Bay Monitoring Program established consistent standards for water monitoring in the states of Maryland, Pennsylvania, Virginia, and the District of Columbia. About 160 stations monitor water quality from across the entire Chesapeake Bay watershed to help ensure that the participating partners are in compliance with the standards set forth by the program.[6] In 2014 the monitoring program was extended further to include the states of New York, Delaware and West Virginia. While these states may not directly border the bay, there are many rivers and streams within these states that drain into the Chesapeake Bay and have an impact on water quality. Also, by maintaining a comprehensive monitoring partnership, the Chesapeake Bay Program is able to further enhance its goal setting and long-term planning process. For example, the Chesapeake Bay Watershed Agreement, established in 2014, includes 10 interrelated goals and 31 outcomes that worked towards advancing protection of the bay.[7] Some of the notable outcomes include population targets for key aquatic species, such as blue crabs and oysters, and acreage goals for wetland habitats and submerged aquatic vegetation.[8] This type of goal setting process would not be possible without the continual monitoring and regulatory oversight provided by the foundation.

Since the inception of the program in the 1980s, water quality has been steadily improving for the Chesapeake Bay. Recent data compiled by the Chesapeake Bay Program found that 42 percent of the bay and its tidal tributaries achieved clean water standards, which is the highest water quality ranking the bay achieved since monitoring first began in 1985.[9] In 2017 the program recorded the largest amount of submerged grasses in the bay since monitoring began, with an estimated 104,843 acres of grasses within the bay. These environmental achievements are solid proof of the power and transformative potential of watershed based planning. By implementing a consistent set of standards and monitoring practices for multiple states and jurisdictions, the Chesapeake Bay Program is able to effectively address the challenges associated with a vast watershed covering thousands of square miles.

Sowing Seeds of Change in Lake Pontchartrain

A different style of watershed management is found concerning Lake Pontchartrain in Louisiana. With a width of more than 40 miles, Lake Pontchartrain is the second largest inland saltwater body in the United States and one of the great natural treasures of the State of Louisiana.[10] The 5,000-sq. mile watershed for Lake Pontchartrain includes one of the most densely populated urban areas in the state and, over time, this heavy, urban footprint has adversely affected water quality within the lake. In the 1980s sewage and other pollution from nearby cities had reached a point where Lake Pontchartrain was becoming unsafe for human recreation.[11] In response to this problem, a group of Tulane and University of New Orleans professors wrote a report entitled "To Restore Lake Pontchartrain," which outlined a proposal to improve the

lake's water quality. This proposal helped inspire local citizens to form the Lake Pontchartrain Basin Foundation in 1989, an organization tasked with improving water quality in Lake Pontchartrain and other waterways throughout the basin.

The first major success of the program occurred in 1990 when the foundation was able to ban the dredging of Rangia clam shells, which had caused increased sedimentation in the lake and harmed the clam populations. The foundation also gave support to an EPA mandate requiring New Orleans to update its sewage and drainage system. Another important outcome of the foundation's work is its basic mapping services, which enhance local understanding about the Lake Pontchartrain basin. For example, visitors to the foundation's website can sign up to receive hydrocoast maps. These maps, which are updated biweekly, provide comprehensive information on water movement and the most recent distribution of water salinity across the basin.[12] Like the Mississippi Sound, Lake Pontchartrain is highly sensitive to high rainfall events and river diversions, which can dramatically alter the salinity of the lake.

The array of data provided by the foundation goes beyond mapping as the foundation conducts regular water quality monitoring within Lake Pontchartrain. Ten recreational sites are sampled on a weekly basis and another 10 sites of interest along Lake Pontchartrain are sampled monthly.[13] Basic water quality parameters, which are measured during the process, include: fecal coliform levels, water salinity, and dissolved oxygen levels. The findings from the weekly water sample sites can be found on the foundation's webpage.

Since its founding in 1989, the Lake Pontchartrain Basin Foundation has made considerable advancements in improving the water quality outcomes of the lake. In 2006, the majority of the lake was declared safe for recreation, as bacteria levels in the lake dropped significantly. Also, because of the significant strides made in improving water quality within the lake, Lake Pontchartrain also became the largest body of water to be taken off the national impaired water list. These results are a powerful testament that a watershed group cannot only be a strong advocate for environmental change; it can also be the organizational personification of Lake Pontchartrain's environmental concerns and issues.

Conclusion

The difficulty with watershed planning is that water pollution does not respect political boundaries. In the case of large river systems like the Mississippi, the adverse effects of water pollution upstream can be significantly compounded several hundred miles downstream. While the challenge of watershed planning for a large water body like the Mississippi Sound can be immense, the upside is that water bodies can heal quickly and recover if appropriate measures are taken to restore habitat and monitor water quality on a consistent basis. A good watershed planning effort can help forge uniform water quality standards for multiple government jurisdictions.

Watershed planning and organization are not static efforts. A watershed group must be mindful of whether it is making full use of its cultural and financial resources and, it must occasionally evolve to develop new resources and institutional connections. If a watershed organization can establish uniform standards and monitoring protocols while also growing and adapting to confront emerging issues within the watershed, then it has the makings of an exemplary watershed organization. Examples from Chesapeake Bay and Lake Pontchartrain are testaments to the lasting impact watershed planning can have upon the environment and in promoting better stewardship of valuable natural resources.

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