Summary of Proceedings

COASTAL FISHING: WHAT IS THE FUTURE?

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LSU Agricultural Center

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Preface

The proceedings represent a summary of comments by speakers at the workshop Coastal Fishing: What is the Future? The workshop was organized to acquaint attendees with a range of issues as well as the information needed to effectively resolve them in the future.

Fish populations are public resources. They are subject to competing user group harvesting. In the majority of cases, user group demand leads to full use of fish populations. Competition within a user group, such as commercial fishermen, results in conflict over gear, size at harvest, seasons, and other matters. When recreational and commercial user group-demand for a jointly utilized fish stock is high, conflict arises. Attempts to resolve conflict lead to regulations and prohibitions that affect various users differently. Allocation of fish is the result. It is hoped that the direct allocation to a certain group or the indirect allocation by making a group less competitive is based on well-organized scientific findings and full public participation.

Most of Louisiana's coastal fishery resources are fully utilized. With this knowledge and extensive personal experience, the attendees came together to discuss the future. The role of change, science, and leadership were discussed. The comments of speakers were recorded and summarized for the information of a larger audience.

The Importance of Coastal Fishing

by Dr. Ken Roberts
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Because the current situation and the future are important to resource owners and users, we have to expand our thinking about coastal fishing beyond biology and basic economics. We are going to have to look at some more advanced economic factors, and some social factors related to both the biological and economic aspects of resource use.

The Basics As We Know Them

In general, we all know that in coastal fishing demand often exceeds supply and that this demand is time-related. That is, people want fish now and in the future. Fishermen try to get a certain quantity of fish at a certain time. Demand also often exceeds supply from the perspective of fish size. As a result, we have regulations to protect the resource as to when (what season), what type (species and size allowable), and how many fish can be caught.

Recreational and commercial fishermen experience regulations that allocate fish. The regulations are designed to maintain the resource at a level so that some demands can be met in the future as well as at the present time. This means that the needs of a group may not all be met. Some sacrifice has to be made to save resource for the future.

Considerations for the Future

The coastal fishery is unique. We need to remember that fish are mobile resources; fish move inshore and offshore. Few species are exclusively state or federal fish. Both commercial and recreational fishermen might be fishing for the same species — at different times, in different places, and in different quantities. Management policy has to consider this diverse nature of the resource: it resides in waters regulated by different governments, it is sought by different user groups, and often more than one demand is made on the resource at the same time.

Allocation. A diminished ability to gain benefits results when demand exceeds supply. Allocation is the response. The total allowable catch is allocated on the basis of size of fish, quantity of fish, season that we want our fish, or who gets the fish.

This results in policies and regulations that take many forms:

•Louisiana Finfish Policy and Standards. This is a legislatively established policy written in 1989 by a group of people who were in the commercial and recreational sectors trying to prepare for directed allocation. Get to know these standards and policies. They were not picked by scientists but by people in several vocations with a common interest in the finfish resource.

•The Magnuson Fisheries Conservation and Management Act, known as the Magnuson Act, extended federal jurisdictional limits out to 200 miles back in 1976-77. The National Environmental Policy Act (NEPA), and a ruling in 1992 by the Inspector General of the United States are important to allocation. The Inspector General reviewed a North Pacific Fishery Management Council allocation plan and ruled it to be unsatisfactory. The North Pacific Council based its allocation decision on economic impact analysis. Allocation decisions, the Inspector General ruled, must be based on cost/benefit analysis. The approach allows for the estimate of net national benefits of an allocation. Impact analysis cannot indicate benefits. However, it is frequently used by the unaware for the inappropriate use of influencing allocation decisions.

Economics is the first thing people tend to think about when they look at a competitive fishery. To many people, allocation is as simple as whoever has the biggest number is the most credible person. Allocation economics is far more complicated. The economics profession and the previously noted federal legislation and findings are in agreement on this topic.

Numbers are used to determine facts about user groups or the fishery. For example, in the National Survey of Hunting, Fishing, and Wildlife-Associated Recreation, under the category of people 16 years old and older in the state of Louisiana who were saltwater fishing, there were 199,000 saltwater anglers in 1991. Of these, 41,000 (20%) saltwater anglers were nonresidents. Louisiana residents spend about $698 per year per person for saltwater fishing. That's about $168 million a year expenditures in saltwater equipment, gear, trip expenses and other things like licenses. These figures suggest that most saltwater fishing is done by recreational fishermen who live in Louisiana. Determining the number of commercial people who are involved in saltwater fishing would be more difficult because Louisiana licenses gear, vessels, and the individual. A lot of people are multi-licensed. We do know that in 1991 there were about $270 million of dockside value in commercial fishery landings. Does that mean that the value of the recreational fishery is smaller than the commercial fishery? No! The biggest number is not always the actual factor you need. In this case, the expenditures for saltwater angling are basically made at the retail level but the $270 million dollars from the commercial harvest is taken at the base of the economic system, the first buyer. We are therefore comparing different types of fishing at different levels. It is important to remember that you must use economics carefully and compare similar figures for the same species or fishery.

Economic impact. People want to use economic impact numbers to allocate fish. The economics professional says that if we want to get to the importance of fishing, economic impact is not the way to go. Instead we should do what the federal legislation, the Inspector General, and economists recommend: maximize benefits as opposed to the cost of harvesting or pursuing fish. In other words, you have to do a cost benefit study to make public policy and fisheries allocation decisions.

This means use economic value to measure the importance of things. Economic value is simply the difference between the benefits of a certain policy decision versus the cost of that policy decision. What we want to do is maximize that difference. We want to make two lists — the costs of a policy and its benefits. By comparing these lists, we get the net benefits which is not the same as the economic impact. Generally, you can take the net economic value and run it through an economic impact model to find out who benefits and who loses — the distributional aspects of an allocation.

But there is something new on the horizon in terms of the importance of coastal fishing. All of the public policy decisions in the future will include identifying and acting on the social impacts or aspects of any policy alternative. Economics alone is not going to determine fishery policy. We all need to become familiar with a whole new set of things in order to be able to effectively argue the importance of any fishing policy alternative. This is especially important on the federal level.

Keep in mind that social aspects include the fishermen and their dependent communities. Know and gather hard data on the fishermen from sociological and anthropological standpoints, and on their dependent communities. Decisions on the fisheries in the future won't be argued only on biology, or economics. Allocation decisions and policy alternatives are going to be based also on social factors.

But remember, whether they be economic, biological, or social, at the federal level your reasoning must be based on the best scientific information available. Even the state's finfish policy standards require the best scientific information available as the criterion for making a policy decision.

In the future, management will probably be synonymous with allocation. People recognize there has to be some kind of short term sacrifice to get some long term value from the resource. Keep in mind that allocation can be within as well as between user and resource groups. For example, we have people with skiffs that want small shrimp and people with big trawler investments that go offshore to catch larger shrimp. Over the years, this second group may have to move closer to shore because of excessive competition inshore. In this case, the resource has to be allocated among people within the overall commercial user group. Allocation is not just between commercial and recreational user groups. Future management decisions will include social as well as biological and economic factors which must

be gathered scientifically. We must become familiar with these factors, learn how to participate on task forces and advisory panels, and learn how to testify at public hearings. In other words, all users must learn how to play the game by the rules. It's important to our future.

Can You Live With Change

by Jerald Horst
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I really had to struggle with this topic. Seventeen years as an extension fishery agent should have prepared me to speak about this because one of the things that extension fisheries agents do is promote change. We promote moving away from status quo and toward making things better. I'm used to speaking about technical subjects such as about biology of a species, what's happening to it, what you can expect and how you can react to these changes. Very seldom do I have to speak about change per se. While I think I have a lot of ideas, articulating them is very difficult for me. I was asked to not hold back, to be challenging. If I say something in the course of this presentation that pinches your shoes a little bit, I hope you don't take it too hard, but do take it seriously because in 17 years I have seen some things concerning change in our fisheries in the state of Louisiana which perturb me.

Like any speaker delving a bit outside of his field, I went to the dictionary first to look up the definition of change. The American Heritage Dictionary's definition of change is "to be or cause to become different." The English poet Abraham Crowley said, "The world is a scene of constant changes, and to be constant in nature is constant." And Ralph Waldo Emerson said, "Revolutions never go backwards." (Revolution is what change is all about.)

Let's look at change — can you live with the changes and the revolutions occurring in Louisiana's coastal fisheries? No doubt, change is frightening, and the older we get the more resistant we are to change. When I asked a fisheries leader what he thought about change, he said "Jerald, I think change is really good so long as it happens to someone else". In fisheries a lot of people are trying to make change usually to other people's lives rather than to their own. People would rather see somebody else change for their benefit than make the change themselves.

What is changing? Our values, a fundamental part of our society, have changed. People today have a variety of views about abortion, gambling, and living together outside of marriage. Communications have changed dramatically. Ten years ago I didn't know what a fax was, now I can hardly live without one. When someone calls me for information, he or she doesn't want me to send it, he or she wants me to fax it. People want instant gratification. Technology affects the way we do things. Computers do everything, even participate on commercial fishing vessels. Cars adjust themselves as they turn corners.

Changes in fisheries have likewise been very dramatic. Fishery management now considers more than the biology, the habitat, and the resource. They listen to the special interests of lobbying groups. These management decisions have had a large impact on both commercial and recreational fisheries in the last 15 years.

Fishery changes have been especially hard on the commercial fishery. Aquaculture has caused a revolutionary change in the way that we harvest and sell Louisiana's commercial fish products. Aquaculture has taken and will continue to take a large portion of the market share that commercial fisherman have traditionally relied on for their living. Can the commercial fishery adjust to that? Some fishermen have adjusted by working another species: crabbing instead of catfishing, for instance.

Imports — seafood has become truly a world commodity. Shrimp are traded on the commodity exchange in Minneapolis. The number one air cargo in the city of New Orleans is seafood primarily from Latin America, much of it very cheap. The crawfish industry recently protested the price changes that are occurring because imported Chinese crawfish are marketed at half the price of our domestic supply. I anticipate imports will become even stronger as we become a smaller and smaller world.

Restrictive management will increase for both recreational and commercial fisheries. Limits are the largest change for recreational fishermen. But for a commercial fisherman, limits can be devastating. When the average fisherman of today grew up, his father fed his family by fishing red snapper 12 months a year. Today he can only fish snapper three or four months of the year. Restrictive changes like these are going to continue to increase.

Environmental change in the commercial fisheries is probably the most underrated change for the future. We have to recognize that an increasing segment of society values marine resources and fisheries products, not just because they are valuable, fun to catch, and good to eat, but also because they exist. For example, this group does not value the excitement of catching or eating a large fish, or selling the catch. These persons want to preserve whales even if they had never seen or caught one, just to know they are there. Some believe this same value about sea turtles led to the imposition of TEDs. This TED issue has really turned the fishing industry upside down, especially the shrimping industry (the largest commercial fishery of Louisiana). TEDs have demoralized it more than any other single thing that has happened since I have been on this job.

The commercial fishing industry has felt strong recreational competition, most currently in the case of redfish. The competition for speckled trout has not been quite as heavy. In the case of redfish, commercial fishermen have lost all access to the resource. They don't even have a right to go out and catch five redfish with rod and reel if they have any sort of commercial gear on their boat. This big change has impacted a lot of people.

The competition between commercial fishing groups is intense and likely to become more so as they are squeezed by the people, the regulations, and the changes around them. This competition is not just with the people in their own fishery. When people are squeezed out of one fishery, they get into another, which further exacerbates the situation. Competition between commercials is especially serious. That has been a huge change. The competition between commercials is very intense and likely to become more so as they are squeezed by the people around them, by regulations, and by the changes around them. They want to make a living somehow, so they compete with their own counterparts.

The recreational fishery has yet to see its biggest changes. One of the first things that the recreational fishing industry in coastal Louisiana has to face is the loss of a great deal of access to the waters they traditionally fish. Canals are closed off. As our wetlands erode, what we think of as fishing grounds deteriorate and may not be available for fishing. This may have a very dramatic impact upon recreational fishing.

The humane movement has an agenda that is different from yours. It's not a bad agenda, I'm not criticizing it. This group's value is preserving life. To them, fishing and killing are not recreation. Nothing should be caught or killed except to secure food to eat. And some don't even believe feeding one's family is a good reason to catch and kill fish. Catch and release may also bring the recreational fishery more heat than you can ever imagine. Polls have shown that the American public only approves of hunting because hunters eat what they take. As society changes, I suspect that this group will object to catching things with hooks, with barbs, yanking them out of the water and throwing them back and enjoying it. Remember that the nonconsumptive user is playing an increasing role in fisheries regulation.

Commercialization of the recreational fishery is another change and challenge. This can also be called fishing for money — tournaments. Some of the supporters of this movement say bass should be caught only for a prize, and then released to grow some more. They are too valuable to eat. How is this going to impact the future of recreational fishing?

Hostility between fishery user groups is already apparent. Should recreational and commercial fisherman bequeath this hostility to their children? Friendliness used to be universal on the water. An angler could get shrimp bait from a nearby commercial fisherman. The offer to pay for the bait was never accepted. Instead of taking the money they handed you a water bucket of shrimp. Today the average

recreational fisherman is probably scared to pull up to a commercial boat and ask for bait, and the average commercial fisherman probably wouldn't sell it. In this hostile atmosphere, recreational and commercial fishermen are not helping one another with emergencies on the water either.

And finally, massive changes are going to occur in our habitat during restoration of Louisiana's coastal wetlands. The habitat produces and sustains the fish. With the Breaux Bill funds set aside for wetland restoration, fresh water will fill some saltwater or brackish water areas. Fishermen will have to relocate to find their species. And I don't mean that from a negative viewpoint. We as a society have said the productivity of these wetlands fifty years from now is worth today's sacrifices.

Change causes conflict and conflict causes change. Conflict is something we increasingly see in fisheries. The two basic types of conflict are value conflict and interest conflict. Value conflict occurs when the belief system or values of the people within a group are dramatically different. For example, people that fish for a living very frequently say,"God put these things here on earth so that I can make a living from them. The resource is important for me to feed my family." People that fish recreationally say the resource should not be exploited or sold. Values aren't right or wrong, they're just different!

Interest conflict is pretty self evident. Self-interest is the primary management guideline. These aren't always actual conflicts; they can be perceived conflicts, but, in life, perception is reality. These are serious by themselves, but they may evolve into a third form of conflict: relationship conflict. Negative emotions and hate are involved. Reason is absent from this form of conflict, making it very difficult to resolve. You people are attending because you are identified as leaders. You need to prevent your feelings toward the people you deal with from degenerating into relationship conflicts because these involve emotion. Emotion does something that upsets me as a scientist. It causes management of fisheries by opinion and emotion rather than management by good science.

What causes change? Some things just happen; they don't come from any identifiable, controllable source. We mentioned that society's values change. The environment and the biota change. We know the sea level is rising but we can't do a thing about it.

Commercial and recreational fishermen can affect some of the other causes of change. These sources or vectors of change will change the way recreational or commercial fishing is done if they don't have a hand in change. The first vector, government, can change fishing through the management of fisheries. Government has already changed the fishery by setting limits on who can fish, when, and for what. So far, government has used biology to make management decisions; but social reasons could become another factor carrying equal weight.

Market values are a second vector. Aquaculture can skew the value of fresh caught seafood. Imported aquacultured shrimp are glutting the market and depressing prices. The demand for the recreational dollar might make fishing waters more valuable to other industries like gambling boats or tourism. Other people trying to make money are going to influence Louisiana's fisheries in the future.

Third, as mentioned earlier, the environmental movement is going to play a very strong role. It's going to cut across all commercial and recreational lines. If commercial and recreational fishermen become involved, this movement could unite these two fishery user groups. Lastly, are other fishing groups and by that, I mean you. For commercial fishermen, the "other" group is recreational; for recreational fishermen, the "other" groups are commercial.

These four vectors of change should be remembered. They will change your fishery: government, market forces, the environmental movement, and other fishing groups. None of those four major vectors of change have your personal interest at heart. They have their own agenda. If you don't step forth as leaders and attempt to make some changes, these people will change your fishery beyond recognition.

Basically you have three roles that you can use to approach change.

1)You can watch it happen to you. Typically, those who choose this role wind up bitter, with no control over their destinies.

2)You can react to change caused by others. You can indeed change the way you do business or the way you fish in reaction to forces that other people have caused.
3)You can become part of change. You can get out front and lead the change to better the fishery and direct its future.

Now you are here because you are leaders. (But I'm going to say something that might offend you.) For 17 years I've watched the way the recreational and commercial leadership in this industry motivates followers to be involved in "bettering the fishery." I'll give you an example from the recreational leadership first: I asked a leader of a southeast Louisiana recreational group, "Why do you keep beating on commercial fishermen when there are so many other dramatic things that are impacting your future — wetland degradation, loss of access —?" His answer shocked me. He said," Jerald, I tried all that. And, I really believe in the importance of my organization and I want it to be around in the future. Nothing recruits people like hanging up a dirty, old, snaggle-toothed commercial fisherman and beating on him with a stick." That is negative motivation. A commercial example: I have heard the rallying cry among the commercial fishermen, "Come join my group and help us fight change. We've got to stop the government from making changes." I've seen it in statewide organizations and local ones. Why did those of you in the commercial sector join a commercial fishing group? It was always to fight off change — by government, or an interest group. How many of you have ever joined a group to make a change that would better your fishery?

To lead in this manner, you have to be positive, not negative, which is difficult. It is easy to rally people together against something (like TEDs) or for a negative cause. It's harder to figure out a new approach and convince others to try it too. Rallying people around a negative cause is really fighting off change. When you fight this way, the best you can do is break even. You'll never win.

I challenge you first to decide who you are vis-a-vis change. What you are, what is your role in change? Are you a watcher, the guy who is just going to watch stuff happen and end up bitter? Are you a reactor or survivor, who adapts and adjusts to things that other people do? Or are you a leader, who figures out a new method and convinces others to do the same? Second I challenge you to act in justice. Everyone has to be considered. Are you rallying people against competitors for the resource unnecessarily? Are you doing it for your own ego gratification? Or if you are rallying your people to your cause, are you really leading them to a better future or are you just leading them to fight change to keep the status quo. I'm convinced that there is a segment of people that have exchanged the hobby of fishing or the vocation of fishing for the interest or activity of the politics of fisheries management. A leader works for a better future. As Sir Francis Bacon said, "He that will not apply new remedies, must expect new evils." To live with change, each of us has to be part of it.

