

Release Mortality Symposium Summary Report

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I. Executive Summary

The Gulf of Mexico Fishery Management Council (Council) hosted a Release Mortality Symposium with the goal of reducing discard mortality from recreational fishing efforts. The objective of the meeting was to create an action plan for the recreational fishery to promote the use of barotrauma mitigation tools, enhance data collection efforts, and incorporate the results into stock assessments and management. Reducing discard mortality could allow for increased harvest and would address numerous National Standards of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

During the meeting, it became clear that discussions and recommendations about reducing discard mortality would have to extend beyond the sole focus of reducing barotrauma related mortality. In recognition that release mortality occurs for many reasons other than barotrauma alone, the focus of the Symposium shifted towards the reduction of release mortality as a whole.

At the Symposium, private, charter, and headboat groups uniformly recommended that anglers should be allowed the flexibility to choose which release mortality mitigation technique to use and indicated that anglers should be provided with best practice recommendations that prepare them to make the best decision on how to handle fish under differing conditions.

Next, the panel suggested that current monitoring programs should be consistent and recommended that each program ask for the same information on discards including the number, species, mitigation technique used, condition upon release, and depth at capture. It also noted that existing surveys should continue to be used and improving those surveys, rather than creating new ones, will improve discard data collection most efficiently.

The panel identified and prioritized numerous gaps in discard and release mortality related data. Across all categories, informing 'best fishing practices' was a top priority. Improving estimates on current discards by species and gaining a better understanding of predation were identified as important biological data gaps. The fisheries-dependent data gaps identified as priorities include: collecting consistent data on discards and optimizing current fisheries-dependent surveys. Last, the panel prioritized data gaps related to our understanding of angler decision making. Those human dimensions related data gaps that were prioritized include understanding novel ways to incentivize angler behavior and knowing more about predation and how to react to it.

Finally, achieving consistent messaging to anglers across the Gulf of Mexico (Gulf) was recommended. It suggested that one central voice should assemble research based best fishing practice recommendations and messaging for dissemination. The panel suggested that control of the project would most appropriately be housed by an agency to ensure that updates to research, recommendations, and messaging persist beyond

single opportunity, project-based funding. The panel said that the Council should remain the point agency in control due to the work it has already done on the *Fishing for Our Future* website and because of its positioning with state and federal agencies across the region.

II. Introduction

The Gulf supports the most active recreational fishery in the nation. Hospitable at-sea conditions and the vast number of angler access points along the coast makes recreational access to the Gulf relatively easy. Steady coastal population growth and increased technological efficiencies have also driven up the incredible amount of recreational fishing pressure in the Gulf. Currently, numerous fish stocks are rebuilding and the recreational angler's ability to harvest fish is constrained within seasons, bag limits, size limits, and annual catch limits. This frequently causes recreational anglers to discard fish. A proportion of discarded fish suffer mortality for a variety of reasons including barotrauma, excessive handling time, gut hooking, or predation upon release. In recognition of this problem, the Council is interested in developing strategies to reduce the mortality of released fish. Reducing discard mortality could allow for increased harvest thereby achieving optimum yield more efficiently and would address numerous National Standards of the Magnuson-Stevens Act.

In 2017, the Council developed a policy recommending the use of venting tools and descending devices (<http://gulfcouncil.org/wp-content/uploads/Gulf-Council-Policy-on-the-Use-of-Venting-Tools-and-Descending-Devices.pdf>). The Council agreed that it should take responsibility as the coordinating body for reducing discard mortality across the Gulf and decided to host a meeting of scientists, managers, and stakeholders to develop an action plan. Such a plan would include information dissemination, science, and monitoring needs that ensure the Council's Descending and Venting Policy purpose and objectives are both measurable and successful.

The Council developed its *Fishing for Our Future* webpage (<http://gulfcouncil.org/fishing-for-our-future/>) as a first step to increase awareness about this topic, and to prioritize and support future research of it. This webpage displays information on the magnitude of discard mortality, suggests best fishing practices to mitigate discard mortality, curates partner outreach materials, and houses a comprehensive list of research relevant to discard mortality in the Gulf. The Council is now developing an action plan to ensure that the Descending and Venting policy's purpose and objectives are successful and coordinate with the needs of the Natural Resources Damage Assessment (NRDA) Open Ocean Restoration Program.

