

## **Fishery: The Fear Factor in Management**

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I was visiting a shrimp dealer in Port Aransas this summer when I noticed a long picture on his wall. It was one of those 2-foot panoramic scroll pictures like they take of your high school graduating class. But this was a scene of nearly 100 big steel hulled gulf shrimp boats tied together side by side totally blocking Aransas pass to all boat traffic. It was 1989, and it was just one of numerous port blockades across the gulf. This was to be the largest single protest of marine fisheries regulations in US history, and it was all about the new turtle excluder devices (TED) required in shrimp trawls.

Now the TED had been in development for over 10 years. A huge investment in time and money had been expended to scientifically develop the best possible device. The industry had participated fully in hundreds of test runs on commercial vessels. The endangered status of turtles made for a clear resource need. The Endangered Species Act provided an unequivocal legal mandate. Other options like closed seasons and areas were much harsher on the shrimping industry. So why the massive protest that brought the wrath of the coast guard and national marine fisheries service down on their heads?

Anthropologists have studied this issue intently. There have been dozens of scientific articles and even whole books written, to try and explain this reaction. Socio-psychological paradigms have been applied, dependency theory versus modernization theory, urban versus rural power shifts, sum-zero game between recreational elites and traditional harvesters, and so on..

But in the end I think one word describes what drove the behavior of so many on all sides: FEAR!

And it was that fear, manifested differently for each group, and each person, that dictated the outcome of the TED wars, just as it has dictated the course of events in the Florida net ban war, the Texas and Louisiana gill net war, the New England ground fish war, the west coast salmon wa, the Canadian lobster trap wars, and on and on.

Fear is the poorly managed component in fishery management today, which has so often created unnecessary wars or prevented successful resolution of conflicts. That is my principal thesis for you today.

Now let me be honest about my credentials for speaking to this human attribute. I had one freshman class on introduction to psychology in college . . . . But, I've also watched these fishery battles from the inside and the outside for 25 years... on the job training you might say.

My second thesis for you today is that, by and large, the profession of marine fishery management has been a failure. Certainly, these managers have had a lot of help in creating those failures, but after decades of trying they still have so few examples of having achieved optimum yield from our public marine resources.

My credentials for this assertion are more formal: several fisheries degrees, dozens of journal and technical scientific articles, years of field sampling, hundreds of fishery conferences, director of the largest state marine sampling program in the U.S., chairman of the Gulf of Mexico Fishery Management Council. I am one of those fishery managers.

You want evidence that fishery managers are failures? Of the 300 known fishery stocks harvested in the U.S., 33 % are clearly overfished with many more approaching that status. Of the world's top 200 fisheries, 60 % are fully exploited or overexploited. In the Gulf of Mexico alone, red snapper, Nassau grouper, jewfish, red grouper, sharks, billfish, king mackerel, and red drum are all considered overfished.

What if 33% of the highway bridges in this country fell down each year? Would we think bridge engineers were doing the best they could, but it's just a real difficult job to keep a bridge in good condition, so we'll just let them keep on trying?

If you want evidence that some people don't think marine fishery management is currently working well, you might look at the number of lawsuits challenging specific management actions. Ten years ago there were just a handful of lawsuits, today there's 112 and growing daily against the national marine fisheries service alone.

Someone once told me that NOAA stands for national organization for the advancement of attorneys. But bringing in more attorneys is a natural reaction to being sued, and do you think being sued strikes fear in the heart of a fishery manager? Fear of the extra workload, fear of being proven wrong and losing credibility, fear of personal liability! Do you think the fear of being sued is capable of stifling much needed management initiatives? Why risk the hassle and heartache when you can legitimately claim you need more data or more stakeholder input before making a decision?

But now the national marine fisheries service has adopted a precautionary approach to fisheries management. We're supposed to err on the side of conservation. How can a lawsuit risk-averse strategy coexist with a resource risk-averse strategy?

One way is for the managers to make the decision matrix a clean, clear, simple, yes or no process. Enter the mathematical model. Doing fishery management by plugging values in a formula. If we use the best available data, then the answer that gets spit out must be the best as well, right? So what if we are trying to model a hugely complex ocean ecosystem that changes constantly.

I want to tell you that I am greatly impressed with the achievements of fishery modelers and statisticians throughout our profession. It's amazing to see Mother Nature turned into a computer program that actually attempts to predict fish population levels. The question about models, though, is whether they drive the management train or just provide guidance on which way the train should go.

Like the highway bridge engineer, we fishery managers want predictability in what we build. We want to be fish engineers. We want to take the guesswork out of this messy management business. Nothing to be afraid of if you have a

statistically defensible position. Crank out a number and end the debate over how many fish can be caught. But let's remember what the acclaimed statistician Dr. George Box wrote:

“All models are wrong, some may be useful.”

Let's consider the modeling efforts on red snapper, which is one of the most thoroughly studied fish in the gulf. Snapper are overfished, and the recovery timeline says we need full recovery by 2031. Now, in the process of calculating what full recovery is and how to get there by 2031, we have to know first how many fish are currently being caught, what age they are, and how fast they grow. We also have to know the number of eggs produced by all the mature female snapper in the Gulf of Mexico. Then we have to know the number of those eggs that will survive the gauntlet of natural and fishing mortality to become adult, spawning fish. Having made this simple calculation we now have to do the same thing for each of the new year classes over the next 31 years. Having now calculated what the snapper population will be in 2031, we're now ready to decide how many we can catch today to make sure we reach our 2031 target, assuming of course, that nothing changes in the Gulf currents or habitats, the predator-prey relationships stay the same, immigration, emigration, by-catch, fishing technology, and illegal harvest all stay the same.