Marine Fisheries Management: Your Fish/Your Challenges

by Dr. Andrew Kemmerer
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Enactment of the Magnuson Act in 1977 brought with it a tremendous increase in federal responsibility for the management and conservation of fishery resources off the coasts of the United States. It was implemented initially to control foreign fishing off of our coasts, but it has major implications for our own fisheries. This act extended U.S. jurisdiction from 12 miles to 200 miles from our coastline so that jurisdiction now covers more than two million square miles. At the federal level, the Congress assigned lead responsibility for management and conservation to the National Marine Fisheries Service (NMFS), an agency within the National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce.

All marine resources within U.S. jurisdiction are the common property of the nation — they do not belong to one group or another. They are held in trust for present and future generations, partly by individual coastal states and partly by the federal government. The purpose of this presentation is to briefly describe how the federal process works, with special emphasis on the need for public involvement.

The purposes of the act are to conserve and manage fisheries resources off the coast of the United States, to support and encourage international agreements, to promote commercial and recreational fisheries, and to provide fisheries management to achieve optimum yield. That is the maximum sustainable yield, the maximum yield that you can expect from a fishery resource over time, adjusted for social and economic factors. These latter two factors will be given increasing emphasis over the next few years.

Regional Councils

Eight regional councils were established by the Magnuson Act to ensure regional involvement in the plans and amendments for managing priority fishery resources. It is through these councils that management is really accomplished.

The composition of the councils includes persons knowledgeable about the fisheries and marine resources of the regions. Voting members include an obligatory member from each state, at-large members, the fisheries director or designee from each state, and the NMFS regional director. The obligatory and at-large members, selected by the Secretary of Commerce from nominations provided by the state governors, serve three-year terms. Non-voting members include representatives from the U.S. Fish and Wildlife Service, from each state commission (e.g., Gulf States Marine Fisheries Commission), U.S. Coast Guard, and the U.S. State Department. Cooperation with the states, built into the council structure, is necessary for the fishermen and the fish. Besides the variety in state jurisdictions (e.g., from three miles in Louisiana to nine miles in Florida), many species move during their life cycles between state and federal waters.

The primary responsibility of the councils is determining which fisheries need management. Once this is accomplished, they are then responsible for preparation of fishery management plans and amendments. In developing these documents, the councils must adhere to the Seven National Standards of the Magnuson Act, and other applicable policies and guidelines. One of the most important of these is that plans must be designed to produce optimum yield from affected fisheries. Optimum yield is defined as that amount of fish which will provide the greatest overall benefit to the nation with regard to food production and recreational opportunity. Another is that the plan must be based on the available scientific information.

Each fishery management plan or amendment must be based on specific requirements that serve to satisfy the Magnuson Act and a host of other federal mandates. For example, the plan or amendment

MAGNUSON FISHERY CONSERVATION AND MANAGEMENT ACT

Purposes:

- ✓ **Conserve and Manage Fishery Resources off the Coasts of the United States**
- ✓ **Support and Encourage International Agreements for the Conservation and Management of Highly Migratory Species**
- ✓ **Promote Domestic Commercial and Recreational Fishing**
- ✓ **Provide for Fishery Management Plans to Achieve Optimum Yield from Each Fishery**
- ✓ **Establish Regional Fishery Management Councils to Develop Fishery Management Plans With Extensive Public Participation**
- ✓ **Encourage Development of Underutilized Fisheries**

MAGNUSON FISHERY CONSERVATION AND MANAGEMENT ACT

Establishes 8 Fishery Management Councils:

- ✓ **New England (Maine Through Connecticut)**
- ✓ **Mid-Atlantic (New York Through Virginia)**
- ✓ **South Atlantic (North Carolina Through Florida)**
- ✓ **Caribbean (Virgin Islands and Puerto Rico)**
- ✓ **Gulf of Mexico (Texas Through Florida)**
- ✓ **Pacific (California Through Washington and Idaho)**
- ✓ **North Pacific (Alaska Through Oregon)**
- ✓ **Western Pacific (Hawaii, American Samoa, Guam and the Northern Mariana Islands)**

FUNCTIONS OF REGIONAL COUNCILS

Defined by the Magnuson Act as:

- ✓ **Prepare Fishery Management Plans and Amendments**
- ✓ **Comment on Foreign Fishing Applications**
- ✓ **Conduct Public Hearings to Allow Interested Parties to be Involved in the Development of Fishery Management Plans and Amendments**
- ✓ **Provide Reports to the Secretary**
- ✓ **Review Status of Fisheries on a Continuing Basis**
- ✓ **Conduct other Activities Required by the Act**

REGIONAL COUNCIL MEMBERSHIP

Voting Members:

- ✓ **State Fishery Directors**
- ✓ **Obligatory Members (~~Selected~~ Nominated by State Governor)**
- ✓ **At Large Members (~~Selected~~ Nominated by State Governor)**
- ✓ **NMFS Regional Director**

NonVoting Members:

- ✓ **U. S. Fish and Wildlife Service**
- ✓ **Coast Guard District Commander**
- ✓ **Marine Fisheries Commission**
- ✓ **Department of State**

COUNCIL COMPOSITION

Each Council is Authorized to Form:

- ✓ **Scientific and Statistical Committee**
- ✓ **Advisory Panels**
- ✓ **Ad hoc Panels and Advisory Groups**
- ✓ **Committees**

Each Council is Supported by:

- ✓ **Executive Director and Staff**
- ✓ **NOAA General Counsel**

SEVEN NATIONAL STANDARDS

Fishery Management Plan Measures Must:

1. **Prevent Overfishing While Achieving Optimum Yield**
2. **Be Based on Best Available Scientific Data**
3. **Manage Individual Stocks as a Unit**
4. **Not Discriminate Between Residents of Different States**
5. **Promote Efficiency in Resource Utilization**
6. **Take into Account and Allow for Variations Among Fisheries**
7. **Minimize Cost and Avoid Duplication**

must include full descriptions of affected fisheries, a discussion of recommended management measures with considered and rejected options, a regulatory impact review (to examine impacts of proposed management measures on people in the fishery), an environmental assessment or environmental impact analysis (to look at effects of the fishery and proposed management measures on the environment), an assessment of the impact of the plan or amendment on state coastal zone programs, an evaluation of the impact of the plan or amendment on endangered and threatened species, and there's more.

Fishery management plans of major interest in the Gulf of Mexico include reef fish, coastal migratory pelagic resources, red drum, shrimp, spiny lobster, stone crab, coral and coral reefs. Other plans with directly impact the Gulf Fisheries, but are not under the purview of the Gulf Council, include the Atlantic bill fishes, Atlantic swordfish, Atlantic sharks, and Atlantic tuna. NMFS handles these latter plans directly as a result of 1990 amendments to the Magnuson Act, but the plans are being redefined and updated in cooperation with affected fishery management councils.

Public involvement, a key component of fishery management plan development and amendment, is done in a variety of ways. Each council is supported with a scientific and statistical committee to insure that the plans and amendments are based on the best available scientific information. The members of this committee are normally from universities, and state and federal agencies. Additionally, each council has advisory panels composed of people knowledgeable about particular fisheries, including representatives from commercial and recreational fisheries. Normally, the development of any management plan or amendment is initiated with public scoping meetings where the public is asked to comment on the need for management and on possible management measures. Once a plan or amendment is developed to the point of specifying management measures, the public is invited to comment on the plan in writing and through public hearings held in areas near the fishery (i.e., near the people most affected by any proposed amendment measure).

Each regional council is supported by an executive director and a staff. These people develop the documents that are used for public hearings and for the councils' decisions. All of the councils publish a newsletter that reports on the current regional planning activities. It is important that the people in the fisheries, especially those who are financially dependent on the fisheries, get on the mailing lists for these newsletters. The following four pages summarize the council structure.

Secretarial Review

Once a fishery management plan or amendment has been completed, it is submitted to the NMFS Regional Office to begin review by the Secretary of Commerce. He is severely constrained in the review, however, because the Secretary can only accept or reject portions or the entire plan or amendment. He cannot change it. This review is limited to a tight, 140-day schedule. Because of the importance that the Magnuson Act places on public involvement, this schedule includes 45 days of time for public review and comment. This comment period begins 15 days after the plan or amendment is received by NMFS with publication in the Federal Register. Because many people do not regularly read the Federal Register, summaries and instructions on how to obtain copies of the complete document are widely distributed.

Every comment received by NMFS during the public review and comment period is considered and commented upon when the final plan or amendment is published. This normally occurs 110 days after the plan was first received by NMFS. The plan becomes effective 30 days after publication, on day 140.

Forming a Plan or Amendment

The steps through which a plan or amendment pass are outlined on the following five pages. A plan is the basic document for managing a particular fishery; an amendment is an update of the plan to accommodate changing conditions.

A management need can be identified by a number of sources — concern expressed by fishermen, for instance, that the fish are too small. That need is then reviewed by the council based on what-

SUMMARY OF STEPS THAT MOST PLANS AND AMENDMENTS FOLLOW

1. **Management Need is Identified**
2. **Management Need is Reviewed by Council**
3. **Public Scoping Meeting**
4. **Council Decision for Action**
5. **Scientific Data Collected and Presented to Council**

SUMMARY OF STEPS THAT MOST PLANS AND AMENDMENTS FOLLOW

6. **Council Committee Develops Plan or Amendment in Consultation with Advisory Panels and Scientific and Statistical Committee**

7. **Council Approves Public Hearing Draft**

8. **Public Hearings, NMFS Informal Review, and SSC and Advisory Panel Reviews**

9. **Public Comments Reviewed and Modifications Made**

10. **Council Final Approval and Submission to Secretary of Commerce**

REVIEW BY SECRETARY OF COMMERCE

Limitation: **Secretary can only Approve or Disapprove Parts or all of the Rule. The Secretary cannot Change or Modify the Rule**

Day1: **Begin Formal 95-Day Schedule, Notice of Rule and 60-Day Comment Period Begins**

Day15: **45-Day Public Comment Period Begins**

Day95: **Council Notified of Approval or Disapproval**

Day110: **Final Regulations Filed in Federal Register**

Day140: **Rule Becomes Effective**

OPPORTUNITIES FOR PUBLIC INVOLVEMENT

- ✓ **Council Membership**
- ✓ **Advisory Panel Membership**
- ✓ **Public Scoping Meetings**
- ✓ **Public Hearings**
- ✓ **Written Comments**
- ✓ **Attendance at Council, Advisory Panel, and Committee Meetings**

------ THE COUNCIL PROCESS IS PUBLIC ------

ever information they may have at that point. A decision is made as to whether or not they should go forth. If the decision is made to go forth, generally the next step is to have public scoping meetings in all areas that are being impacted by the fishery or by that resource. These are very informal meetings to try to determine if is there a problem, and what the magnitude of the problem is. The council must again decide, based on the results of those scoping meetings, whether or not to move ahead. If the decision is affirmative, a rigorous data collection and analysis effort is conducted and then those data are presented to the council. The council then will assign that activity to a subcommittee of council members to develop a draft plan or an amendment that addresses the particular problem and includes the data. That is done in consultation with the advisory panel or the effected panels. For example, a draft reef fish amendment will be passed through the reef fish advisory panel and also through the scientific and fiscal committee before the draft plan is presented to the council. The council then will review that plan and select management options. The plan then goes to public hearing— a key part of the plan development process. Those public hearings have to be held in areas of residence of those who would be affected by the management proposal. The results are written into a formal document which the regional council submits to the Secretary of Commerce. He has only 140 days to complete the process as mentioned above. This process looks long and cumbersome, but it is necessary because it has to involve the public. Normally, this process takes about 8 months to get from step one to step 10. Maybe a year even.

In Conclusion

Fishery resources under federal and state jurisdiction and management are a public resource. The Magnuson Act spells out how federal fisheries management and conservation is supposed to function. It is a public process through regional fishery management councils. This process will not work without public involvement. The fishery resources are yours; they represent your challenge. It won't work unless you are involved.

Understanding the Terms and Science of Fish Management

by John Roussel
Louisiana Department of Wildlife and Fisheries

Successful management of fisheries is a complex process which includes at a minimum a mixture of biology, economics, sociology, ecology, law, politics, and the decision and management sciences. All of these disciplines are important, and good fisheries management is the result of decisions which incorporate a balance between disciplines. Nevertheless, scientific advice regarding the biological effects of fishing on a fish stock forms the basis for fishery management decisions. This advice is often presented in a highly condensed and technical form. The proper use of this advice requires an understanding of the basic fundamentals of fish population dynamics and the effects of various management alternatives. It is important that everyone involved in the fishery management process (decision makers) as well as those affected by it (harvesters and industries dependent on the harvesters) understand the scientific basis of management decisions.

Fish stocks are not visible in the usual sense of the word. Their biological assessment must be made by indirect means requiring varying amounts and types of scientific data. Two basic types of quantitative data are collected — Fishery dependent data directly from the harvesters at the dock, and fishery independent data from samples taken by resource management agencies using standardized sampling gear. All of these data are used to construct mathematical models which quantitatively represent the major forces affecting the biomass of a fish population. These data are also used to make quantitative predictions about the reactions of fish populations to alternative management choices.

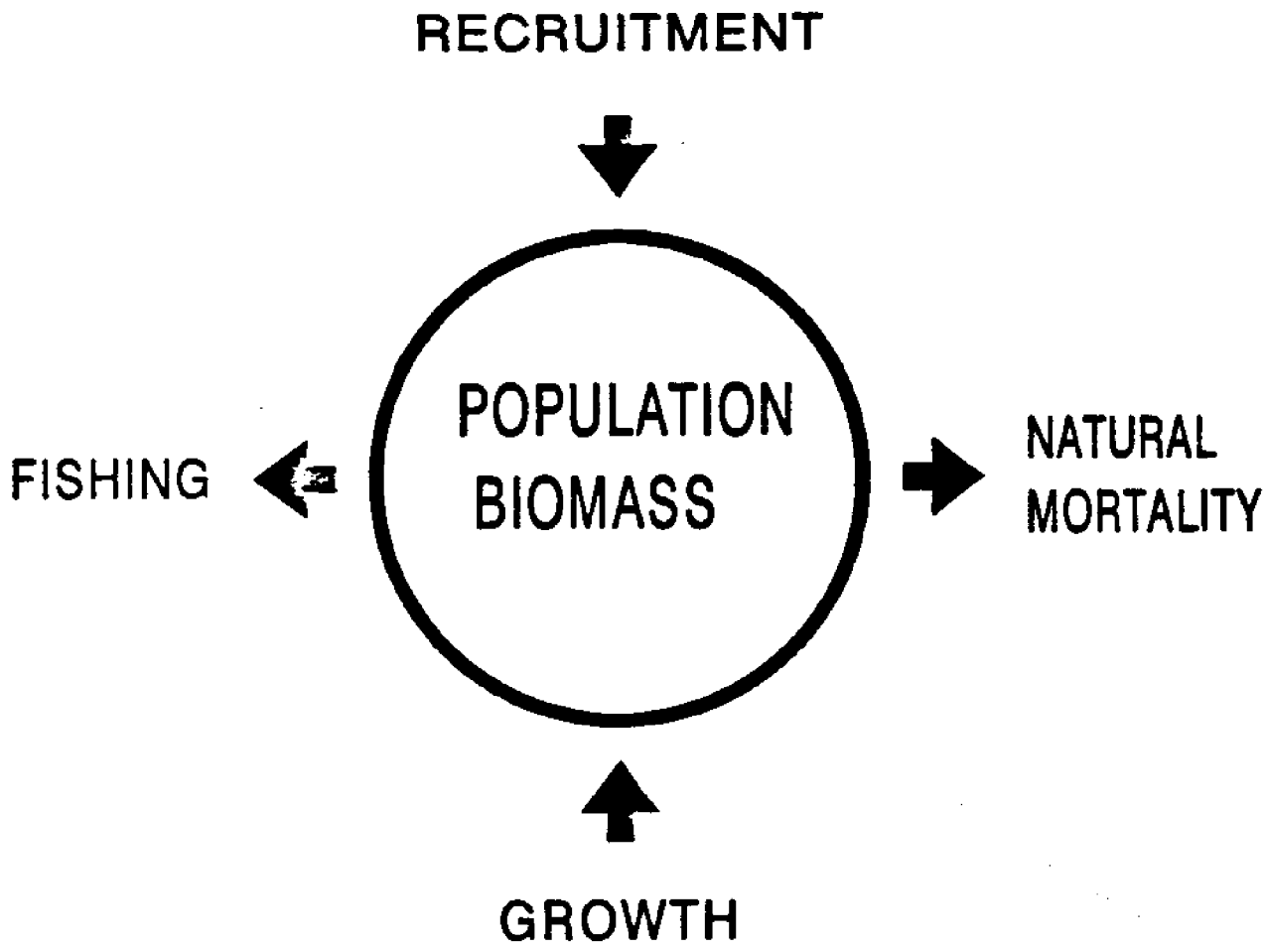
An overview of the basic fundamentals of fish population dynamics is presented using a series of diagrams which follow these descriptions:

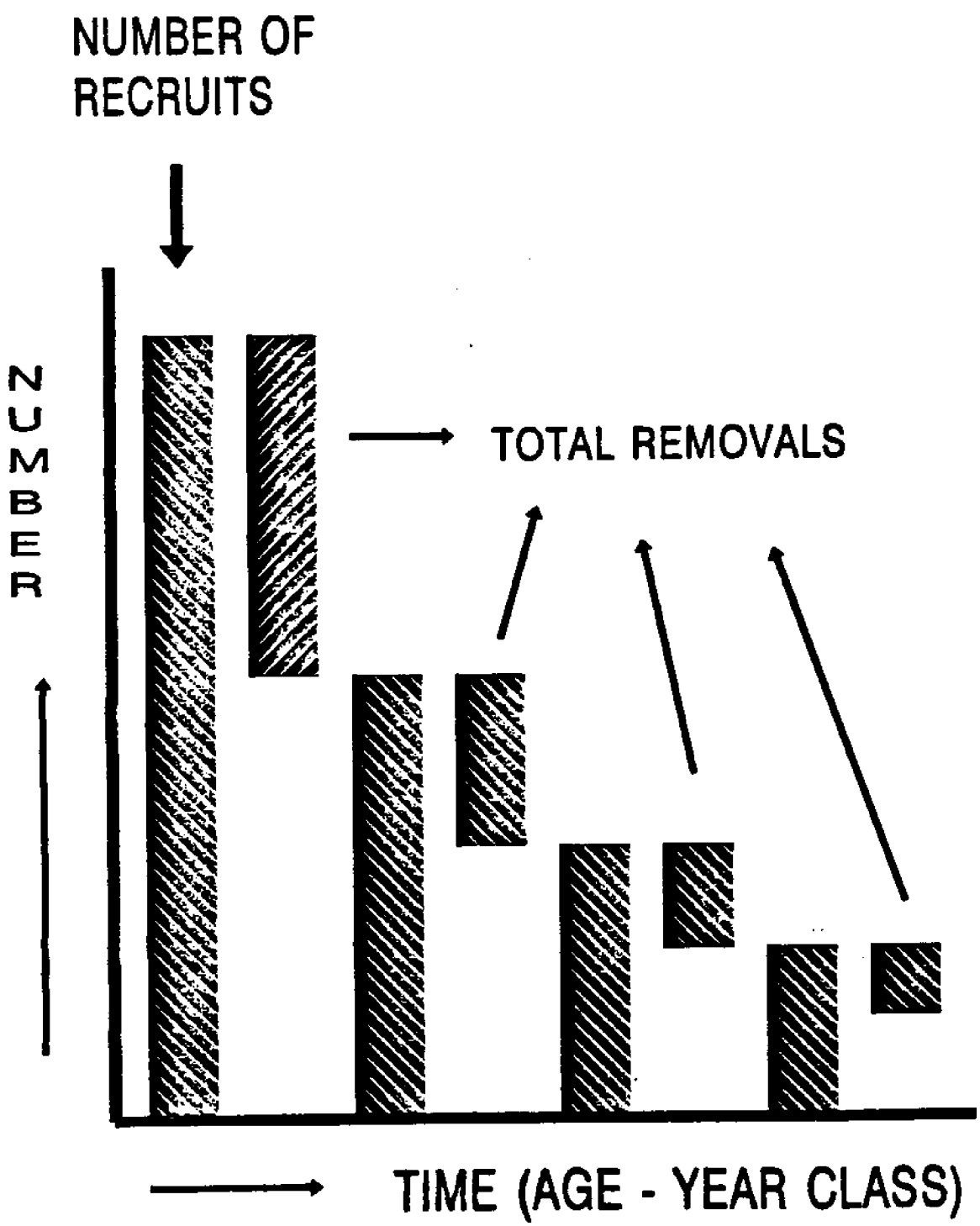
(Diagram #1) Various conceptual and mathematical models are used to explain the dynamics of a fish population. There are four major forces affecting the biomass of an exploited fish population which, together, represent what can be called a fundamental model of fish population dynamics. These four forces are (1) growth, and (2) recruitment (which both tend to increase the size of a fishable population biomass), (3) fishing, and (4) natural mortality (which both tend to decrease the size of the biomass). If growth and recruitment exactly balance fishing and natural mortality, population biomass remains the same.

(Diagram #2) All of the individuals of a given species born within a given period (usually a year) are lumped together as a year-class. For instance, all of the redfish born in the Gulf of Mexico in 1992 are in the same year-class. The number of individuals in a given year-class will be the highest in the first year of life (the far-left bar onthe graph). After four years, a comparatively few number of the year-class are left (the far-right bar). The difference between the numbers present at successive ages represents the number of fish removed by fishing and natural mortality. Notice that if the rate of removal is constant the largest number of fish in the year-class are removed from the population in the first year.

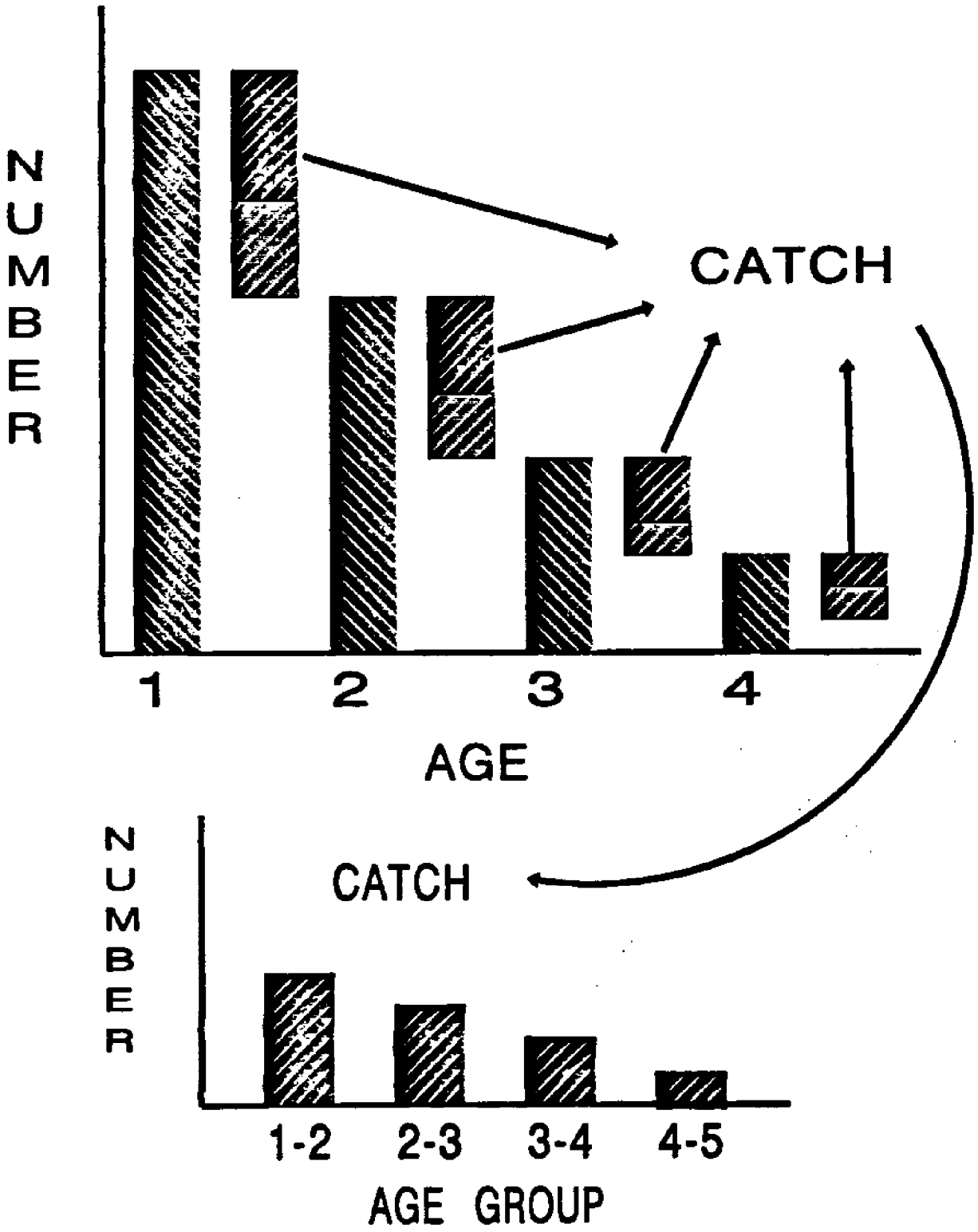
(Diagram #3) The graph at the top of this page duplicates Diagram #2, but the bars delineating the proportion of fish removed from the year-class in a particular year are divided into those removed by fishing and those removed by natural mortality. The graph at the lower part of this page shows the proportion of the year-class removed from the fishery through harvest. In this example the rate of removals (both naturally and by fishing) is held constant but note that the number removed decreases as the size of the year-class decreases.

(Diagram #4) Growth is really the production of biomass by an individual fish as it grows older. This graph shows the changes in the rate of biomass production for an imaginary species, the diamond fish. Note the slow increase in weight during the first year, the more rapid increase during the second and third years, and then the slower increase after age three. This change in rate of growth is important to


RECRUITMENT
POPULATION BIOMASS
FISHING
NATURAL MORTALITY
GROWTH


NUMBER OF
RECRUITS
NUMBER
TOTAL REMOVALS
TIME (AGE - YEAR CLASS)

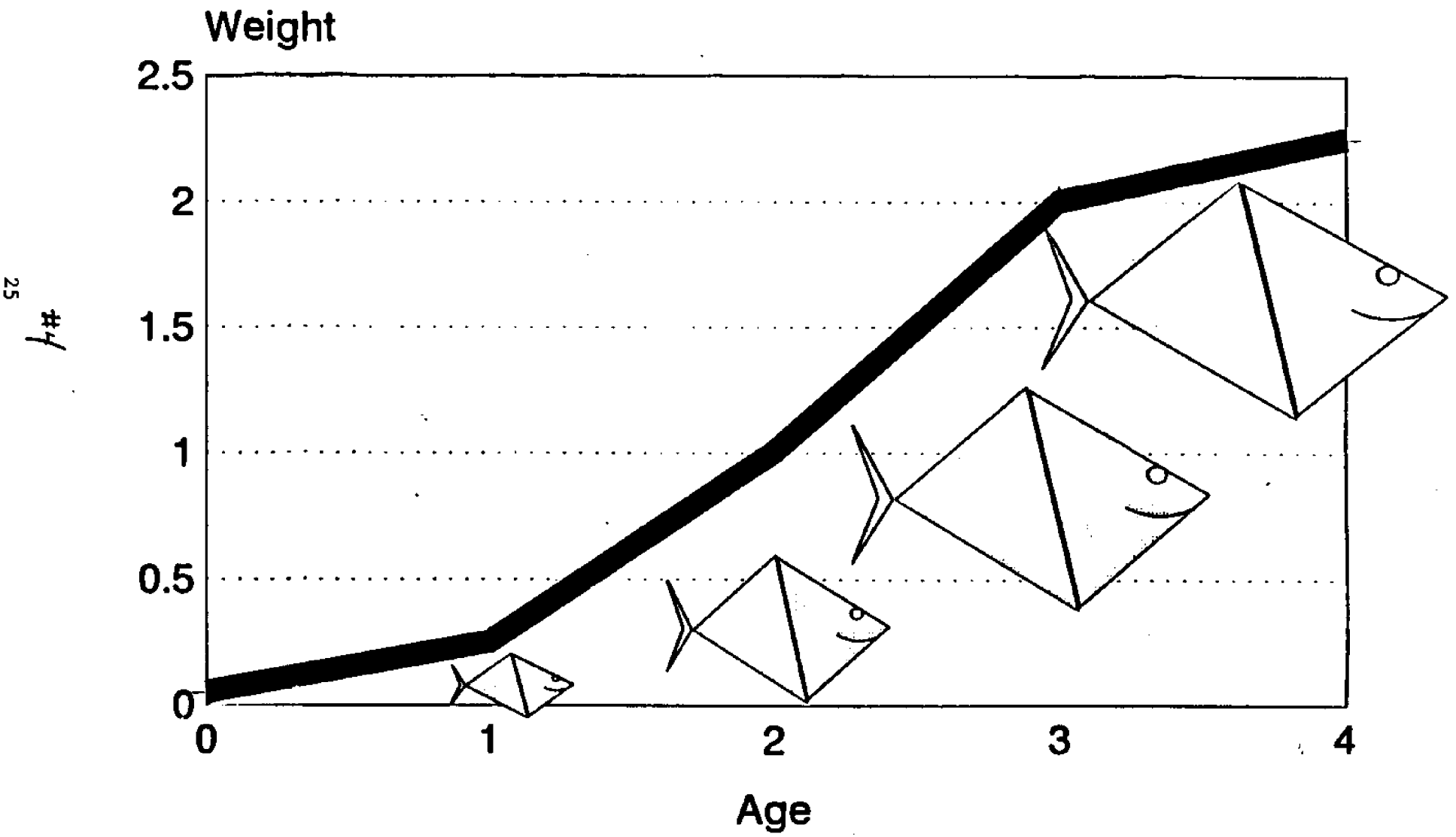
#2



#3

Age and Weight of Diamond Fish

in Louisiana



fishery management when it is considered in relation to the change in year-class numbers over time.

(Diagram #5) This graph shows the spawner-recruitment relationship. The largest spawning stock (biomass) is not necessarily the one that will produce the most eggs. The line labeled Ricker in this diagram shows that as spawning stock increases, more young are produced up to a point, but beyond that point the numbers of young produced actually decreases because of competitive factors such as the young being eaten by the older, bigger fish. The line labeled Beverton and Holt demonstrates a similar relationship but rather than the number of young produced decreasing beyond some point, it simply levels off. The important fishery management consideration with spawner-recruitment relationships is not to reduce the spawning stock to a level where the number of young produced is reduced.

The next three diagrams will show the effects of these factors operating on a population simultaneously:

(Diagram #6) The five factors listed under Life History Aspects of an Imaginary Fish are the primary facts about a species that are important to fisheries management. At the bottom of the page, the table provides a picture of the number of individuals at age and the weight of each individual at age. One can see that total biomass of a year-class (number of individuals x average weight) increases at successive ages up to a point but then total biomass decreases. In this example, the biomass decreases significantly from age three to age four. If you had the capability to harvest the entire year-class instantaneously and you wanted to maximize your harvest in weight, you would wait until the fish were three years old.

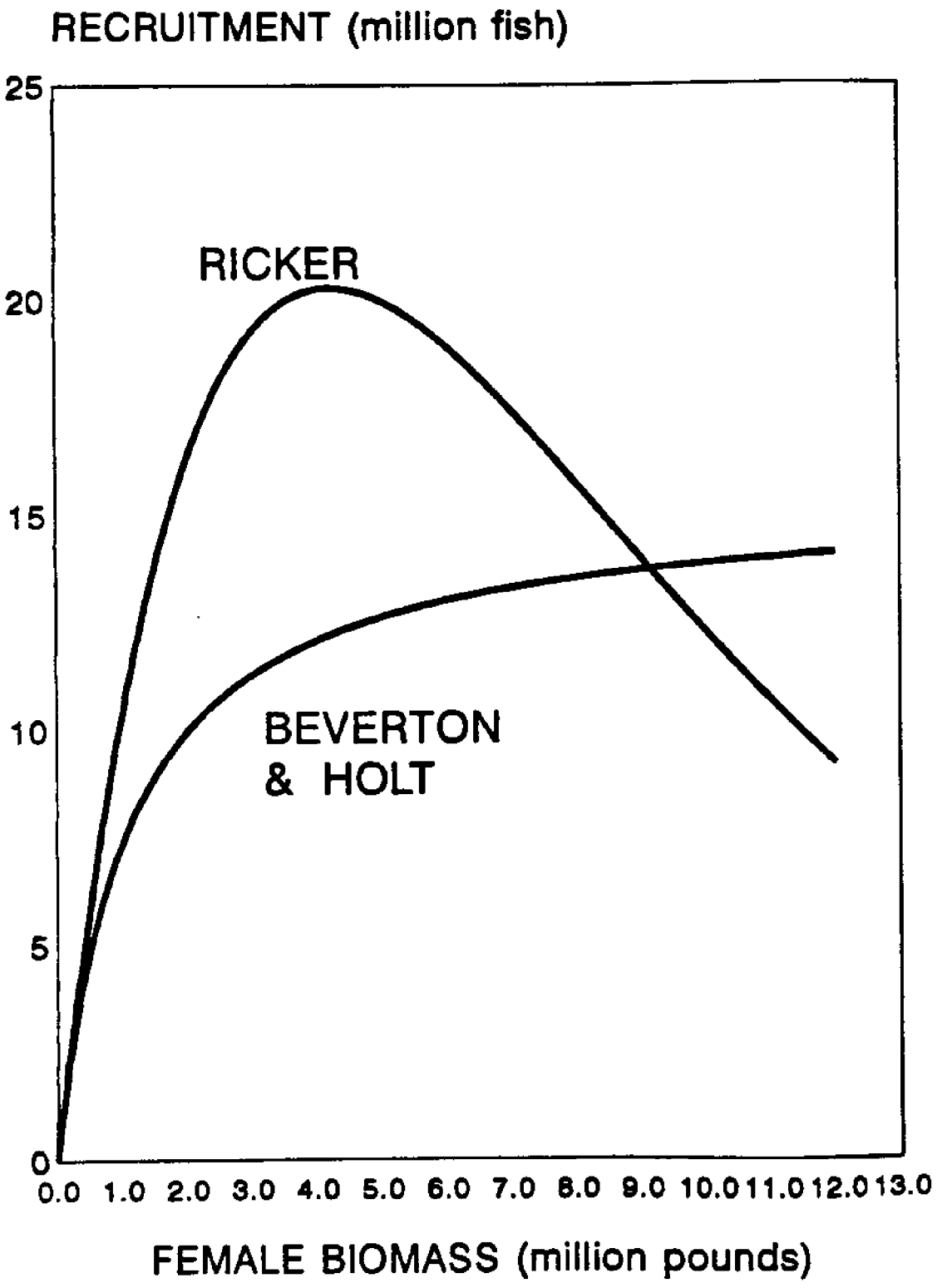
(Diagram #7) This is a diagram of a year-class of diamond fish over three years with a constant natural mortality rate and no fishing permitted. After three years of natural mortality, 60 individuals die naturally (25 during year 1, 20 during year 2, & 15 during year 3) and eighty pounds of spawning stock remain.

(Diagram #8) This is a diagram of the same year-class but with a fishery. In this example a fishing mortality rate slightly larger than the natural mortality rate is used. Fishing removes individuals from the population, however, it also competes with natural mortality. Because some of the fish taken in fishing are those that would die in that year, the actual number of mortalities from fishing is not a simple arithmetic increase over natural mortality. As you can see, with fishing, only 25 individuals die naturally (14 during year 1, 7 during year 2, & 4 during year 3) as opposed to 60 individuals with no fishing. The resultant population is reduced however. After three years of fishing as well as natural mortality, only 24 pounds of spawning stock remain (30% of what would remain if there was no fishery). The total catch by the fishery over three years was 63 individuals which weighed a total of 45 pounds.