The Release Mortality Symposium consisted of two separate workshops; a Science Workshop and a meeting of the Council's Outreach and Education Technical Committee. The objective of the Science Workshop was to focus primarily on the recreational sector and create a roadmap/action plan to promote the use of barotrauma mitigation tools, data collection efforts for discard mortality by fleet and species, and incorporate the results into stock assessments and management. The workshop was

populated by a panel of invited scientists, managers, and fishermen and facilitated by staff from the Council and Florida Sea Grant. The Outreach and Technical Committee's objective was to make recommendations about how to effectively communicate best fishing practice recommendations to reduce recreational discard mortality. Meeting materials and presentations are archived at <http://gulfcouncil.org/meetings/technical/archive/>.

a. Magnitude of Discard Mortality of Reef Fish in the Gulf of Mexico

Discards in the recreational fishery exist for a variety of reasons, many of which are related to regulations. Fish are discarded because they're under the minimum size limit, out of season, or because anglers have already retained their bag limit, and some fish are voluntarily discarded because anglers prefer to catch and release. In the Gulf, discard mortality is a big problem. Growing populations of people and fish intensify the magnitude of discards. Reducing dead discards could extend fishing opportunities or allow for novel management approaches.

The Council, in collaboration with the National Oceanic and Atmospheric Administration (NOAA) Southeast Fisheries Science Center (Science Center), created a *Discard Dashboard* to display the magnitude of discards over time. That tool is currently housed on the Council website at <http://gulfcouncil.org/fishing-for-our-future/>, and displays discard data on red snapper, gag, and greater amberjack. The data used in the tool is based on the most recent stock assessments for each species and some estimates are associated with high levels of uncertainty. Discard data is often less well-known than other types of fisheries information used in management. The imprecise estimates are a result of numerous factors including: errors associated with self-reported data, small sample sizes, changes in fishing behavior, and seasonal effects.

The NOAA Science Center created a decision support tool that allows users to simulate changes in discard mortality rates to evaluate how over fishing limit recommendations would be impacted for red snapper, gag, and greater amberjack. The tool interacts with the stock assessments and the accuracy of results is directly dependent on the accuracy of current discard mortality rate estimates. The current red snapper discard mortality rate is 12%, split into closed and open seasons. If red snapper discard mortality is eliminated entirely, this would increase the overfishing limit by 8.5%, if discard mortality is cut in half, then the overfishing limit would increase by 4.5%. For greater amberjack, eliminating discards would allow for a 16% increase in the overfishing limit, while a 50% reduction in discards would yield about an 8% increase in the overfishing limit. Gag grouper could potentially experience a 120% increase in the overfishing limit if discards were eliminated but, this may not be realizable because annual landings have been less than that of the annual catch limits in recent years.

b. A Synopsis of Research on Recreational Fishing Practices and Discard Mortality

Research that is either directly or tangentially related to discards and discard mortality is already being conducted across the Gulf.

The Eastern Gulf is characterized by a broad, shallow shelf, so anglers have to go far offshore to get into deeper water. However, over half of the fishing effort in the Gulf takes place in the Eastern Gulf, so even low mortality rates can lead to a significant amount of removals. Also, in the Eastern Gulf, temperatures are relatively high and predators including sharks, dolphins, goliath grouper, and barracuda are prevalent, so release mortality is often associated with factors other than barotrauma. Understanding discard mortality requires ongoing, comprehensive studies that account for spatial and temporal distribution of fishing effort; selectivity; gear; and release methods. In the Eastern Gulf, both conventional and acoustic tagging studies are being conducted to measure all sources of mortality. Observers ride along on a subset of for-hire trips to observe discards and record location and depth of capture; hook size and type; species and length; condition of fish; and release method. Studies have also been conducted to understand the relative survival of fish that are released on the surface versus fish that are rapidly recompressed. The Eastern Gulf also participates in the ITag network, an array of receivers placed throughout the Gulf to learn more about fish movement.

In the Northern Gulf there is intense fishing pressure, and access to deeper waters is relatively easy. Studies have shown that descenders work well, but in some years, predation is so intense in this area that dead discards are hard to avoid. Studies have been conducted to estimate the survival of discarded red snapper using acoustic telemetry. Scientists experimented with cage releases to deter predation and found that dolphins learn to directly target cages and remove fish. Sharks are attracted by cages, but dropping them close to the reef allows fish to swim directly to shelter and remotely opening cages also deters shark predation. Using cages to descend fish does require hardbottom because muddy, silty bottom can surround cages and cause death due to low dissolved oxygen. It was noted that survival often seems to be associated with bringing fish up quickly and releasing them quickly using a dehooking device, and this is especially true in shallower waters.