Why are we surprised when managers and stakeholders alike look with unrestrained horror and fear on placing their careers and their livelihoods in the hands of this number crunching machine? Why do we see people who spent their whole life on a fishing boat suddenly carrying around laptop computers and trying to describe how the spawning potential ratio and the maximum fishing mortality threshold have been miscalculated?

But the show must go on. The national standard guidelines developed by NMFS demand it. And after the number crunching machine had finished digesting its meal, it revealed to the world that the biomass of red snapper in the Gulf of Mexico in 2031, when maximum sustainable yield was achieved, would be as high as four billion pounds. For comparison, the biomass at MSY for all the cod and haddock in the Gulf of Maine and Georges Bank combined is one-tenth that amount.

“All models are wrong, some may be useful.”

And it is the scientists themselves that know that the best. We are trained to know that every experiment has a bias, that the observer may be influencing the object being observed, and that you cannot ever fully prove the null hypothesis.

The good news is that people, decision makers in particular, still desperately want science to provide definitive answers to problems of the human condition. As abused and misused as science has been throughout our history, what is the universal cry we hear when a debate occurs? Do a scientific study, convene a scientific panel!

When fishery management decisions are challenged, what is the principal reason? It's because the science is bad. Let's get better science; let's collect more objective data. Everybody always agrees we need more scientific data. With this backdrop, the scientist should be in the driver's seat, but will scientists step up to the challenge or retreat to the safe, warm confines of some ivory tower? No hard allocation decisions, no political controversies, no public scientific opposition.

I know a professor of terrestrial ecology, one of the best scientists in this field at any university; he told me a story once about how he agreed to serve as a consultant on a controversial land preservation proposal. He did his study and he presented his scientific conclusions. But then he was put on the witness stand during a hearing — and there were the lawyers from the opposing side challenging his credentials, his methods, his conclusions, and his very objectivity. They raked him over the coals with technicalities, even though his results were perfectly valid. He told me he couldn't wait to get back to the safety of his office and vowed never to get involved in public policy issues again. He was afraid.

But if the best minds in our profession won't step into the ring and be willing to defend their science, who will? How will we make the best decisions for the resource and users if the people with some of the most valuable knowledge are sitting on the sidelines? And when should our scientists get involved in actively sharing their results? When the definitive study is finally done — when the last chapter of the book on the subject has been written? No. Whenever the decision-making process needs guidance, that's when our professionals need to be there. The fear of applying incomplete science has been one reason for our failures.

Let's return to our shrimper protest of TEDs. What were they afraid of and what did they really want? Dr. Anthony Margavio in his in-depth study of the TED wars found over 95 % of the shrimpers feared they would be put out of business. They feared a huge loss of shrimp from their nets. They feared the additional cost and injury potential of TEDs. They feared that accepting this new rule would just lead to even more restrictive rules.

It's interesting when Dr. Margavio was conducting interviews; he found that everyone wanted to talk to him so the "truth" could be heard. We hear that frequently at council debates. "I'm just looking for the truth." I think that's a sign that science is still a welcome participant and, in fact, may be able to supply a common ground, an agreed upon truth, on which stakeholders can build.

But we have our work cut out for us. For every legitimate fishery management tool, there is a legitimate stakeholder fear that must be dealt with. Size limits will reduce the supply of preferred fillet sizes and we'll lose our markets to foreign suppliers. Trip limits will reduce large vessel efficiency and we'll lose out to the small vessel fleet. Closed seasons will disrupt the steady supply demanded by the market. Closed areas will reduce valuable fishing grounds and lead to a takeover by environmentalists. Vessel monitoring systems will be an invasion of privacy. Vessel permits will allow for suspensions for minor fishing violations. Limited entry will prevent my kids from being fishermen. It will lead to a corporate takeover of the small businessman.

So what's a poor fishery manager to do? Even the good manager, trying to regulate for the long term, has to be afraid of all the future unknowns and the ever-present law of unintended consequences?

Science has not been forsaken in fisheries management, but it has been subjugated by fear and misunderstanding. To fix this we need to start by recognizing and managing our fears. Humanness is real. Fear becoming an irrational and intransigent force is real.

And when we find people who have found ways to manage their fears - both in the scientific and fishing communities - we need to empower them. Facilitate them; bring them forth as leaders. Let their courage infect their peers. Create an atmosphere where reason and logic are at least on an equal footing with fear.

I remember the Texas Parks and Wildlife's first workshop on implementing a limited entry program for commercial finfish fishermen. It was a large crowd of mostly big, rough, burly men who lived their lives on the water. Their livelihoods were declining because of our old nemesis - the tragedy of the commons - too many fishermen chasing after too few fish. But still they wanted nothing to do with being regulated by bureaucrats in Austin. And as their voices rose in opposition, the crowd grew surly, shouting insults and taunts at the managers. Someone yelled, "I bet there's not one real fishermen in this room that wants limited entry." suddenly a voice spoke from the corner, "Yes there is. I do." it was a well-known, hard fishing old-timer. The crowd quieted down. The discussion moved to the details of a limited entry program, and a year later the Texas governor signed the finfish limited entry act into law. And that old timer who had the courage to manage his fears is now the chairman of my finfish advisory committee.

I thank you very much for allowing me to speak to you today.