A basic understanding of fish population dynamics allows an individual to evaluate the likely impact of various alternative management choices. The biological objective of fish management should be to ensure the renewability of the resource while providing benefits to society (usually expressed as some type of physical yield). Fishery regulations (alternative management choices) affect a fish population in one of two ways: by changing the *rate* of removals by fishing (fishing mortality), or by changing the *size* of fish removed by fishing.

Fisheries management is a dual process with both biological and non-biological goals. The biological goals are concerned with how much of the fish are available for harvest while ensuring a sustainable resource for future harvest. The non-biological goals are concerned with who gets to participate (directly and indirectly) in the fishery and what benefits are generated by using the fish population. If the rational utilization of fish stocks is to be the goal of future fish management, it will be necessary for both the management decision makers and the fishery participants to have a basic understanding of fish population dynamics and the effects of alternative management choices on a fish population.

SPAWNER/RECRUIT RELATIONSHIPS

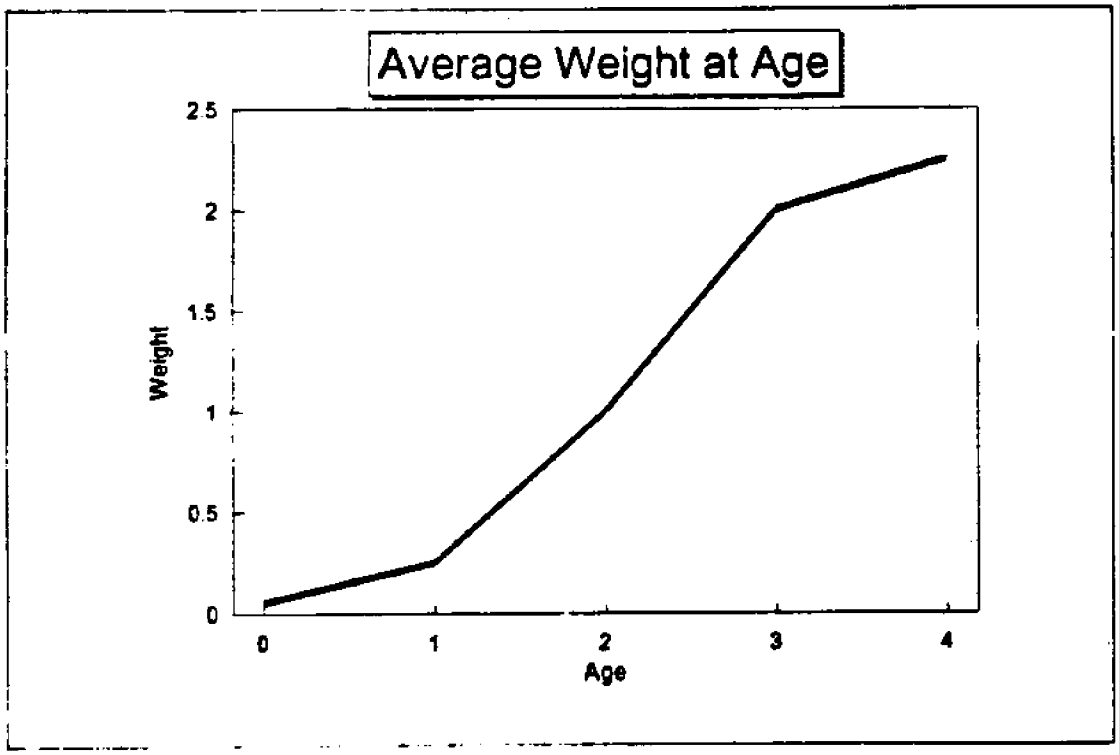


#5

Life History Aspects of an Imaginary Fish
(DIAMONDFISH)

1.) Natural Mortality Rate (M=0.3) = survival of near 75%
2.) Growth Rate given in table below

3.) Recruit to the fishery at 1 year old
4.) Mature at age 4
5.) Escape from fishery at Age 4, spawn and die after spawning



Yield Per Recruit of Diamond Fish

Age	Number of Fish	Annual Nat. Mortality	Average Weight	Biomass	% of Max. Biomass
0	100	26	0.05	5.0	6%
1	74	19	0.25	18.5	23%
2	55	14	1	54.9	67%
3	41	11	2	81.3	100%
4	30	8	2.25	67.8	83%

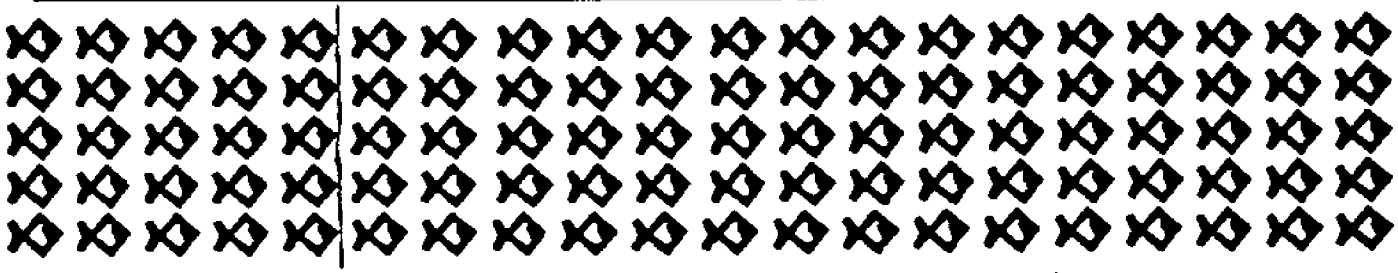
#6

MORTALITY

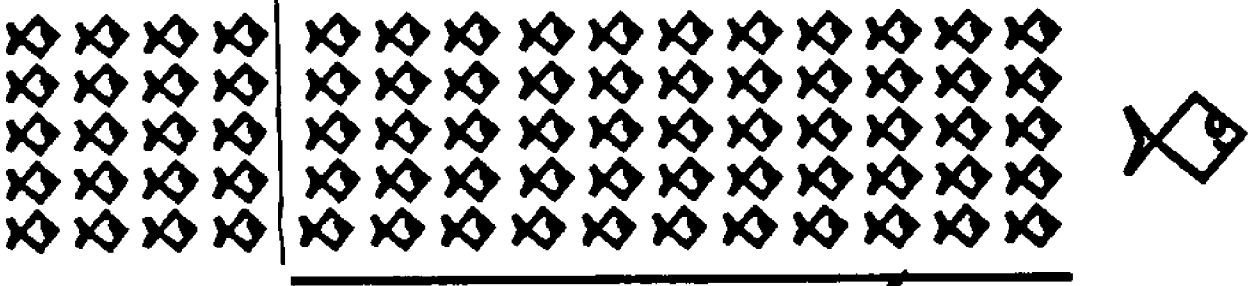
NATURAL

SURVIVAL

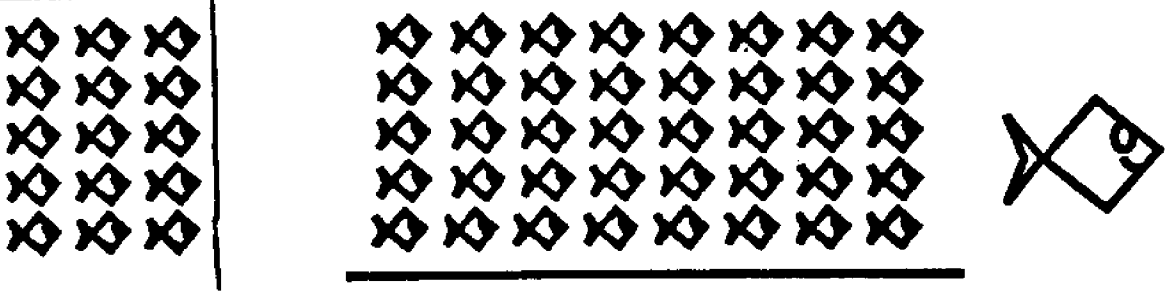
100 AGE 1 FISH



75 AGE 2 FISH



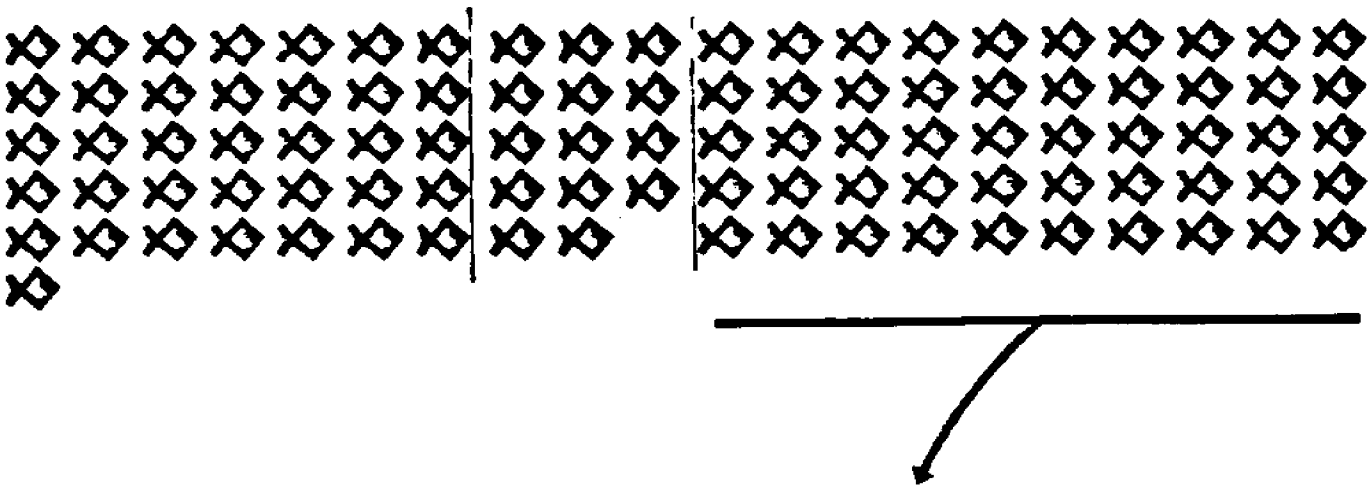
55 AGE 3 FISH

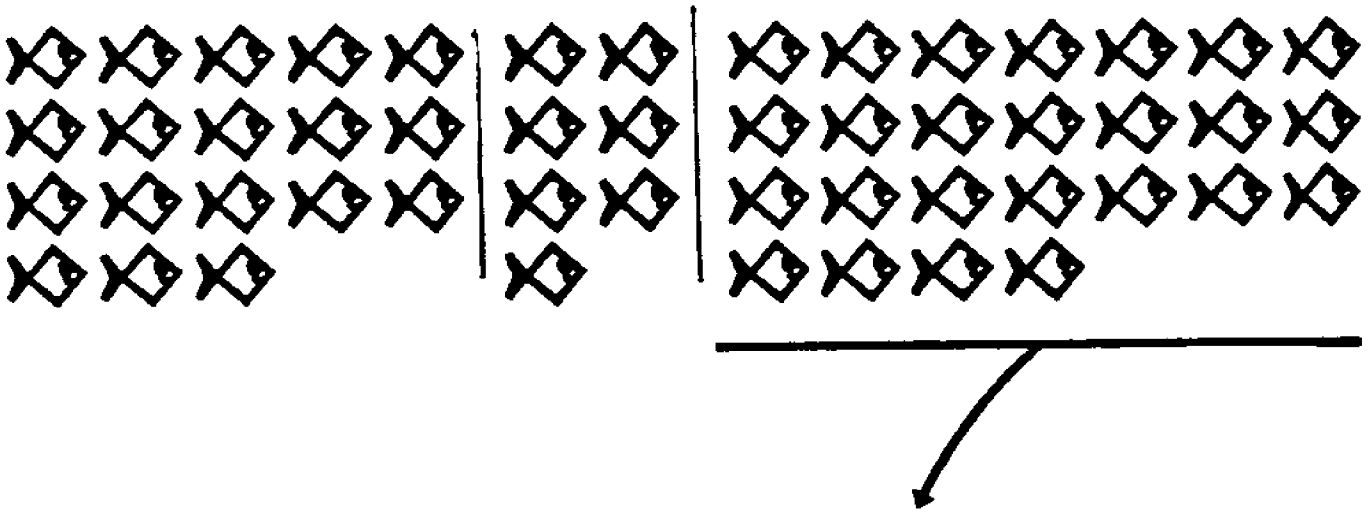


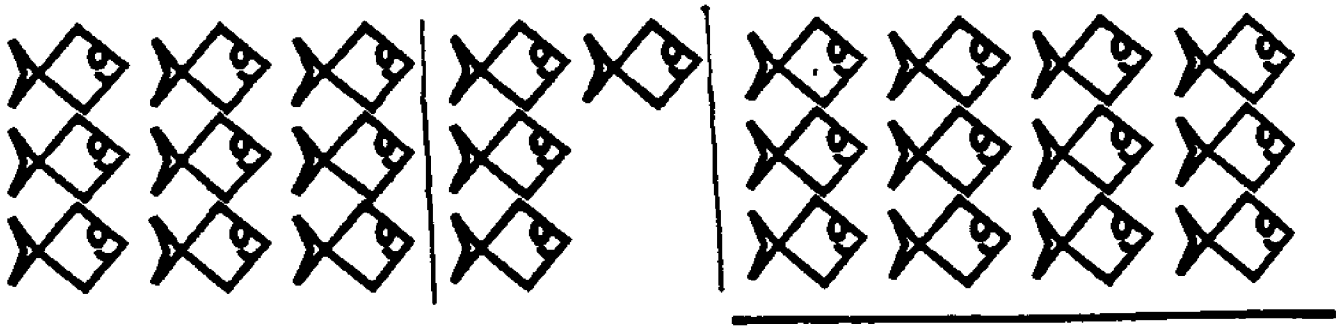
SPAWNING STOCK
80 POUNDS

SURVIVAL

FISHING | NATURAL







CATCH
45 POUNDS

SPAWNING STOCK
24 POUNDS

Too Few Fish or Too Many Fishermen? —Effort Control in the Fisheries

By Dr. Michael Orbach
Marine Laboratory, School of the Environment
Duke University
Beaufort, North Carolina

Physical ecology encompasses the fish habitat, and human ecology involves fisherman, consumers of fish products, legislators, and agency people — all of the people that deal with fisheries. In fact, regulations affect human more than fish behavior. Management has to look at total ecology — both the biological and the human side.

Keep in mind that growth has occurred in the coastal zones in both leisure tourism industries and settlement for retirement and growth purposes. Folks are looking for a place where there is cheap land, nice hunting and fishing, and water access. Movement to the coasts is the single largest demographic trend, and is projected to continue over at least the next couple of generations. Florida and Texas have already experienced this trend, which is beginning to come to Louisiana.

I will focus on a particular set of management tools using this total ecology approach called effort control, also known as limited entry or limited access. It differs from most traditional fisheries management in that these are systems that assign specific fishing rights or privileges to specific fisherman. Unlike a system with a total quota permitting all who desire to fish until the preset quota is reached, effort control limits specific fishermen to specific things or privileges while others are completely excluded from participating in the fishery. The type of limit depends on issues in the fishery.

Why is Effort Control Used in Fisheries Management?

Limited entry, limited access, many types of effort control are used in cases where there are too many or too much of something, too many fishermen, too many vessels, and/or too much gear are demanding more of fishery resource than is available. Effort control is usually used because there are too many fishermen, fishing vessels or too much fishing gear in a given fishery. By "too much" we mean a lot more than is needed to catch the available amount of the fishery resource. As more effort comes into a fishery the "fishery pie" is split into smaller and smaller pieces and thus the fishermen's net income often goes down, the fishery becomes more and more difficult to manage, and the fish stocks or the fish habitat are sometimes harmed by the physical impact of the greater amount of fishing activity.

Where is Effort Control Currently Used?

Some form of effort control is currently used in fisheries on all coasts of the U.S. in fisheries such as salmon, halibut and sablefish on the west coast; surf clams and wreckfish on the east coast; spiny lobster in Florida; groundfish and lobster in Hawaii; and in several fisheries in the Great Lakes and in foreign countries. Limited entry or access systems are also in place for virtually all of our other natural resources — timber, grazing lands, oil and gas, and increasing for resources such as water and air. Competition and density of use has led to implementation of these systems in all of our other natural resource areas so we are not really talking about something new for resource management, we're talking about something new for fisheries.

What are the Major Forms of Effort Control?

The three general forms of effort control are license limitation, Individual Transferable Quotas (ITQs), and gear-based effort control. License limitation is used for salmon in Alaska. In this form of effort control, the total number of fisherman or fishing vessels are controlled in the fishery by limiting the number of licenses in specific categories. In Alaska, they divided the fishery by areas such as Prince William Sound, Southeast Alaska, Bristol Bay, and by gear like power troll, set gillnets, drift gillnets, purse seine and they issued a certain number of permits to fish in each of those fisheries. To avoid a monopoly, they limited the license holder to only one permit in each fishery. They are limiting the number of units that fish in the fishery.

The second form, ITQs, limits the amount of fish which can be taken out of the water each year. Each individual has a specified amount of fish they can take out each year. Like all effort control systems, ITQs identify something specific with each person or with each fishing vessel. For example in the New Zealand groundfish fishery, each fisherman or fishing vessel has a certain amount of fish that they can take each year. An individual can change his personal quota by buying or selling these individual transferable quotas with other fishermen. This type of system controls how much fish comes out of the water as well as who is taking that fish. In theory, ITQs permit fishing anytime a fisherman wants to fish, but he is limited to his own individual quota. He can fish all year round or only when the price is high. It's his choice. ITQs also place a control on "derby" fishery. This is one where the demand placed on the fishery occurs all at once because everybody is trying to out compete each other before the quota closes.