Generally, there is less intense fishing pressure in the Western Gulf, and some fish stocks are more abundant in the region. Studies have been conducted to estimate the survival of discarded red snapper using acoustic telemetry. This has been useful in comparing the performance of different release tools to reduce discard mortality and also helps to quantify delayed mortality. In the summertime, non-vented fish have poor rates of survival, and in other seasons mortality was similar for vented, descended, and non-vented fish alike. It was also found that descending provides more benefits in shallow waters and the deeper you go, survival rates become more similar for descending and venting. Scientists in the Western Gulf conducted a Gulf-wide survey of recreational anglers that was coupled with some ride-along observations. The survey found that a majority of fishermen stay within 30 miles of shore and that most fish in

depths less than 125 feet. A high proportion of anglers vented fish, while only a small fraction had any knowledge of descending devices. After using the SeaQualizer descending device, a majority of private and charter boat operators preferred it to venting, while headboat fishermen still preferred venting tools.

c. West Coast Success Story: Yelloweye Rockfish Barotrauma Mitigation and Incorporation into Management and Stock Assessments

Fisheries management off the Pacific coast of the United States has successfully improved recreational opportunities for yelloweye rockfish by actively reducing discard mortality. Groundfish stocks experienced deep declines during the 20th century and effective management measures including: time and area restrictions, bag limits, and no-retention of overfished stocks, stopped over fishing from occurring. All but one stock, yelloweye rockfish, was rebuilt through these efforts.

In an effort to improve recreational fishing opportunities while continuing to successfully manage healthy fish stocks, managers, academics, and fishermen took the initiative to get involved to find novel ways to reduce discard mortality. Together they found numerous ways to descend fish to reduce barotrauma related mortality. The Pacific Fisheries Management Council and its partners endeavored to bolster estimates of discard survival and improve rockfish stock assessments. Additionally, state recreational catch and effort surveys were modified to collect data on depth of capture of released rockfish and at-sea observers recorded disposition of discarded fish on for-hire vessels. These efforts resulted in better estimates of release mortality by depth and species. Ultimately, this has allowed the Council to apply survival credits to the fishery and relieve constraints to fishing opportunity.

III. Release Mortality Risk and Mitigation

A variety of factors affect the likelihood that a fish will survive post release. Variations in species biology; at-sea conditions such as dissolved oxygen, depth and seasonality; the fishermen's skill level such as fight time; and release techniques all contribute to the condition of fish upon release. This makes it difficult to create simple, unilateral recommendations on best fishing practices across the Gulf. Sometimes, varying factors compound one another and create situations where firm guidance on how to best handle fish and devices to minimize release mortality can actually result in greater harm. For example, under certain conditions the use of a descending device to mitigate barotrauma could be considered a 'best practice'; however, if anglers are catching fish at a rate faster than they can be descended, it might *not* be most beneficial to extend the surface time of those fish as they wait on a deck to be descended. In this scenario, it might be more beneficial to quickly dehook the fish with minimal to no handling, or to vent the fish.

a. Risk Factors Contributing to Mortality after Release

The panel identified a suite of different factors that affect the probability that a fish will experience barotrauma. At the beginning, this discussion was focused specifically on barotrauma, but it became apparent that barotrauma was not the only factor contributing to post-release mortality. In fact, barotrauma was identified as only one contributor to overall release mortality because a majority of anglers fish in relatively shallow depths. The panel recognized that focusing on mitigating barotrauma alone may not achieve the desired result. In fact, improper mitigation could cause unnecessary mortality if other factors that contribute to release mortality, such as hook placement, surface time, or depredation, are not considered.

The panel recognized that different risk factors would affect each species differently. For example, hogfish are very susceptible to barotrauma mortality at shallower depths than most species, while greater amberjack are more susceptible to post-release mortality from increased fight time.

With that in mind, the panel compiled a general list of factors that contribute to release mortality and, when possible, stratified the risk associated with each factor by identifying what would constitute a high, medium, or low amount of risk. Then, the panel identified the risk factors that have the most affect on post-release mortality (The most important risk factors are highlighted in green on the risk matrix).

Depth of capture was identified as a major contributor to the likelihood that a fish would experience post-release mortality. The deeper a fish is harvested, the more vulnerable it is to barotrauma; and fish harvested from below 200 feet will almost always require some type of barotrauma mitigation. The panel said that most fish caught in depths less than 50-65 feet would not be severely impacted by barotrauma. In this case, other risk factors would be larger contributors to post-release mortality. The amount of time a fish spends out of the water and the manner in which it is handled are directly related to its chance of survival. Shorter surface intervals and less handling are associated with a greater chance of survival. Water temperature is another factor contributing to release mortality. Warmer waters create greater risk, and temperatures above 80°F/30°C contribute to increased mortality upon release. Increased water temperature is closely related with reduced dissolved oxygen levels. The panel noted that fish being returned to environments with low dissolved oxygen levels were less likely to survive release. The panel also identified hook placement as a major contributor to post-release mortality. Fish hooked in the gut have a low chance of post-release survival. The panel mentioned that it supported the regulation requiring the use of non-stainless-steel circle-hooks when fishing with natural bait because it helped avoid gut-hooking. Additionally, the amount of time a fish spends fighting on the hook increases the likelihood that it will die upon release. Finally, it was noted that the presence of predators in the water upon release would negatively impact fish survival. It is important to note that the panel realized that many of these risk factors are related and either affect one another or can be nested within one another.

Table 3.1. Release Mortality Risk Matrix

Risk Factor	Low Risk	Medium Risk	High Risk
Depth of capture	<50 ft	50 - 100 ft	>100 ft
Water Temperature	<70°F / <20°C	75-79°F / 20-30°C	above 80°F / >30°C
Hook mortality - placement	Lip		Gut or Gill
Fight time	"short"		"Long"
Handling time at the surface (also species specific)	"short"		"Long"
Dissolved Oxygen (DO)			< 2 mg/l
Predators			Dolphins in area
Depth of release			
Air Temp/differential			10°F
Season	Winter		Summer
Fish Size		10 - 12 lbs	>12 - 15 lbs
Hook type	Circle	J-hook	Treble
Susceptibility to hook mortality			
Fish Feeding Behavior	Aggressive feeders are less likely to swallow the hook		Voracious feeders who gulp the bait
Moon phase or anything else impacting "the bite"			
Thermocline	thermocline is absent		thermocline is intense
Depth of bait/hook	at the surface		on the bottom
Number of hooks in the water	less anglers		more anglers
Speed of "the bite"	Slow		high
Angler experience	High		low
Environmental conditions (current, wave height)			
Fish Ecology/behavior	highly mobile/low catchability		high site fidelity
Handling methods - gaffs, towels, boarding methods			
Mitigation strategy - how long does it take?			
Fleet			

b. Best Practice Recommendations by Fleet

The panel and audience broke into three separate, fleet-specific groups; private anglers, charter anglers, and headboat anglers. Individuals self-selected the most appropriate fleet based on their expertise. The groups were tasked with creating recommendations for best practices to minimize release mortality that was specific to their fleet. The groups were asked to consider the varying conditions identified in the risk matrix and craft recommendations with the context that ideal conditions are not always present. This encouraged the groups to consider more nuanced recommendations.

All three groups indicated that anglers should be allowed the flexibility to choose which release mortality mitigation technique to use and indicated that anglers should be provided with best practice recommendations that prepare them to make the best decision on how to handle fish under differing conditions.

The following is a brief summary of each fleet's best practice recommendations:

Private Anglers

1. Have a plan. Identify target species, depth, etc., and ensure you have the right tools onboard to handle the situations you'll be fishing (e.g., dehooker, venting tool, and descending gear).
2. Follow best practice guidance:
 - Keep fish in the water, use wet hands to handle fish
 - Minimize handling and fight time
 - Use knotless nets
3. If you see something, do something. Assess the situation. Descending is ideal when possible, but if not practical then vent.

The private angler group also identified the critical importance of creating consistent messaging across the spectrum of different communications methods. Universal, research-based guidelines for recreational anglers should be developed. Those guidelines should be based on depth, species, and seasonality. Anglers that target deeper depths should be prepared to have the right tools onboard, while more shallow water anglers should be aware and ready to deal with barotrauma if necessary. Species specific recommendations should inform anglers of which species suffer significant mortality even in shallow depths. Recommendations based on seasonality should be emphasized to ensure that anglers are especially vigilant and return fish to the water as quickly as possible when outside temperatures are high.

Charter

1. Circle hooks should be used at all times.
2. Fight time should be minimized. Heavy tackle should be provided when feasible, although this could deter the bite and some trips or operations specifically provide light tackle fishing experiences.
3. Descending is the gold standard in the right conditions, but not always feasible. Descending multiple fish at one time is not practical because of the weight and hardware required to operate a device capable of descending numerous fish. Descending is recommended in deep water.
4. Do what you can because best practices are situational.