Gear-based limited entry or limited access was set up in Florida a couple of years ago. In this form, the amount of gear is limited. Each fisherman has a certain number of trap certificates — one certificate per trap in the fishery. If you have a thousand certificates you can fish a thousand traps in the fishery. The total number of certificates is not only limited but it is reduced a little bit every year as long as the catch stays constant.

Different problems in the fishery must be addressed with different forms of effort control. No one form of effort control will fit the objectives of industry and management in all fisheries.

Process Toward Effort Control Systems

Effort control systems are somewhat different from other fishery management forms because they largely address social and economic issues in the fishery. Therefore, it is especially important to involve all of the concerned constituencies — commercial and recreational — in the consideration of these systems from the very beginning. It is also particularly important to have a full set of information about the social and economic as well as the biological situation in the fishery when considering effort control systems. The social and economic information helps the managers and the constituents fully evaluate all of the relevant alternatives for effort control. First, this full set of information should be obtained. Second, the concerned constituencies should come together to discuss and evaluate the problems and issues in the fishery. Third, the full range of alternatives for the resolution of those problems should be evaluated, including 'no action' and non-effort control alternatives. Only after the managers and the fishery constituencies are educated in this manner should formal action be proposed.

What Do All Of These Systems Have In Common?

All of the major systems currently in place have begun by distributing an initial set of privileges — whether it be licenses, ITQ or gear-privileges — to the historical participants in the fishery. This distribution has been based on records of licenses, catch or some other document. Basically, everyone with a recorded history of participation in the fishery has received some of these initial privileges.

Although auctions or "first come-first served" systems have been suggested, none have been implemented in any of the major systems for two reasons. First, the Magnuson Fishery Conservation and Management Act does not allow the collection of 'economic rent' from a fishery, and thus auctions or other fees in excess of administrative costs of the license are not allowed. Second, the judgment has been made that distributing the initial privileges to historical participants is a fair way to begin these new systems.

Experience shows that distributing the initial set of privileges to the historical fishery participants puts a cap on the problem. It slows down the escalating pressure being exerted on the fishery but it does not reduce it. As a result, none of the major systems to date have been successful at significantly reducing the amount of effort in the system; that is, the problems have been slowed down, but not often resolved. After issuing the initial privileges, the managers tried buying back licenses to reduce the pressure on the fishery. Buy-backs are difficult because they are expensive and those willing to sell back their privileges are usually the less productive fishermen.

Marketable privileges are used by all of the major systems. That is, you enter and exit from or adjust your level of participation in the fishery through the "market", by buying and selling licenses, ITQ, etc. Marketability introduces flexibility for fishermen, subject, of course, to the cost of the license, etc. The government is put out of the business of controlling the fishery or allocating the fishery's privileges. Instead, the fishermen make those decisions in the marketplace. With this system, fishery managers can focus on biology.

For marine fisheries, all of the current effort control systems address only commercial participation in the fishery. Although the particular problems and issues which effort control is meant to address have occurred principally in commercial fisheries, many of these fisheries have significant recreational participation. A lot of the inland fisheries have a limited entry system for recreational fishing, but most of the marine fisheries areas have confined limited access to commercial fishermen. Increasing attention will have to be given to the relationship between commercial and recreational participation in potential effort control systems.

What are the Major Effects of the Existing Effort Control Systems?

First, the current effort control systems do restrict the number of fishing units, fishermen, or gear in the fishery. The Alaskan salmon fishery is an exception. In that case, decisions have been made to increase the amount of privileges in the fishery. Today more licenses exist that at the beginning of effort control. The cost of entering the fishery is a restrictive or control measure for those who enter after the initial distribution of privileges. However, the cost of licenses, ITQ, etc. generally reflect the profitability in the fishery; that is, licenses are expensive in lucrative fisheries, and less expensive if the fishery is not as lucrative. Generally, these initial costs are amortized along with the other costs of the fishery business.

Second, the current systems appear to lend stability and predictability to their fisheries. Ex-vessel fish prices tend to stabilize and in some cases increase. For instance, in Alaska, salmon fishermen used to be at the mercy of the canneries. By holding control over when and in what quantity the product is brought to the cannery, the fisherman has some control over the price he will receive for his harvest. Banks have responded favorably to the stability, showing some willingness to loan money by accepting a license or ITQ as collateral. Some fishermen then use that loan to buy a boat or other fishing gear.

Stability and predictability show up in a higher degree of compliance to regulations. Although the privilege owners don't own the fish, they do own the right to fish and that is valuable. It's what's call the right of use of property. Although nothing tangible is owned, the right is valuable. Because the privilege owners have this vested interest in the fishery, they will report those who are not fishing by the rules.

Third, some limited entry or access fisheries have resulted in a consolidation of the fishing privileges in the hands of fewer fishermen. Some would call this a loss of freedom to enter or exit various fisheries — especially a problem in multi-species fisheries where people fish different species throughout a year. Most effort control methods are not designed to avoid consolidation. Although some would label this danger of monopoly, the mid-Atlantic surf clam fishery is improved by consolidation. Surf clams are used by large East Coast seafood chains like Howard Johnsons for clam strips. Today the harvesting process is vertically integrated so that the whole industry is controlled by a small number of companies who own lots of big boats, also process the clams, and in some cases, ship them. At one time, some small independent units worked the fishery. In fact, 153 people received the original ITQs. After three or four years, only 40 or 50 ITQ holders and a couple of firms held a very high percentage of those ITQs. In this case, the Mid-Atlantic Fishery Management Council consciously decided to permit this consolidation. They recognized that in this vertically integrated industry, consolidation is the best method of harvest for the fishery. They emphasized, however, that nobody had to sell out. Anyone who objected to consolidation was encouraged to go to court using anti-trust laws.

The Larger Context: When To Use Effort Control

Limited entry or access systems must be viewed against the backdrop of the overall trends in marine fisheries and in coastal communities. Leisure and tourism are the trend in most of these communities, often bringing rapidly increasing land prices and new entrants into the fisheries, often on a part time basis. In addition, most fisheries are coming under increasing regulation in general, and increases in imported fish products add to the pressures on commercial fisheries in the U.S.

In the face of these trends, the question for the U.S. commercial fishing industry is how to adapt. Effort control — limited entry, or access — systems may be one form of adaptation. Each case, however, must be evaluated on its individual merits, with adequate social, economic and biological information. No fishery exists in a vacuum. Neighboring fisheries as well as adjacent industries will be affected by effort control. The full participation of all concerned constituencies is required.

Fisheries Rule Makers: Legislature, Commission, LDWF

By Mike Wascom
Louisiana Sea Grant Legal Department
Louisiana Sea Grant College Program

This brief review of the legislative process in Louisiana with respect to fisheries includes a brief explanation of the relationship between the Department of Wildlife and Fisheries and the Wildlife and Fisheries Commission.

A lot of things that affect the fishing industry occur in the legislature. The legislature passes laws so the dates of it's sessions are important to know. Since the 1974 constitution, the legislature convened every year in April and remained in session until mid July. Anything could be considered during the session and no limit was set on the number of bills submitted for consideration. The House usually had 2,000 pieces of legislation to consider; and the Senate an additional 2,000 pieces.

Last year we the voters passed a constitutional amendment to return to the way it was before 1974 when one year the legislature would meet only to consider fiscal matters (anything connected with the financing of the state, appropriations, taxes, fees) and then the following year they would consider everything else except fiscal matters. And that's where we are today. This year the legislative session that began on April 25 is a "fiscal only" session. The law says it "shall be restricted to consideration to legislation which provides for enactment of appropriations bill, capital outlay bill, levying or authorizing a new tax, increasing an existing tax, legislating with respect to tax exemptions, exclusions, deductions, reductions, repeal or credits, or issuing bonds." So this year during the regular legislative session, unless for some reason you want to lower your fees or raise your fees or dedicate fees that you pay, you will get few benefits from the legislative session.

The Legislature still can authorize some resolutions to study issues however. and it passes resolutions that call for studies of certain issues. This process can be used by fishermen for their own benefit. For example, if there is a conflict between shrimpers and crabbers in some certain area, a legislative resolution would establish a joint House/Senate study committee. These committees usually meet in December, January, February, hold hearings, and discuss the issue. Generally their report contains some draft legislation in it.

Now, any bill-to-be-introduced must be prefiled no later than 5 p.m. of the Friday before the first day of the regular session (which is always a Monday). This helps legislators focus on the type of legislation they are going to deal with and cuts down on the amount of legislation. After that deadline, no member of the legislature can introduce more than five bills, except as provided in the joint rules of the legislature.

If you want to have legislation introduced, you must deal with the House Natural Resources Committee and the Senate Natural Resources Committee. (A list of the committee members follows this text.) If you have a problem in your fishery for which you have an idea for a solution, start working on your own legislator sometimes between the end of last year's session and the beginning of this session. The earlier the better. Discuss you idea with your own individual Representative or Senator and with a member of the House or Senate Natural Resource Committee because they are going to have the most clout. To find the name of your own legislators, get a *Legislative Guide* from the Public Affairs Research Council of Louisiana Inc. (PAR), a non profit good government research organization. This book, issued every four years, describes the legislative process, explains the time limits on bill introduction, contains biographies on every legislator, and provides information on contacting legislators. The cost is $6 for a single copy; $5 for 2-50 copies. It's a good reference. (Send to: P.O. Box 14776, Baton Rouge, LA 70898-4776.)

Have your ideas focused before you visit the lawmaker. Many people are trying to get in to see

him. You should talk to your own legislator about getting the bill introduced, but you should also follow up with a member of the committee because it will be at the committee level where the success or failure of your legislation is determined. These people will even help you draft the legislation. I can also help you draft legislation. All you need to do is describe it on paper in two or three paragraphs. Be simple and direct to make it easy for lawmakers to understand and turn it into a law or regulation. Sea Grant and your Marine Agents keep up with legislation proposals and most of the agents publish it in their newsletters.

If you belong to an organization or if you have allies along other areas of the coast, coordinate your ideas with them. It's important that people in other portions of the state know about your idea and support it. A great idea can fail if all *possible* interested parties are not informed or if broad support has not been generated.

A special session is sort of an exception. The governor issues a call for a special session and lists out whatever topics he wants considered at that special session. If you have a very pressing issue some clout inside the governor's office, you might get your topic included in the call. Otherwise, you have to wait for a regular session.

What is the relationship between the Louisiana Department of Wildlife and Fisheries and the Louisiana Wildlife and Fisheries Commission? (The list of current members of the Louisiana Wildlife and Fisheries Commission also follows this text.) This relationship is a little confusing because of the history of wildlife and fisheries, and conservation efforts in our state. Originally the Louisiana Wildlife and Fisheries Commission was what the department is today. When the 1974 constitution was written, the department was called the Louisiana Wildlife and Fisheries Commission and it had a director. (Article IX, Section VII, of the state constitution) It's a constitutionally created body. A couple of years after the constitution went into effect, the Edwards administration reorganized state government into 20 departments. They could not abolish the Commission because it was a constitutionally structured body, so they created the Department of Wildlife and Fisheries (LDWF) and put the Commission in it. LDWF does research, enforcement, certain functions like seafood marketing, while the Wildlife and Fisheries Commission is the regulatory body with respect to fisheries matters. The Commission is composed of seven members of varying terms as determined by the constitution. Specifically, three members have to be electors of the coastal parishes and representatives of the commercial fishing and fur industries, and four have to be elected at large. More than three can be from coastal parishes, but only three are specifically elected from those areas.

Louisiana's fisheries statutes are organized into a section of Louisiana law called the Revised Statutes in Title 56. It is updated at the end of each session. All of the marine extension agents have a copy of this. In these statutes the Commission is given very broad authority to regulate with respect to fish and shellfish — they can promulgate rules and regulations, set seasons, times, places, size limits, quotas, daily take and possession limits for all wildlife and fish. Fish as defined in our statutes include shellfish. The Commission is now required to look at the overfishing implications, and weigh the social and economic benefits to the state of various fishing measures. This legislation, passed about 4 or 5 years ago, is a substantial change from the way it used to be.

The Commission's power has increased in the past few years. The legislature used to be very jealous of its authority, and wanted specific authority to regulate with respect to each fishery, each shell fishery. The legislature gave some of that authority to the commission because of the volume of details involved in fishery legislation. Today, proposed regulations have to go to a House and Senate oversight committee for approval. The oversight committees for wildlife and fisheries regulations are the House and Senate Natural Resources Committees. Those committees can reject the regulations and send the agency back to the drawing board. The commission meets every other month and newspapers always carry a public notice about the meeting time and location. Many of the meetings are in Baton Rouge.

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Face the Future - Will You Fish?

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In the Gulf of Mexico the red snapper fishery, the primary reef fish in this area, is concentrated in the northern Gulf. Landings at one time in this commercial fishery were as much as 10 million pounds, but reported landings have gone down to 2 million pounds under the quota system. The last unrestricted landings of 3 million pounds were in 1990 or 1989. In recent years, landings have been between 2 and 4 million pounds.

The first officially recorded recreational harvest was 7 million pounds in 1979. It peaked at 10 million in the 1980s and then declined to about 2 million pounds near the end of the period when the regulations took effect.

The fishery management plan for reef fish was not implemented until 1984, eight years after the Magnuson Act was passed. This reef fish plan encompassed over 50 species. In the case of many of these species, little was known biologically or in terms of harvest rates. Keep in mind that the federal government had not collected the data needed for stock assessments until 1984, eight years after passage of the Magnuson Act. And, up to that time and even today, we really aren't sure about the biology of some of the reef fish species, particularly the grouper species. Management action for red snapper consisted primarily of gear restrictions and size limit. That plan primarily put a 13-inch size limit on red snapper and also allowed people to have five fish under the size limit. A single Maximum Sustainable Yield (MSY) value was calculated for all snapper and grouper species combined and it was concluded that the fishery was operating at the MSY level. The major impact was on the commercial fishery. The recreational fishery was not impacted, and the charter boat and head boat industries were exempt until 1987 from this size limit because of a lawsuit they had filed.

In 1989, the Gulf of Mexico Fishery Management Council (GMFMC) changed the basis of stock assessment from a combined MSY to species-specific Spawning Potential Ratios (SPR). This allowed the GMFMC to manage a species on an individual basis rather than managing all reef fish the same way. The individuality of each species life history could be taken into account. The SPR analyses concluded red snapper, red grouper, and greater amberjack were overfished. This management action was based on the first available comprehensive stock assessment provided by the National Marine Fisheries Service (NMFS) in 1988.

The regulations that followed Amendment 1 (1990) expanded management action with more restrictions, size and catch limits, and commercial fishing permit requirements. The amendment also contained a definition of overfishing and established procedures for rebuilding an overfished stock. Overfishing is defined as the point at which the stock goes below the level of 20 percent SPR.

Amendment 1 also defined a commercial fisherman as one who could document more than 50 percent earned income from the fishery. A longline- and vertical buoy gear-prohibited zone inshore of 50 fathoms was established by the amendment; and a seven fish creel limit for recreational anglers and a commercial quota of 3.1 million pounds were set. Shrimp vessels were limited to possession of the recreational red snapper creel limit on board bycatch.

The magnitude of bycatch and its contribution to resource depletion was addressed in Nov. 1990 when the Magnuson Act was re-authorized. A three-year research program to assess the impact was authorized by Congress.

This amendment dramatically increased regulations for recreational and commercial fishermen and, for the first time, included a quantitative evaluation of the impact of juvenile red snapper bycatch in the northern gulf shrimp trawl fishery. The longline restriction, intended to limit longline and vertical

buoy fishing of mature spawning females on the relatively non-structured mud and shell bottoms, virtually eliminated that method of red snapper harvest. But, by restricting the area in which the longline gear could be used, the regulation increased bandit rigs fishing that target smaller fish. This shift in gear use increased the fishing mortality on younger fish and may have decreased the recovery rate of the overfished red snapper stock.

The commercial red snapper fishery was closed Aug. 24, 1991 under the first year of quota management when the 2 million pound quota was filled. The recreational fishery remained open throughout the year. The commercial fishing season reopened in January 1992 but the 2 million pound quota was reached by February 22 — the fishery closed after *only* 53 days of fishing. The commercial fishery was subsequently reopened on an emergency basis with a 1,000 pound trip limit by NMFS to alleviate the economic and social disruption that occurred after the short red snapper season. The fishery then remained closed for the rest of the year.

The last stock assessment for red snapper, completed in 1992, confirmed the earlier findings that red snapper were dramatically overfished and that something drastic had to be done to bring them back. We are due for another stock assessment this year (1994) which, I hope, will show some of the recovery that the fishermen have reported.

Today the GMFMC and commercial fishermen are looking at limited entry with trip limits and ITQs. The plan under consideration would allow recreational fishermen and shrimp trawlers to buy the ITQs and retire them from the fishery. Also NMFS, assisted by Sea Grant and the shrimp industry, is evaluating bycatch reduction devices to minimize juvenile red snapper mortality.

What can we expect in future management action with respect to red snapper? Will red snapper become a game fish? Will it become a bycatch product of the shrimp fishery? Will limited entry in the commercial fishery be effective? And will a similar effort limitation program be needed for the recreational fishery?

The Magnuson Act and the guidelines that NMFS promulgated for the councils stated that in a multi-species you can elect to overfish one species so that you can harvest another. So it is within the council's authority to tell all the directed fishermen, recreational and commercial, that red snapper will be a by product of the shrimp industry. But it's not likely, just as it is not likely that red snapper will become a game fish.

Will limited entry into commercial fishery be effective? We don't know.

What other sorts of things will we see in the recreational fishery? Bag limits will go down and the size limits will go up. Eventually a limited entry program for charter boats, head boats, and maybe even recreational fishermen is a possibility.

The availability of data to support analysis of management alternatives has been, and probably will continue to be, a major weakness of the fishery management process. Basic biological data on major species in the southeastern U.S. has only recently become available. Most questions related to the dynamics of a fishery, fishery impacts on habitat, and socioeconomic impacts of management either go unanswered or are assumed. The lack of adequate assessment data prior to the present has resulted in benign neglect of the resources and also in management over-reaction when overfishing is finally documented.