The charter group discussed a charter association in the western Gulf that requires its members to follow certain release mortality mitigation practices through a 'conservation covenant.' According to this covenant, which is still being drafted, members agree to use SeaQualizer descending devices when necessary. This could serve as a model for other organizations and allows fishermen to regulate themselves for the good of their fleet and resource, rather than a blanket regulation that mandates the use of a specific device.

Headboat

1. Venting is recommended as a primary means of mitigating barotrauma. Most trips are relatively shallow, so descending is not critical.
2. Proper dehooking is just as important as barotrauma mitigation.
3. Undersized or out-of-season fish should be thrown back as quickly as possible. Minimizing handling takes precedence.
4. Floaters should not be tolerated and customers should be encouraged to take responsibility for the survival of their fish.
5. Vulnerable species such as hogfish and gray triggerfish should be identified and addressed with extra care.
6. Legal fish that are obviously imperiled and not likely to survive should be retained.
7. Model anglers should be allowed to select their method of release mortality mitigation based on situation.

The headboat group emphasized the importance of angler education. It suggested that captain and crew should take responsibility for the education of anglers aboard their vessels, both by leading by example and by teaching stewardship and optimal handling methods to their customers. Education or training for captain and crew could be considered. A certification program for guides and/or anglers could teach fish handling proficiency and could be incentivized with a tool give away or even consideration of differing regulations.

IV. Current Science and Data Gaps

Accurate estimates of discard mortality are important because the magnitude of removals, which includes dead discards, influences the perception of stock productivity and biomass. These values directly guide recommendations on how much fish can be harvested and, consequently, affect angler opportunities to retain fish. Unfortunately, estimates of discards are often based on sparse data or are estimated using un-tested assumptions. Information on mortality rates associated with discards is non-existent in some cases, especially as it relates to specific species, fleets, or seasons (open or closed). Analysts from the Science Center stated that stock assessments would benefit from better information on the number of discards, species, depth of capture, disposition, mitigation technique used, and reason for release.

a. Existing Monitoring Programs and Recommendations for Improvement

Numerous programs across the Gulf collect information relevant to recreational discards and discard mortality. All of the different programs inform stock assessments, but they do not collect information on discards that is consistent. In some cases, this leaves large gaps in our regional, species specific, and fleet specific understanding of discards and discard mortality. Due to limited data, many of the monitoring programs that collect information on discards rely on self-reported angler data. Inaccuracy in reporting these data can significantly bias estimates and the related assessments. This can lead to uncertainty in the biomass estimate and health determination of the fish stock.

The following is the list of monitoring programs identified by the panel that collects information relevant to recreational discards:

- Marine Recreational Information Program (MRIP)
- LA Creel
- Florida Gulf Reef Fish Survey
- Florida Observer Program
- iSnapper
- Southeast Regional Headboat Survey
- Mississippi Tails n' Scales
- Mississippi Observer Program
- Alabama Snapper Check

- The Great Red Snapper Count
- Federal For-Hire Electronic Reporting for Charter Vessels (not yet implemented)

The panel suggested that existing surveys should continue be used and that improving those surveys, rather than creating new ones, will improve discard data collection most efficiently. Additionally, efforts should be focused on improving the data that provide the greatest gain and are most sensitive in the stock assessment models. The panel made the following recommendations about how to modify existing monitoring programs to improve discard and discard mortality estimates in the Gulf recreational fishery:

1. A single, Gulf-wide program would be ideal for mitigating the uncertainty surrounding discard estimates; however, this is not practical. Instead, each program should ask for consistent information on discards including the number, species, mitigation technique used, condition upon release, and depth at capture. The panel suggests that this issue would be most appropriately addressed at the Gulf States Marine Fisheries Commission. The panel also indicated that the Council should express that this is a priority to its partner agencies.
2. Because data on discards is primarily self-reported in nature, especially in the private angling fleet, the quality of self-reported data needs to be improved. This could be accomplished with improved observer coverage (in-person or virtual), or by pre-notifying anglers that they may be asked to provide detailed information on their discards.
3. While data on discards per trip do contribute to the assessments, a clear understanding of fishing effort is required to understand the magnitude of discards. Estimates of fishing effort must be improved to gain a more accurate understanding of total removals including discards and related mortality.

b. Prioritized Data Gaps

Throughout the workshop panelists identified numerous gaps in discard and release mortality related data. The panel was asked to categorize each gap by identifying whether it was most appropriately considered to be biological, fisheries dependent, or human dimensions based in nature. Biological data gaps are specifically related to the morphology, condition, or behavior of the fish themselves; fisheries dependent data gaps are relevant to fishing conditions and angler action; and humans dimension data focus on angler decision making and behavior. Note that in some cases, a single data gap was classified into more than one category.

Participants were asked rank the top three data needs in order of priority for each category. First priority rankings were assigned a point value of three, second priority rankings were assigned a point value of two, and third priority rankings were assigned a point value of one. The following tables show the identified data gaps with their relative ranking for each category. Data gaps without a score of zero are listed in no particular order.

Table 4.1. Prioritized Biological Data Gaps

Biological	Point Value
Mortality estimates of species with few data	45
Research on best practices	18
Research on predatory patterns	16
Species specific research (morphology, etc.)	12
Improve existing data programs	11
Research on surface handling time	6
Research on dissolved oxygen	3
Research on angler skills and released fish outcomes	2
Research on descending release depth	1
Research on temperature upon release	1
Less popular species information	1
Catastrophic decompression	0

Biological data gaps are related to morphology, condition, or behavior of the fish themselves. In many cases, there is little to no information on the actual discard mortality of managed species in the Gulf. This is compounded by a lack of data on discards themselves. This biological data gap is a clear priority identified by the panel. A better baseline understanding of the actual rate and magnitude of discards and dead discards is essential to improving our current understanding of discards, as well as improving our understanding of how future changes to fishing practices affect discards. The panel also identified a need for more biological information to inform ‘best fishing practice’ recommendations. Best practice recommendations can be species dependent and rely on an understanding of fish morphology and tolerance to a variety of different conditions. The panel also noted that more research needs to be conducted on predation and the behavior patterns of predators. Depredation is a major contributor to post-release mortality and the panel highlighted a need to better understand predatory patterns and, potentially, gain insights on how to deter or avoid predatory behavior.

Table 4.2. Prioritized Fisheries Dependent Data Gaps

Fisheries Dependent	Point Value
Best practices based on species, gear type, depth, season, and temperature	24
Consistent discard data across all fisheries dependent surveys	19
Optimizing existing fisheries dependent surveys	16
Predation during descent	13
Recreational effort distribution across depth and season	12
Species specific research	7
Expand Florida observer program	4
Research on hoot/mitigation technique compliance	4
Research on barbless hooks	3
Speed of decompression and recompression	2
Current mitigation use across sectors	1
Catastrophic decompression	0
Research on hook injuries	0
Descending release depth	0
Efficacy of anglers	0
Success of non-traditional release methods	0
Temperature at release	0

Fisheries dependent data gaps are relevant to fishing conditions and angler action. Research on how anglers capture and handle fish, and how their behavior contributes to the survival or mortality of fish is the fisheries dependent data gap identified by the panel as its first priority. This information will both inform best fishing practice recommendations and contribute to our understanding of how future changes in fishing practices affect discard mortality. Next, the panel determined that it was a priority to collect consistent discard data from all fisheries dependent surveys and to optimize those surveys to ensure that the most appropriate data is collected in the best way. A uniform approach to collecting discard information would bolster estimates across the Gulf and create a more accurate understanding of discards.

Table 4.3. Prioritized Human Dimensions Data Gaps

Human Dimension	Point Value
Novel ways to incentivize release mortality mitigation measures	37
Research on best practices	23
Research on predatory patterns	20
Optimizing existing surveys	15
Current barotrauma mitigation use	13
Decision making of anglers to select mitigation technique	13
Research on the efficacy of anglers	5
Perceptions of various mitigation techniques/technologies	4
Research on barbless hooks	2
Research on handling time	2
Research on hook injuries	0
Speed of recompression and decompression	0
Barriers to weighted descent	0

Humans dimension data gaps specifically focus on angler decision making and behavior. The panel identified the need for more research on novel ways to incentivize the practice of release mortality mitigation behavior. A clear understanding of angler decision making may help to promote best fishing practice behaviors. The panel prioritized the need for more research on angler decision making behind best fishing practices. The panel clearly stated that it would like to retain a suite of release mortality mitigation options and gain a better understanding of how and why anglers choose certain mitigation options. This would help to make angler choice a more successful management option. Research on predation and the ways that anglers can behave to avoid or respond to predation was also prioritized. Current recommendations tell anglers to move away from predators, however, it would be helpful to have more research on potential solutions to the problem.