If any single factor can be identified as the cause of the current state of the Gulf of Mexico fisheries, it is the lack of foresight in securing fishery dependent- and independent data for use in stock assessments. But the power of scientific data lies in it's objectiveness. The best available scientific data is not automatically accurate. Managers bear the burden of interpreting the data with a certain level of skepticism and objectivity. Scientific data is the best foundation for management decision making, but it takes managers to translate it into practical action to benefit both the resource and the fishery.

The regional councils and NMFS need to follow the national standards of the Magnuson Act more closely. These standards represent the intent of Congress to protect and manage our fishery re-

sources with integrity and fairness.

However, I am afraid the future will depend simply on the outcome of the political processes within the fishery management system. The resolution of controversial fishery issues probably will not be resolved through a logical science (data)-based process but rather on the basis of which user group can exert the most effective political pressure on the executive and legislative branches of government. The National Standards, which some fishermen consider the fishery bill of rights, are now regarded by most fishery managers as nothing more than general guidelines. NOAA General Counsel has even stated this. This means that management decisions no longer are held up to an objective set of criteria, but are judged solely on their short-term political merits.

In this environment, as long as different groups (set apart by type of fishing or type of gear) are fighting each other for the winner to take all, nobody is going to win. Only if everyone works together to make fair and balanced decisions within the management process will it be possible for fisheries to be successfully managed on an ethical basis that truly represents the intent of Congress.

Future Use and Management of Shrimp in the Gulf of Mexico

by Thomas J. Murray
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Let us briefly examine the relative growth and input trends in the Gulf and South Atlantic shrimp harvesting sector over the past 20 years, separating the real from the "illusory." Growth can be attributed to capital expansion, which simply means more vessels and more human capital in the shrimp fishery over the years. The expansion began with passage of the 1976 Fishery Conservation and Management Act (FCMA), designed primarily to remove foreign fleets from the new U.S. Exclusive Economic Zone (EEZ). It was oriented initially to removing Russian, Polish, and Japanese trawlers from the U.S. coast. The result was that hundreds of U.S. shrimp vessels were in turn forced to return from foreign waters like Mexico and Brazil to the Gulf of Mexico following 1976 implementation of the Fisheries Conservation and Management Act. Some of the Texas and Louisiana vessels that had been fishing three or four months of the year off the Yucatan or off Tampico were forced to find a way to harvest exclusively in U.S. waters. These vessels were of larger size classes than some of the vessels in U.S. waters. At the same time, the existing number of fishermen in U.S. waters increased. This was fishery management-related capital expansion.

An example of this exists today in New England. In the area of Georges Bank, the North Atlantic Fishery Management Council recently (1994) reduced the quota on yellowtail flounder, cod, and haddock by 50% because of fishery overcapitalization — the demand on the resource is too high. (In this most recent case, the federal government has proposed $30 million in support funds to soften the blow to the local economies. This is the first instance where the federal government appropriated money for the U.S. Department of Commerce to compensate for a fishery collapse either from environmental or overfishing causes.)

At about the same time, government-induced capital expansion occurred. These outside the fishery factors reinforced the growth in U.S. harvesting capital from the fishery-related expansion. The government encouraged fishery development. The U.S. Department of Commerce through the National Marine Fisheries Service (NMFS) increased financial assistance activity under the Title XI Loan Program. By 1988, this program funded in excess of a $100 million in new and reconstructed capital in the southeast region (North Carolina to Texas) shrimp industry. Ninety percent of the activity was in shrimp trawlers in the Southeast region. By 1988, it funded 110 such operations valued together at $32 million in Louisiana alone. The Title XI Loan Program guaranteed loans. People in the shrimp business who qualified under the program could have a loan guaranteed at a local bank. Another federal program, the Farm Credit System via the Production Credit Association (PCA) financed fishing vessels over a 15-year period, longer than the norm.

These two sources of government -authorized funding joined by commercial lending institutions served as conduits of expansion during the late 1970s and early '80s. This was an inflationary time in the U.S. For example, fishing vessels often attracted attention by nonfishing investors because of the healthy investment tax credit — at that time 10%. You could by a $200,000 boat and get a $20,000 investment tax credit at the same time. Rapid capital depreciation rules prevailed in the late 1970s too. The net result: somebody who wasn't really committed to the shrimp industry could get in for about a 12.5% investment (2.5% cash investment plus a 10% investment cash credit) with an 87.5% government-guaranteed loan.

While all this capital was coming in, increasing shrimp prices further fueled expansion. The average weighted price of 31/35 count raw shrimp tails throughout the Gulf increased from $2.83/pound to $4.26/pound from 1978 to 1979 — almost doubled in only a two year period. Unfortunately over that

same brief period, the high prices masked a rise in Gulf of Mexico diesel fuel prices from around $0.39/ gallon to $0.85/gallon. And as we know, shrimping is a very fuel intensive business. By 1981, fuel averaged $1.11/gallon and the average Gulf price of 31/35 count raw shrimp tails had gone from $4.26/ pound three years earlier, to $2.51. This was a real cost/price squeeze.

The sale price of vessels increased as well, in part due to inflation, and in part due to demand. A significant inflation in vessel construction prices occurred over the 1976-80 period. The price for a typical 75-foot vessel increased from $142,000 in 1976 to $386,000 in 1980. Used vessels' values actually increased over the same brief period. In other words, the surge in demand from capitalization created a shortage in vessels. Many fishermen saw that a vessel could be sold for more in 1978 than it's original purchase price in 1974. They sold, and reinvested in bigger, more expensive vessels — with loans guaranteed by the federal government. Investment tax credits provided more capital with which to make these purchases. Few realized that this was a short term phenomenon. Many concluded, incorrectly that the increased success of shrimping was really that extraordinarily profitable.

In other words, tax policy and government policy having to do with financing instead of fishery policy caused the value of fishing vessels to increase during this period. A lot of the sales cost increase wasn't related to the earning capacity of the fleet but to a kind of a gold rush atmosphere.

By the time the truth started to be known, it was too late. Analysis of sales of one-year-old trawlers built in 1979 and sold in 1980 showed an average 25% appreciation in one year. These kind of signals should have told us what the future was going to be. It couldn't last. It wasn't driven by the asset value of the earning potential of that boat. We are finding out now what the asset earning potentials of those vessels are and it isn't very good.

A long-term decision was made on short-term phenomena. The federal government contributed to the latter because they legislate short-term programs like Title XI while they also have long term influence on the fisheries through management. This can happen again.

Some circumstances look similar: The price of 31/35 product averaged about $3.35/pound at the end of August 1993, and diesel fuel prices hovered around the $.75/gallon range. Others look different: Continued difficulty in obtaining affordable vessel insurance limits the credit worthiness of today's shrimp vessel borrower. With the Tax Reform Act of 1986, vessels are worth what they can produce. Little new capital is going into today's fishery. A lot of people appear to be leaving the Gulf shrimp fishery.

Declining effort appears to be occurring, and there are indications that catch per unit of effort may in fact be increasing. We've had such a contraction of effort either from boats leaving, making fewer trips, or from fishermen reacting to the negative things that are happening offshore, that the catch per unit of effort now may be actually *increasing* a little bit Gulf-wide. For once, the federal government and the shrimp industry people who fish offshore conform to each other's opinions.

This all has the implication for production issues of current interest in bycatch, endangered species, limited access, and management. We're right at the point now where the shrimp industry has reached a peak and is going down. The issues now facing the shrimp industry are:

•Will the offshore shrimp resource support the fishermen now that there are fewer fishermen and less government incentive to get in? In other words, will people shrimp because their boats have earning power to support the fishermen's life styles?. Will the size of the offshore shrimp resource support those vessels still trawling?

The product itself has stiff outside competition. The growth in shrimp supplies since the late 1970s has been widely heralded. In 1976, U.S. landings of shrimp were 245 million pounds and 270 million pounds were imported. Fifteen years later, 1981, U.S. shrimp landings measured 198 million pounds and imports accounted for 632 million pounds. World shrimp production is riding a crest of a rapidly evolving world wide mariculture industry. By the conclusion of 1993, shrimp imports into the

U.S. have grown steadily for four years to a level of just over 600 million pounds but the consumption of shrimp has jumped 43%. Of those imports, 42 of every 100 pounds arrives already peeled, compared to 24 of every 100 pounds in 1989. It looks like the market can absorb domestic landings comfortably.

What problems will the bycatch dilemma contribute to the success of the fishery?

Most of shrimpers efforts in this area have been directed toward trying to prove that the bycatch species is caught only in very small numbers in the trawl. These efforts are not enough because an idea is gaining strength among the general public that bycatch is wasteful — that is killing "X" pounds of a species in order to catch one pound of shrimp is a physical and biological waste. Social pressure is going to make the federal government or the council take action on shrimp bycatch simply because of this perception.

This pressure will affect both the commercial and recreational fisheries. Fishermen must pay attention to this social pressure and be prepared to become adept at analyzing data and models used to develop regulations. Fishermen must be prepared to view bycatch in a broader than species-specific manner. For example, limited entry and individual transferable quota (ITQ) program could be viewed as a means of reducing bycatch and enhancing conservation.

The shrimp fishery isn't characterized to participate effectively in the limited entry program using ITQs. Shrimp fisheries are complex multi-species fisheries with wide-ranging sizes of shrimp available for harvest in both federal and state waters. However, it seems to be politically incorrect today to say that ITQs won't solve problems. There is some interest in Washington D.C. for people to verify the potential for this concept (ITQs) with facts and figures.

Instead, we (the fishermen) have to decide our own allocations — how many shrimp of a certain size we can take and still preserve our fishery either through sanctuary, season, or closings, or some similar method. We have got to take a look at that explicitly, to confront it. If we don't confront it, we will be shortchanging ourselves.

For instance, inshore, about 940 fishermen attended and filled out questionnaires at one of 8 meetings held around the state recently on white shrimp sanctuaries. About one third of the meeting participants said they were in favor of white shrimp sanctuaries in some location, not necessarily all locations. Two thirds of the participants didn't want anything to do with white shrimp sanctuaries. How do you define a sanctuary? If we just say that white shrimp sanctuaries are places where catching white shrimp is forbidden, we have one definition. But if it is a sanctuary where you can't even hook a fish and release it, you have a more comprehensive definition that implies limits on recreational and commercial fishermen. This second definition may be applied to federal refuges — many in Louisiana. Fishermen have to take the lead or pay consequences later.

Perhaps we can protect the resource through the commercial shrimping license. At present, the State of Louisiana treats its licensees in a conflicting manner. In order for commercial fishermen to secure a fuel tax exemption or a sales tax exemption, each has to provide a notarized certificate when applying for those programs that 50% of his income is generated by commercial fishing. If in fact we may have too many people inshore perhaps putting undue pressure on the resource, why not be consistent? Why not make the application for a commercial fishing license include notarized certification that 50% of the applicant's income is generated by commercial fishing? It is just a small step. We recognize it to get the tax incentives and the benefits the state gives you. These are state resources. Since the shrimp are the biggest of the benefits the state has, those benefiting from it should also depend on commercial fishing for some of their income.

Overall, these comments point to two important needs. First, shrimpers need to develop stronger leadership to effectively participate in policy development. Second, governments at all levels need to develop consistent policies. Consistent policies send clear messages to those using public fishery resources — messages that resource rusers can incorporate into their planning and conservation efforts.

Face the Future: Will You Fish Blue Crab?

By Alan Matherne
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Blue crabs are a crucial component in estuarine food webs. The blue crab fishery is one of the largest commercial and recreational fisheries in both Louisiana and the Gulf of Mexico. Crabs rank third in value in the Gulf of Mexico behind shrimp and oysters. The blue crab fishery is the largest crab fishery in the U.S. compared to fisheries such as the king crab, the snow crab, and the golden crab fisheries. Prior to World War II, the Louisiana blue crab fishery accounted for about 91% of the Gulf total crab harvest. Since 1968, it has made up a third of this total and since 1983, the Louisiana harvest of blue crabs has made up more than half of the total Gulf production. The fishery, unlike many of our other fisheries, occurs almost *exclusively* in state waters.

The biology of the blue crab relates to the fishery. Blue crabs reach reproductive maturity in about 10 to 12 months — they are an annual crop just like shrimp. Blue crabs utilize the entire range of the estuary, from the fresh waters of the inland bays and bayous to the saline waters of the Gulf of Mexico. Because of that range, coastal land loss and coastal degradation could have a major impact on the future of the crab fishery. Blue crabs are taken year around in coastal Louisiana in fresh, brackish, and shallow Gulf habitat.

Growth and maturation occurs through a series of molts. When a crab's hard shell is shed, a more valuable product called the soft crab is produced.

The blue crab fishery provides a very important source of employment for many of the economically depressed areas in the coastal zone. Employment in the harvesting sector creates additional employment in the wholesaling processing areas. Commercial harvests are believed to have occurred since at least the early 1800s. Landings are documented since at least 1880, and continuous data upon which to make crab fishery management decisions has been documented since 1948. This fishery initially developed in the New Orleans area, probably because of the marketing potential for fresh product. Processed product came later.

Prior to 1969, Louisiana averaged about 8 million pounds of commercial hard crab landings per year, in the range of about 0.25 to 31 million pounds. Although baited trotlines were the primary harvest method, some crabs were harvested, particularly in the Lake Pontchartrain area, using drop nets, and some incidental catch resulted from trawls, handlines, and hoopnets. From 1967 into the 1980s, landings increased steadily, mainly the result of the increased use of wire crab traps. These became predominant in Louisiana in about 1967. Since that time, harvests in the blue crab fishery have increased dramatically, with several record harvests. Blue crab harvests peaked in 1988 with the highest recorded harvest ever in Louisiana of 53.5 million pounds.

Most of the increase in this fishery occurred for a number of reasons:

- Recognition of the apparent underutilized abundance of the blue crab resource.
- A low fixed investment requirement. Just about anyone with a small boat, an outboard motor, and a couple of hundred dollars can buy a few crab traps, some bait, licenses, and become a commercial crab fisherman.
- An oil and gas depression at the time of peak abundance. High unemployment led many non-fishing people to enter the fishery to secure income for their families.
- Overfishing in other fisheries. Many of these commercial fishermen turned to blue crabs to maintain income.
- Vietnamese immigrants. The crab fishery was one of the easiest for the Vietnamese to enter.

In the late 1980s and early '90s, the number of fishermen entering this industry stabilized. Rapid growth in the fishery during previous years resulted in declining catch rates. Although the number of fishermen entering the industry stabilized, the number of traps per fisherman and inflation increased. Fluctuation in yearly stocks began to be common, not only because of the increased harvest effort in the fishery, but also because the estuarine environment upon which the crabs depend was changing.

Last year, 1993, production was down about 13% from 1992 (51.7 million pounds in '92 decreased to 45.3 million pounds in '93). The number of crabbers peaked in 1989 at 3019 according to the number of crab fishing licenses issued. The total has varied from the early 80s to present between 2500-3000 licenses issued.

Landings in the soft crab industry prior to 1940 were actually pretty high — almost 200,000 pounds per year on average taken mostly with bushlines, haul seines, trotlines, dipnets and dropnets. During the 1940s and '50s, production varied between 350,000-881,000 pounds. During the 1960s, '70s, and '80s, the soft crab industry in Louisiana declined to 75,000 pounds in 1984.

Decreased water quality in some of the production areas reduced the quality of the habitat. When silted or otherwise polluted water was either pumped through flow through systems or naturally flowed through large cypress boxes called floatcars or vivias (used to hold soft crabs during molting), production was negatively affected. Soft crab production was also affected because of the lack of a reliable source of buster crabs. Hard crab fishermen didn't recognize the value of buster crabs as an important source of extra income.

After 1984, soft crab production increased to nearly a quarter million pounds in 1990, partly due to new technology for soft crab production and partly because those in the hard crab fishery realized that they could sort out the busters and sell them to soft crab producers. The technology of recirculating filter systems, developed in the late 1980s and early '90s, eliminated dependence on natural water and the accompanying pollution problems. Through Extension Service/Sea Grant workshops, a lot of people replaced their float cars with these systems. Jimmy pots were also developed. In these crab traps, the male is a decoy. Since females are ready to mate when they molt, they are enticed into the trap and then harvested.

Crabbers realized that they could increase fourfold the value of some of their crabs if they simply culled and sold the busters. Crabs prices may range from $0.20 to $0.50 a pound, but buster crabs can range anywhere from $0.30 to $0.80 or more each.

The recreational crab fishery is important to Louisiana's recreational fishing although it yields only a small percentage of the commercial harvest. Vince Guillory's study in Terrebonne Parish showed that about 4% of the total commercial harvest came from recreational fishermen. Recreational fishing effort and harvest has increased in the past 25 years for a couple of reasons:

•The increased mobility of residents. Two-thirds of Louisiana's residents are within a two-hour drive of our coastal zone making access to the fishery easy.

•A new family activity. With a bucket of chicken necks, the whole family can catch crabs and, at the end of the day, have good food to take home and boil.

The Blue Crab Fishery Today

The Louisiana Crab Task Force, for which I have served as a facilitator since its inception in the late 1980s, has observed and been part of many changes or trends.

•Gear has stabilized. The plastic-covered wire crab traps are now primary gear although some incidental and directed catch still occurs by shrimp trawls. Trotline crabbing is just about extinct.

•Landings and harvest have stabilized. Since 1987, Louisiana has averaged about 47 million pounds of blue crabs per year with only two low years in that period — 1989 and '90 with only 33 and 39 million pounds respectively. Crab production appears to be cyclical.

•The average size of crabs has decreased (according to anecdotal data, primarily from enforcement

officers).

•The value of the fishery is increasing. Last year some crab fishermen received record high prices at dockside — as much as $1 per pound for top grade. On average over the 1987 to '92 period, dockside prices ranged from $0.35 to $0.52 per pound, and the dockside prices for blue crab in Louisiana are slightly higher than the national average. The blue crab fishery in Louisiana is worth about $55 million annually — ranging between $44 and $64 million.

•The processing industry upon which the blue crab industry depends is volatile. The picked product is the most profitable. Crab processing will most likely be significantly affected by new safety and health regulations, particularly the HACCP (hazardous analysis critical control point) program.