V. Communications Strategies to Reduce Discard Mortality in Recreational Fisheries

Reducing discard mortality across the recreational fishing sector will require effective messaging and communication to promote best fishing practices. This is especially true if best fishing practice recommendations allow for angler choice in different fishing conditions.

Research conducted on recreational angler perceptions regarding the use of descending devices suggests that barriers to using descending devices include their cost and a lack of angler confidence in proper use. Research conducted on the power of subjective norms in relationship to barotrauma mitigation suggests that attitudes, social pressure, and perceived control all determine someone's desire to perform a behavior, and applying social pressure is the most effective way to increase barotrauma mitigation behaviors.

The Council's Outreach and Education Technical Committee (Committee) was convened to discuss and develop outreach and communications strategies to reduce barotrauma in recreational fisheries. The Committee quickly decided that the conversation would need to be expanded beyond barotrauma to encompass recommendations on fishing and handling behaviors to reduce release mortality as a whole. This decision was made because there are numerous things that anglers can do beyond venting and descending to improve post release survival.

The Committee highlighted the importance of achieving consistent messaging to anglers across the Gulf. It suggested that one central voice should assemble research based best fishing practice recommendations and messaging for dissemination. This "central command" website repository would be tasked with housing pertinent information on safe handling, barotrauma mitigation, and other best practices for angling. Additionally, the information repository could house stock images and footage for use by other organizations to promote the Gulf-wide consistent messaging.

The Committee suggested that the website repository and control of the project would most appropriately be housed by an agency to ensure that updates to research, recommendations, and messaging persist beyond single opportunity, project-based funding. The Committee said that the Council should remain the point agency in control because of the work it has already done on the *Fishing for Our Future* website and because of its positioning with state and federal agencies across the region. The group also recommended that the website repository where information is housed and shared should remain unbranded by the Council. It was explained that the Council may not have the public image and support necessary to effectively unify recreational anglers to promote best fishing practices.

Instead, the website repository and ultimate control should be branded as its own organization, potentially named "Fishing for Our Future", but that organization should

have its own point person (who is potentially grant funded and housed in the Council office) and perhaps be advised by a fisherman populated steering committee. It was explained that this model would follow the Marine Resource Education Program’s format where an established organization, in their case the Gulf of Maine Research Institute, handles logistics and keeps the program operational while all actions are advised by its steering committee which is populated by fishermen, managers, and communicators from the region. This would allow the “Fishing for Our Future” effort to remain “for the fishermen, by the fisherman,” with agency support.

The Committee suggested that “Fishing for Our Future” do the following specific things to ensure that best fishing practices, including advice on the proper use of venting tools and descending devices, be communicated effectively across the Gulf:

- Curate an email list of its partners to create a feedback loop that keeps its partners and audience abreast of new information and promotes consistent messaging.
- Create narrative content for fishermen by fishermen. This will ensure that messaging aims to create the subjective norms necessary to change angler behavior.
- Draft messaging tailored to various audiences including business, organizations, and individuals. Materials should be developed to support dissemination in multiple formats including: brochures for in-person distribution, videos and web resources for on-line distribution, and lesson plans and presentations for in-person events.

a. Recreational Influencers across the Gulf

The Committee collaboratively created a list of businesses, organizations, and individuals that influence the fishing public. Materials and messages created by “Fishing for Our Future” should be directed at these influencers in hopes that they will help disseminate and magnify communication efforts. The Committee also suggested a number of events where it would be appropriate to disseminate best practice information directly to anglers across the Gulf. In addition to the information below, the Florida Fish and Wildlife Conservation Commission shared its database of appropriate contacts, because of the exhaustive nature of that list, it is not directly included in this published list, but has been added to the Gulf-Wide “Fishing for Our Future” contact database.

Table 5.1. Gulf of Mexico Recreational Communications Influencers

Media	Contact
Radio/TV/Local News/Social Media	Don Dubuc
Outdoor writer/freelancer – Social Media	Todd Masson
Outdoor television show/Local News Fishing Report	CT Williams

Outdoor Writers Association	Joe Macaluso
Find Your Outdoors TV Show	Frank Wilem
World Fishing Network - host of Florida Sportsman weekly Action Spotter Podcast-Florida Sportsman's Magazine	Rick Ryals
Publisher of Florida Sportsman and producer of Florida Sportsman Waterman TV focused on conservation	Blair Wickstrom
Editor of Florida Sportsman print magazine	Jeff Weakley
Publisher of The Fishing Wire online newsletter	Frank Sargeant
Freelance outdoors writer and marketing specialist for fishing guides St. Petersburg	David A. Brown
Editor Saltwater Sportsman magazine	Glenn Law
Editor Sportfishing Magazine	Doug Olander
Florida Outdoor Writers Association director	Butch Newell
FM Talk 106.5 outdoors program	Sean Sullivan
Alabama Saltwater Fishing Report Podcast at greatdaysoutdoors.com	Joe Baya
Alabama Saltwater Fishing Report Podcast at greatdaysoutdoors.com	Butch Thierry
WNSP Outdoors radio show	Alan White
Nautical Mile Magazine	
Coastal Angler magazines	
Florida Sportsman magazine/expo	
Business	Contact
Yamaha Marine Group	Martin Peters
Fisher-Man Guide Services	Ronnie Daniels
Charter fisherman Sports Unlimited Inc.	Clarence Seymour
Shore Thing Fishing Charter	Sonny Schindler
Cold Blooded Fishing	Richard Rutland
Circle H Charters	Scott Hickman
Galveston Sea Ventures	Shane Cantrell

Williams Party Boats	Johnny Williams
Reel Animals Fishing team (also radio show)	Mike Anderson
Salt Strong Fishing	Joe Simonds
In charge of all Bass Pro Shops/Cabela's Pro staff	Amanda Popp
Double Down Sport Fishing	Brice Barr
Key West Deep Sea Fishing	Richie Gomez
World Angling Fishing Charters	Will Benson
Compass Rose Sport Fishing Charters	Mike Weinhofer
Jim Sharpe	Sea Boots Charters
Yankee Captains Key West	
Plano tackle boxes	
Mustad Hooks	
Flambeau Outdoors	
Fish Stix	
Penn Reels	
Rtic coolers	
Line Cutterz	
Salt Life	
HUK	
Bill Dance	
Guy Harvey	
Orvis	
Academy Outdoors	
Cabelas	
Dicks Sporting Goods	
Grundens	
Columbia	
Costa	
Pure Fishing	

Yeti	
Engel	
Shimano	
Bass Pro	
Maverick Boat Company	
Sea Hunt	
Contender	
REI	
West Marine	
Community Leader/Organizations	Contact
CCA Louisiana	David Cresson
Ship Island CCA	Kyle Johnson
CCA Florida	Trip Aukman
CCA Alabama	Blakeley Ellis
VA Charter Boat Association	Ben Weber
Florida Keys Commercial Fishing Association	Bill Kelly
President of Florida Guides Association	Charlie Phillips
International Game Fish Association (IGFA)	
Florida Guides Association	
Ocearch	
Fishing's Future	
Galveston Professional Boatmans Association	
South Texas Fishing Association	
Alabama Charter Fishing Association	
Alabama Coastal Fishing Association	
Old Salts Fishing Club	
Key Colony Beach Fishing and Boating Club (over 200 members)	

Florida Outdoor Writers Association	
Events	Contact
Alabama Deep Sea Fishing Rodeo (new president each year)	Justin Thompson
Mississippi Deep Sea Fishing Rodeo	
Biloxi Boat Show	
Texas International Fishing Tournament (TIFT)	
Bass pro shops seminar events	
Fishing club meetings around the gulf	
King of the beach tournament	
Florida Keys Seafood Festival, January 18-19	

VI. Attendees

Panel:

Lee Benaka
 Shane Bonnot
 Gregg Bray
 Judd Curtis, Ph.D.
 John DeVore
 Phil Dyskow
 Troy Frady
 Tom Frazer, Ph.D.
 Ken Haddad
 Chad Hanson
 Kai Lorenzen, Ph.D.
 Jamie Reinhardt, Ph.D.
 Bev Sauls
 Steve Scyphers, Ph.D
 Matthew Smith, Ph.D.
 Andy Strelcheck
 Greg Stunz, Ph.D.
 Steve Szedlmayer, Ph. D
 Nathan Vaughan, Ph.D.

Ed Walker
 Abby Webster
 Dan Wolford

Council Members and Staff:

Angela Collins, Ph.D.
 John Froeschke, Ph.D.
 Martha Guyas
 Beth Hager
 Emily Muehlstein
 Ryan Rindone
 Camilla Shireman
 Carrie Simmons, Ph.D.