•The crab industry has come a long way in leadership and organization. Small local organizations (Concerned Crabbers of Louisiana) eventually evolved into the Louisiana Crab Task Force in the late 1980s. It is heavily involved in management.

Problems To Be Faced

This fishery is faced with many problems. Habitat degradation can result in reduced production. Over capitalization has occurred in the crab industry and may be continually occurring. User group conflicts, particularly between crabbers and shrimpers or amongst crabbers is ongoing. Crab and crab trap theft escalated when the value of the fishery increased in the 1980s and will probably continue to increase. Harvest and possession of undersized crabs is the most common enforcement problem in the crab industry. Water quality and the availability of busters continues to affect soft-shelled crab shedding. Bait, accounting for about 34% of crabbing expenses, is complicated by occasional shortages. Imports and the production of surimi or artificial crab products may create market problems as they attempt to replace natural crab meat in some markets. Expenses related to new health regulations could drive some of the small crab processors out of business. Establishment of time and area restrictions as recently instituted in the Sabine Lake area, could set a precedent for other areas.

The lack of good consistent data complicates blue crab management. Little soft-shelled crab production data exists and without shedders' licenses, no easy way exists to obtain it. Gaps exist in the blue crab fishery data as well. Some of the recorded harvest fluctuations may be due to the variety of methods used to estimate landings.

The Future

In the short term, enforcement is going to increase — on the water, in the bayous, and in the marshes. Crabbers are trying to regulate themselves. Through the Louisiana Crab Task Force, they're sponsoring legislation this session to increase the crab trap license fee to $100. The revenues generated by this increase would be used by a crab enforcement strike force similar to the oyster industry's. The task force is also proposing a $25 crab shedders license.

On the long term, this fishery may have to work within seasons, and restricted areas. Increased management and more regulations are certainties but, but with good leaders, strong organization, and the task force, the industry should be able to guide and influence the development of those regulations.

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Face the Future: Oyster Marketing

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Louisiana has historically led the nation in the production of oysters with annual harvests generally ranging from about 8 to 13 million pounds (meats). The dockside value of the annual harvests has ranged from about $15 million to more than $25 million.

As aptly described in the November/December 1990 issue of the trade journal *Seafood Business*, the southeast oyster fishery, including Louisiana's, can best be described as a "beleaguered industry." Concern has traditionally focused on those environmental parameters detrimental to long term production sustainability. In more recent years, however, concern over low prices has also been expressed within the industry.

Evaluated on a quarterly basis, Louisiana's oyster production ranged from about 2 million pounds to almost 5 million pounds during the 1980s and was highly cyclical in nature (Figure 1). Reported production for the first three years of the 1990s was substantially below the long-run average quarterly production of the 1980s and never exceeded the three million pound mark in any one quarter. Despite the sharp decline in poundage produced, the corresponding dockside price also fell substantially with the downward trend becoming particularly apparent in the first quarter of 1991 (Figure 2). In the last quarter of 1990, for example, the Louisiana dockside price averaged $3.59 per pound (meat). It fell by 25% to $2.70 per pound in the first quarter of 1991 and by the last quarter of 1992 it averaged just $2.04 (or more than a 40% decline from the price reported in the last quarter of 1990). The concurrent decline in products harvested and price has resulted in a dockside value lower than observed since the early to mid 1980s.

The decline in Louisiana's dockside oyster price can be attributed to two primary factors. First, away-from-home consumption, which constitutes a large proportion of oyster usage, tends to be very responsive to conditions in the general economy. When the U.S. economy was in a recessionary period during the early 1990s, the demand for oysters declined.

The second factor which attributed to the decline in the price of Louisiana produced oysters was the increased awareness by health officials and the general public concerning the consumption of raw oysters infected with the naturally occurring bacteria, *Vibrio vulnificus*, found in an extremely small proportion of harvested oysters. While the occurrence of the bacteria is small, the implications of consuming raw oysters containing this bacteria are large among the small segment of the population whose immune system is susceptible to *vulnificus*. While little or no threat to healthy people, *vulnificus* from warm-water oysters has been linked to at least 50 deaths in California, Louisiana and Florida since 1977 (*Restaurant News*, 2/4/91), according to Health Services statistics.

California, in response to the health threat, initiated a program on March 1, 1991 which required anyone selling Gulf Region-produced oysters to notify potential consumers that the "consumption of raw oysters can cause illness and death among people with liver disease, chronic illnesses, of weakened immune systems." (*Restaurant News*, 2/4/91)

The mandatory California warning labels, the first time a state agency has ruled that a warning label must be placed on a food item, has reduced the demand for Louisiana's oyster harvest. Sales of shell stock in California by Louisiana and Alabama oyster growers and dealers reportedly fell by as much as 60% after the mandatory warning labels in that state (*Restaurant News*, 3/91). Furthermore, California's mandatory warning received extensive press in the local papers, including front page headline in the *Times Picayune*. This negative publicity likely resulted in a reduction in local demand for the product. Finally, at the time that California began requiring warning labels, many of the Louisiana dealers began to voluntarily place warning labels on their products in the local markets (the warning label has since be-

come mandatory in Louisiana). The impacts of all these factors on price are clearly evident (see Figure 2).

Since early 1992, this downward price trend has leveled off. There are some longer run issues that could further impact oyster prices, however, that the industry must also consider. First, awareness concerning estuarine pollution and its potential impact on the quality of seafood we consume has been heightened in recent years through extensive publicity. The U.S. annual per capita consumption of commercial seafood peaked at 16.2 pounds in 1987 and by 1992 had fallen almost 10% to 14.8 pounds. At least a portion of this decline can be attributed to the negative publicity. Oysters, being estuarine-dependent and filter feeders, are particularly susceptible to pollution. Specifically, they are known to harbor many of the pollutants.

A second, long run issue confronting the viability of the oyster industry is the increased competition among food products and other seafood products. The beef industry for example, makes significant expenditures annually to promote its product. Some seafood products, such as salmon and catfish, are also promoted widely on a generic basis. Given limited household food budgets, increased competition from other seafood and non-seafood products is likely to negatively impact the demand for oysters.

Finally, it is important to recognize that the existing labeling laws are likely to continue and, in the longer run, more restrictive labels may become mandatory. The current label is very detailed but is targeted toward only the small portion of the population with immune-compromised systems. The labeling may become more broad in the future.

These short- and long-term issues all present a challenge to the oyster industry. The quality control afforded by HACCP - hazardous analysis critical control process - during processing may make consumers feel better about the food they are buying, but those warning labels still stimulate apprehension. Income growth in the 1990s could lead to an improvement in oyster prices. Prices tend to increase with income. Income growth is dependent upon domestic politics.

Improved prices require counteracting these long and short term phenomena in some way. Perhaps, generic oyster promotion would help. Certain characteristics of a product are conducive to advertising or successful promotion.

1. The product must be relatively homogeneous - a single type of product. From that standpoint, oysters may be successfully promoted.
2. A product must not totally lose its identity in the marketing channels. People can recognize an oyster in many forms - fried, baked, or canned.
3. Substitutes should not be available - at least not an excessive number of them. Two types of oysters are available: the Pacific and the Gulf oyster. The Chesapeake is hardly marketed anymore. Imports are limited. The major substitute would be other types of seafood.
4. The producers must have common objectives. Most of the producers in Louisiana have one objective - to improve the price of oysters.
5. The industry must not be monopolized by a few firms. Although Louisiana has some large producers, the absolute number of producers and dealers is relatively large.
6. The existing supply response to rising prices is important. The goal of the promotion is to increase demand, and increase price. But a large increase in supply responding to increased price can actually bring the price back down. In Louisiana, the production of oysters is fairly limited. Louisiana averages 10 to 12 million pounds per year independent of price movements. Imports are almost an exclusively canned product, providing little competition and having little effect on the fresh supply.
7. Funds for promotion must be adequate and exist to ensure continuity from season to season. The Louisiana Seafood Promotion & Marketing Board, which promotes all seafood in Louisiana including oysters, has a relatively limited budget of about $300,000 to $400,000 a year. the oyster industry has taxed itself through the Oyster Task Force, recommending the sale of the tags and use of resulting rev-

enues to promote oysters.

Therefore successful promotion in the oyster industry is possible. An example was conducted just before Lent and Valentines Day at Schwegmann's. It started a month before Valentine's Day. A pearl necklace was a prize on a drawing among all of the customers who purchased oysters during the month-long promotion. The promotion board spent about $1600 on this promotion campaign. The seafood manager at Schwegmann's said that oyster purchases increased by 40% during the campaign. In other words, a relatively small promotion campaign can be successful in improving the oyster market and increasing the price of the product.

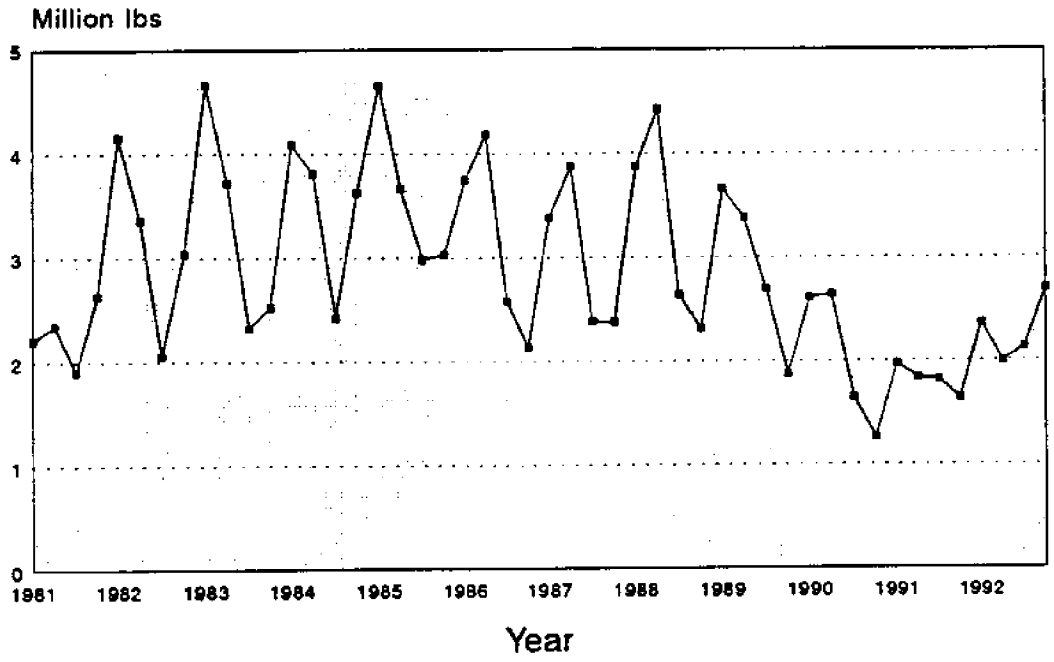

Figure 1. Louisiana Oyster Landings
(Quarterly Data)
1981-1992

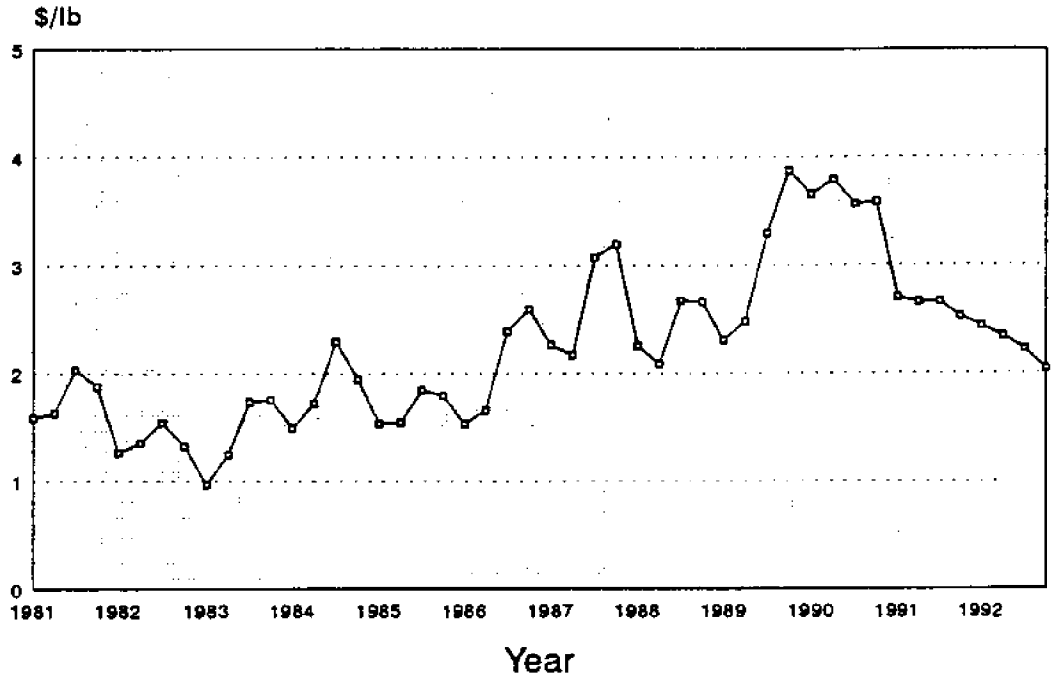

Figure 2. Current Price of Louisiana Oyster Landings
(Quarterly Data)
1981-1992

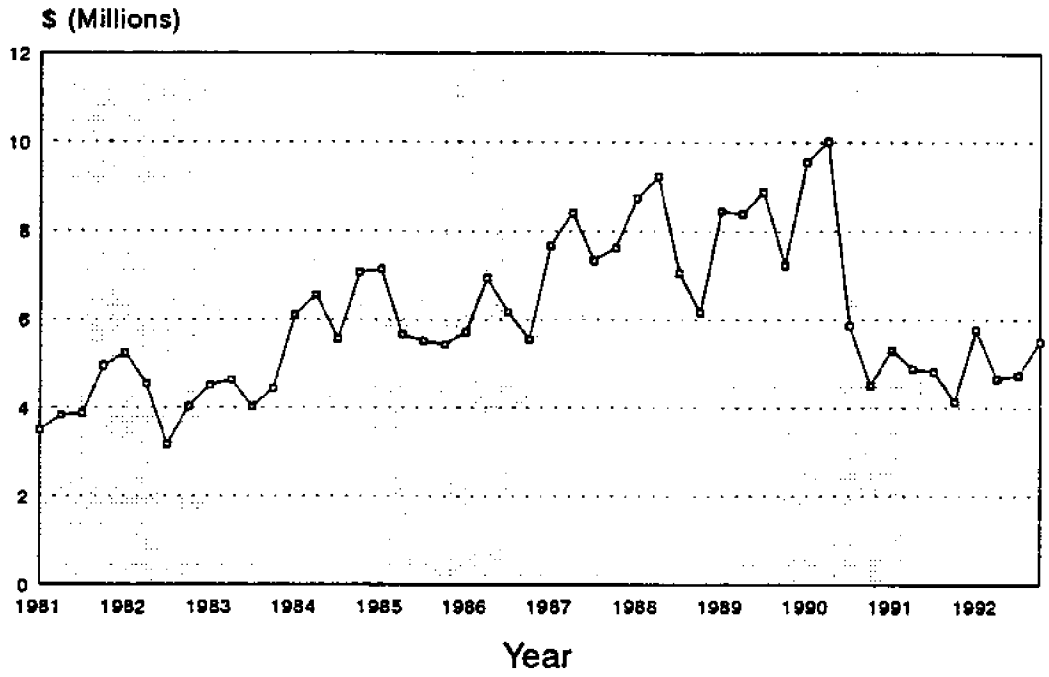

Figure 3. Value of Louisiana Oyster Landings
(Quarterly Data)
1981-1992

Face the Future: Will You Fish Spotted Seatrout?

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The objectives of scientific fisheries management are preventing overfishing, preventing under utilization, equitably allocating the resource, and sometimes increasing production in a species-specific manner. In many cases, fisheries management actually is trying to maintain what we have. The speckled trout or spotted seatrout is probably the fish that is targeted most by sport fisherman throughout the Gulf of Mexico region. Will it be in the future? Let's look at management and this species in its habitat.

What data is required for fisheries management? We need to know the total number of fish available, the number added each year by spawning, rates of growth and death, the environmental factors that give life support to the species, and the kind of effort it takes to catch the fish.

Speckled trout generally spawn between March and October. Their feeding habits change as they mature. Early in life, spotted seatrout feed on crustaceans, and then feed more on fishes like mullet as they mature. Generally, the bigger the fish the bigger the fish food item is. They feed on what is available within the food chain.

The estuarine habitat supports the speckled trout. Marshes feed the estuary, which in turn feeds the food organism, which feeds the trout. This chain begins in fresh water and continues to the estuary, the beach ridge, eventually to the Gulf. Vegetation is broken down by bacteria back in the marsh, forming detritus. The detritus is consumed by the juvenile organism and some crustaceans — crabs and shrimp — which are then eaten by the fish population. The young trout consumes shrimp, the older trout, mullet, both available only because of the presence in the chain of detritus. It's the base of the swamp and estuary food chain. Algae is the base of the inland lakes and marine food chains.

In some data we collected in a Sea Grant project in Mississippi several years ago, the spotted seatrout or speckled trout accounted for 12 percent by weight of the catch and had an average weight of 1.43 pounds. These data were gathered by a roving creel sampling at Horn Island, Ship Island, and Cat Island off the coast of Mississippi. Based on our knowledge of the habitat, these seatrout undoubtedly were supported by coastal wetlands. What would happen to these figures under conditions of Louisiana's coastal wetland loss?

From 1978 to 1990, about 34.9 square miles of marsh land were lost from our coastline. According to Dr. Eugene Odom at the University of Georgia, one acre of marsh supports about 600 pounds of harvestable fish. By taking 10% of that figure to get the amount of harvestable speckled trout, (rounding off from the roving creel sample) we could assume 60 pounds per acre of the harvest is speckled trout. Converting that figure to a per-square-mile basis, we can assume 38,000 pounds of speckled trout per square mile. Therefore, if we lose 34.9 square miles per year, we can estimate an annual loss of production of a little over 1.3 million pounds of speckled trout. In fact, the production potential of everything dependent on the detritus base of the food chain would be reduced by wetland loss because fewer crustaceans will survive because less food is available for them, providing food for fewer larger fish like the speckled trout.

Fresh water diversion projects like the Davis Pond project in the Bonne Carre Spillway have the potential for building or rebuilding marshlands. As Jerald Horst indicated, these projects might lead to some species displacement because of changed marsh location or loss of a species before rebuilding occurs.

Habitat may also be reduced because of the relationship of nursery area to stream flow. Low stream flow or stream discharge leaves quite a bit of brackish area — nursery — for the production and survival of juvenile speckled trout. But moderate discharge reduces the nursery area for spotted seatrout

and for any other organisms associated with the nursery area food chain. In flood conditions the fishery is displaced a little further offshore. In the Biloxi marsh when the Pearl River was in flood stage, I have observed many freshwater fishes — catfish, bass, etc. — that came across Lake Borgne into the Biloxi marsh area.

Data shows correlation between the production of the year-class trends of speckled trout and the stream discharge. For example, in some data by Dr. Fred Bryan, U.S. Fish and Wildlife Service, LSU School of Forest Resources, taken at a high discharge show high crawfish production. The 1973 and '74 year-class strength for speckled trout was very low due to loss of nursery areas from these floods.

It takes about 3-4 years for peak production to recover. By looking at the peak in the data and a drop in "77 in stream discharge, you can predict that the landings of speckled trout or estimate that the population will increase in about 1980 — and both did.

Seasons or time of stream discharge are important with species like this one. When speckled trout are spawning between March and April, a high discharge will negatively affect year-class trends.

People impact the fishery resource by allocating the resource among groups. An abundant fishery resource impacts people by motivating them to catch fish. People also impact other people in the fishery — such as the gillnetting-sportfishing controversy because each takes some of the resource from the other. Speckled trout can survive and do well without our management. In fishery management, we are really managing people — how a resource can be allocated equitably between the user groups. Some give and take is required; every user group must sacrifice something. People management is the same in all fisheries, but the biology of each species differs and, as a result, allocation portions may differ.

In a graph of total averages of spotted seatrout by age groups from data gathered by Corky Perret, Dave Arnoldi and me, one-year-old speckled trout are about 6-6.5 inches. They reach 12 inches at ages 2 and 3. At that time, they leave the nursery and enter the fishery. In the second or third year, they produce an average of about 15,000 eggs each; at age 7-8, a spotted seatrout can produce over a million eggs. This means 50-100 of the younger, small fish are needed to have the spawning potential of one larger fish.

This biology leads me to conclude that the 12-inch minimum now used for allocating spotted seatrout may not be in the Louisiana spotted seatrout fishery's best interest. Elimination of the 12-inch limit may be the best way to manage the spotted seatrout in the Louisiana waters.

Louisiana has a large expansion of marsh to support a large young population. Natural mortality of the largest population segment, 2-3 year olds, is higher than that of older fish. By permitting fishermen to catch some of these smaller fish, the population of the smaller fish would be reduced by catch and natural mortality, making more room in the habitat for the older fish to spawn. Allocation would be simply by number of fish. Enforcement would be easier— an enforcement agent would not have to measure recreational catch, only count the number of fish. Sportfishermen and gillnetters could be similarly managed because both could be restricted by size and numbers. Some data show that the size of fish harvested can be controlled by gillnet mesh size. The smaller mesh size snags more of a wider range of fish sizes than with 2.25 inch mesh. There is a one million pound quota on commercial harvest of speckled trout.

What does the future look like? Some say this fishery is at a sunrise, others, at a sunset. I think it is at sunrise — the future for the speckled trout fishery is Louisiana is very good. Providing that we can curb the loss of habitat and regulate the fishery as best as possible, we may even have the sportfisherman and the commercial fisherman shaking hands and being buddies. As this species demonstrates, fisheries management means people management using species-specific data to encourage harvest in the best interest of the resource. Speckled trout are short-lived and cannot be stockpiled.

Face the Future: Will You Fish Red Drum?

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The history of red drum fishery management will be a classic success story if we stay on track. Although a serious problem was eminent back in 1986-'87, overfishing and quick actions at the state and federal levels lead to a recovery that is providing an increasing number of fish for harvest. Unfortunately, the management story represents one of the most heated and emotional issues faced by finfish fishermen along coastal Louisiana and that will not change in the immediate future. The heat in the near future will increase as we face questions about where to harvest the fish (in state or federal waters), and how to allocate this resource.

To understand this fishery, lets look briefly at the life cycle of redfish in relation to management decisions, consider the historical perspective on the evolution of the problem and our efforts to understand it, and then conclude with some thoughts about the next few years in this fishery.

Life Cycle Factors For Management

Redfish spawn in the fall, primarily offshore, in 30-80 feet of water. The eggs, embryo and larvae drift inshore, riding the wind-driven currents that occur during the fall spawning season. The young grow up in the estuary, occupying the marsh edge habitat and later open bay, and eventually migrate offshore.

This migration offshore has been a fairly difficult to track. The size of the movement and respective numbers have been elusive. Our studies of redfish have confirmed fish as young as one year old in the offshore population, a significant number of fish are offshore by the time they are four years old, and year-classes are offshore by 6 or 7. We know that this general movement offshore coincides with their maturation and a general slow-down in growth rate.

A red drum is unique in two ways: it is long-lived, living up to 40 years, and fecundity is high. There is a reason that this fish has evolved a strategy to live for 40 years and to reproduce annually for 35 more years. Contrast this to a menhaden that lives two or three years.

We age fish using bones out of the head called otoliths. If you cut an otolith open, it has rings just like a tree. The oldest red drum we have seen to date was about 43 years old, which is a fairly old fish by Gulf of Mexico standards.

Our work on the reproductive biology shows that 50% of a red drum year-class (fish born the same year) is spawning by the time it is four years old. All of a year-class is capable of spawning by the time it is 6 years old. Between 1987-'92 we found that each fish releases 1-2 million eggs per spawning event and the fish may spawn 20 times in a given year. So in any given year, a red drum may release 20 million eggs. It has an incredible potential to produce young for the population in a good year.

There is a reason that this fish 1) lives a long time, and 2) produces billions of eggs over its lifetime. Most of the overfishing that we have seen throughout the world has occurred in fairly long lived species because these fish have evolved a strategy by which that population allows individuals to grow old and reproduce for many years. This reproductive strategy is necessary to replace the population year after year.

We now have a good appreciation for the biology of redfish, however, scientists still debate about stock resolution. The overall and exact size of the resource is still unresolved. We believe that the bulk of the spawning population lives off the coast of Louisiana and some small schools live off Texas and Florida. Do these populations together form one stock of fish for the entire Gulf or many stocks of fish? Geneticists favor the conclusion of one stock of fish. Genetically the fish are no different in Texas and coastal Gulf waters than in Louisiana's coastal waters. There are some subtle differences, but for man-

agement purposes we recognize this as one stock. However, we should recognize for management purposes that there are two interdependent groups of fish separated by life-history stage and management unit: an inshore population and an offshore population. These two groups have different recruitment and escapement components and are state and federal resources respectfully.

History of the Problem

The pending shortfall in nature's production of redfish was first visualized in 1986. Individuals in the population at that time had been born as early as 1952, and we had fish as recent as the 1984 year-class showing up in our surveys. We saw a "hole" in the population between 1976 and 1977 and a low number of fish in that portion of a population graph based on our data.

In terms of human population, a healthy population should have a few old timers and a lot of youngsters. Reduction in the number of individuals in a cohort occurs through natural mortality. But in the red drum histogram, we were initially alarmed because we found very few redfish offshore in these younger age classes. The 1986, '87, and '88 year-classes were not as strong as older year-classes. It was apparent (based on this graph and some information on harvest rates inshore) that fish just weren't getting offshore.

At the time this resource was being hammered by offshore fishermen and there was a public outcry about overfishing. Recreational fishermen were seeing large quantities of redfish being loaded into commercial boats. When the boats were full, the redfish that were left in the purse seine were released. Unfortunately, many dead fish floated off. At the same time, recreational fishermen who had grown up in a 2 or 3 box per day Sportsman's Paradise were taking large numbers of fish inshore. As a result of overfishing by both user groups, strict regulations were imposed.

Since regulations went into effect, the population's recovery has been very quick and actually faster than expected. We continued to follow the recovery through 1992 with federal funding through MARFIN, Sea Grant, and the help of many commercial fishermen and recreational fishermen.

Over a six-year period, a population which did not have many young fish offshore has become dominated by young fish. In 1986, 9% of the fish offshore were less than 9 years old. In 1992, 82% of the fish offshore were less than 9 years old. So management has worked; the younger classes now have the opportunity to escape to offshore into this older population.

Many people asked my opinion of the Louisiana Department of Wildlife and Fisheries (LDWF) report on red drum. I thought it was an excellent piece of work and I'm very proud to have our data as part of that report. LDWF independently predicted the year-class strength offshore based on inshore catch data. Those predictions matched up to our findings. They used their bag, seine, gillnet, and inshore catch data to predict year-class strength of offshore year-classes and it matched our data. Two independent studies came up with the same results and conclusions. The recommendations in the red drum report were sound. The Wildlife and Fisheries Commission choice to be conservative for another year should make the fishery even better for the future. I consider the red drum data that we have available today to be some of the best of any fishery resource that's been studied by scientists to date.

The Future of the Redfish Fishery

The future depends upon the effort made by fishermen to conserve the resource and the effectiveness of allocation and regulation. All fishermen using this resource must work together. Commercial fishermen must organize, come forward with a plan, and try to approach the recreational leaders. For example, they should take a joint proposal to the Wildlife and Fisheries Commission and keep it out of the legislature. They should insist on accurate and clean reporting instead of seeking more enforcement. This is an opportunity for the industry to self regulate and show the other users that they care. Fishermen should turn in the "bad guys," get them to stop because fishermen know who they are. The window is open, but if the user groups don't get together, the resource is going to be lost. The Preservationists' campaign to stop cruelty to fish is another reason for cooperation. In addition, I would encourage the

recreational fishermen to continue to focus some of their efforts toward habitat improvement for this and other species.

Allocation in this fishery involves a decision about where to harvest redfish. Because of the weight-age relationship, one of the classic ways of trying to regulate a fishery — size selection — will be ineffective offshore. After age 10, redfish stop growing significantly, they simply get older, leaving no parameters to differentiate between a 10-year-old fish and a 40-year-old fish. Since this spawning portion of the population has a fairly lengthy longevity, apparently to perpetuate the resource, harvest offshore is unwise. Harvest inshore makes more sense because a controlled number of fish can be taken using enforceable size restrictions prior to migration offshore. The fish are growing very rapidly in the early years so that subtle changes in our management approach can reap very large rewards for those fishermen who are interested in harvesting the resource. Consider some type of limited or controlled entry by true commercial fishermen.

The recreational fishermen have done a fairly good job within their ranks by maintaining some consistency. They have the opportunity to build redfish into a better sport fishery. The recreational industry caught between 8 and 9 million pounds of fish in 1993 with only a five-fish limit. Right now there is a 16-inch size limit. A red fish reaches that length on average at 1 1/2 years old, in the spring (March) of its second year. In two more months, that fish will be about 18 inches. By postponing the harvest of that resource for two months, going to an 18-inch limit, fishermen can catch a significantly larger fish and probably more of them.

Although we know a lot about red drum biology, we must continue to monitor this resource. It will respond to management changes due to the tremendous pool of reproducing individuals offshore. We should monitor it by determining year-class strength inshore, and periodically gathering data offshore to make certain that young redfish get offshore into that spawning population. Landing data should be carefully recorded.

Harvest can be increased because the population size is approaching a reasonable, safe level; there is some excess. An acceptable increase in harvest rate will depend upon allowing a certain percentage of a year-class to escape offshore; we have heard 20, 30, and we are at 60, so I suggest perhaps 40% as a conservative target.

Louisiana has the bulk of the red drum population. The state's fishermen should make our own management choices. We should share our information with neighboring states, but their problems are not our problems.

The Future Is Shaped By Leaders

By Bob Soileau
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In a perfect world, private interest would yield to common interest. In that way the good of the whole would be justly served. Private interest would benefit as a partner, not as a power group. It is commonplace to say, "We do not live in a perfect world, so let us be politically creative." We have learned, especially in this state, that deals can be made, loopholes can be found to award favors to special interests. That this approach leads inevitably to conflict need not be labored.

Leadership is not a science, it's an art. There are certain qualities that make for leadership, but we don't always get them in the leaders that we have. The group attending this workshop is faced with three variables that leadership must address: a major state natural resource, competing interests, and the prevailing political climate.

The first variable is reflected in a debate over who should have access to that resource. Some say the choice depends less on leadership than on self interest. Self interest is valid within certain limits. But when it comes to a natural resource, we cannot rely on self interest. One of the problems being debated by demographers in the world today is how are we going to feed a burgeoning world population with diminishing resources? If this resource isn't managed, its availability to feed future generations will be at risk. So it becomes a compelling leadership problem — not an optional one, a compelling one. It requires courage to face it, intelligence to answer it, and character to support the conclusion. Those are qualities that all of us should possess.

The second variable, competing interests, is always present when there is a resource. Competing interests raise a power question — who should determine how a resource is managed? Competition and rivalry are part of life. We all know that and accept it. Yet when rivalry reaches the level of conflict, damage results, divisions occur, hostility rises, and resolution is difficult if not impossible.

Conflict is resolved by recognizing the validity of competition and accommodation. Competition simply means two or more individuals attempting to realize their self interest. But conflict has a different agenda. In conflict, actions are designed to prevent individuals from doing what they want to do in competition. Conflict is as old as the human race. It is likely to be present where interests compete, and it always results in pain. However deep the conflict, the search for resolution is a part of leadership.

In a major work on social theory, Sorokin said, "I've studied 714 revolutions and they didn't all come out well." Conflicts do not all come out well, and revolution is not an easy task. Accommodation, the mutual adjustment of group goals that allows groups to retain their own identities and interests, is the most effective method of resolving conflict. It involves a temporary adjustment in which competing groups may adapt their goals and viewpoints to immediate reality despite their unresolved differences. The solution is finding what is essential to each group in order to cease hostilities and engage in minimum cooperation. In the coastal fisheries, we must make the survival of the resource the critical factor in our deliberations.

The third variable is prevailing political climate. Politics is the major sport in this state. Too often, the approach that you take in the arena of leadership puts you at the mercy of the prevailing political bartering system. That's fine if political power is on your side, but politics, like the weather, changes. Intelligent forceful leadership tries to avoid this kind of self interest conflict but takes a rational approach that balances resources and self interest.

Its very popular to say that poor communication is the cause of conflict. I disagree. People are at odds because they usually understand each other's self interest quite clearly. Communication only

exacerbates the problem. The solution to the problem is accommodation. In every organization, state, and community there are conflicts in organizations. The most powerful organization can usually wield the most clout. But in conflict, the most powerful can gain by giving. The critical question is: what can you give up? Think about it.

Traditionally, Louisiana's leadership has followed three "Ignorant Rules."

1) Leadership is an opportunity to promote selfish, personal agendas. It has enriched many while leaving the state skewed toward selfish, private interest. It has been reported that this state has received over 10 trillion dollars from oil and gas since the discovery of that resource in Louisiana. If that is true, every state structure ought to be either gold or marble, but instead, they are all crumbling. We have enriched some of the most sophisticated scoundrels in the history of man. Our resources have been taken for the benefit of a few.

2) Leadership is an opportunity to waste resources. Louisiana was once said to be rich in oil, timber, seafood, waterways. Today, most of these are in decline and Louisiana is rich in illiteracy, corruption, and waste.

3) Leadership is an opportunity to promote low standards. We don't set high standards in this state. Nobody looks to us as a model. We promote corruption and ignorance as virtues. As a result, our standards reflect on our intelligence and our character.

If you want this conflict to continue and this resource to be lost, keep on doing what you have been doing; follow the three "Ignorant Rules."

Do you want to change this approach to leadership? If so, you must remember three things:

1) You can't lead in name only. You can't simply occupy space and call it leadership. In the book, *The Fall*, Albert Camu talks about a character named Jean Baptiste Clemente, a lawyer. The first half of that book is a eulogy of Clemente's virtues. Camu tells you how great Clemente is. But the real message begins as Clemente is walking beside the river and he hears a woman's cry. Its coming from the water and he realizes that she is drowning. Leadership was urgent, but Clemente walks away from it. Clemente says of his behavior, "I was absent when I occupied the most space." That characterizes leadership in this state. The people occupying leadership space are absent in integrity, insight, and character.

2)You can't lead part time or in name only. You have to think, plan, accommodate, act on the facts. Leadership is a task in process; it never is completed. In a dynamic society, nothing stays fixed. As a leader, you are called upon to face competing demands and, with wisdom, balance them with principle. That is the price of leadership. The leadership task is never complete.

3) Finally, you can't lead and be everybody's friend. Leadership both divides and unifies. It unifies those who can see the problem and who want to address it with sincerity. It divides those who want to stay in conflict. Leadership has to set its course and leave behind those that cannot come together.

In summary, leadership must look at the resource, the competing interests, and the prevailing climate. Judiciously, leaders must decide when, for the good of the resource, to distance themselves from an idea, position, or group. They may be forced to use power when resolving conflict through accommodation. They must realize that the job is never done and that their popularity is never universal.

That's not only the price of leadership, it is the price of progress.

Steering, Not Drifting, Into the Future

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You were invited here to be challenged with things to think about, and you have heard no simplistic answers to complicated questions. You've looked at the state and federal fishery management processes and learned that they won't work without everyone's participation. You've looked at the processes of making regulations and legislation, so that you all now know how to participate in the process. You heard an in-depth characterization of leadership. I challenge each of you to be a leader. Participate.

I suspect that when some of you came to this workshop entitled "Coastal Fishing: What is the Future?" you wondered, "Is there a future?" My answer to that question is this: Propelled by the wheel of organization and steered by the helm of leadership, yes, there is a future. It will be different. There will be change. Don't be left behind; participate in the process.

The Extension Service may offer more in depth workshops on these topics later this year. If and when that comes about, I urge you once again, participate in the process.