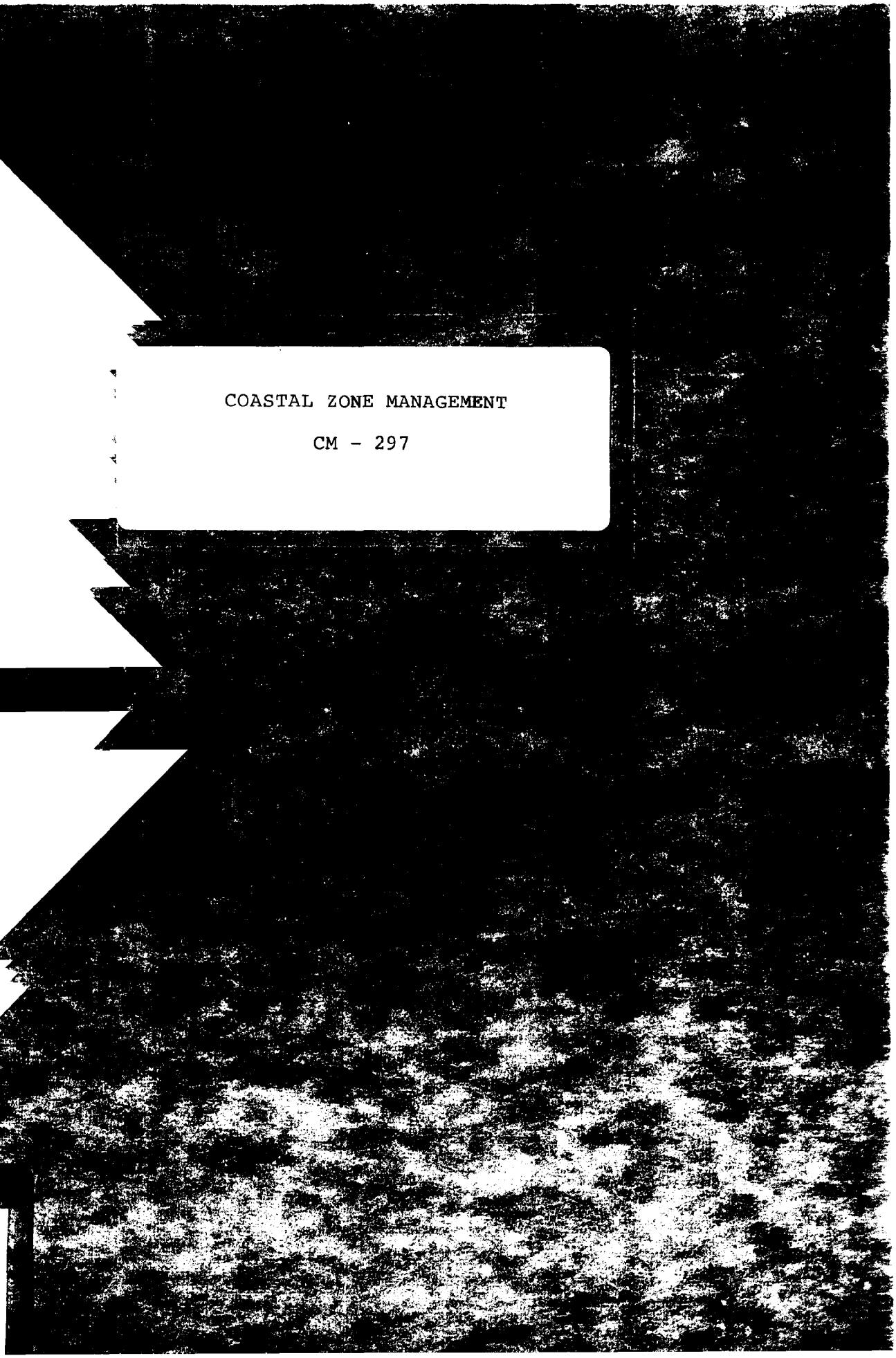
COASTAL ZONE MANAGEMENT

CM - 297



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STATE OF FLORIDA
COASTAL MANAGEMENT PROGRAM

SOCIOLOGICAL RESEARCH OF FLORIDA'S FISHERIES
CM - 297

MARINE FISHERIES COMMISSION
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JANUARY 1991

Funds for this project were provided by the Department of Environmental Regulation, Office of Coastal Management using funds made available through the National Oceanic and Atmospheric Administration under the Coastal Zone Management Act of 1972, as amended.

SH332.2,S72; F6 1991

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EXECUTIVE SUMMARY

SOCIOLOGICAL RESEARCH OF FLORIDA'S FISHERIES

EXECUTIVE SUMMARY

The purpose of this project and final report has been to assist fishery managers, specifically the Florida Marine Fisheries Commission, in incorporating a social science perspective in fishery management decision-making. The need for this perspective became apparent when a Florida Marine Fisheries Commission Rule was challenged by shrimp fishermen on the basis that the commission had not considered the best available sociological data during the rule making procedure. The Florida Supreme Court supported the idea that the commission consider this data in its deliberations.

As a means of meeting the need for anthropological and sociological data, the final report identifies the social science literature that is relevant to fishery management in Florida. A bibliography of this literature was compiled. The bibliography, the Florida Marine Fisheries Commission Social Science Bibliography, includes 2,803 references in a database format for computerized retrieval. Over 300 of these references are annotated. A manual on how to use the bibliography and retrieve references by keywords was developed. A keyword index is included.

At the request of the Florida Marine Fisheries Commission the report provides examples of the retrieval capabilities of the Florida Marine Commission Social Science Bibliography database through the shrimp fishery. One retrieval identifies the literature related to shrimp fisheries in general. A second retrieval identifies the literature related to an issue of particular concern to the management of the shrimp fishery: closure.

The use of social science in fishery management by other states, federal regional councils and state Sea Grants is presented. State and federal fisheries managers are not well aware of the social science research in fisheries nor the social scientists who are experts on fisheries. Fisheries related social science and social scientists are underutilized resources. These points are illustrated by a near total lack of awareness of the only pre-existing social science and fisheries bibliography compiled by the National Marine Fisheries Service and the small number of social scientists actually consulted by fishery managers.

Finally, the report proposes some means of incorporating the social science perspective into fishery management. While fishermen and their fishing behavior may be part of the problem in the conservation of marine species, fishermen really pose the only viable solution to effective, cost-efficient fishery management. The following measures are advocated.

(1) The bibliography developed, the Florida Marine Fisheries Commission Social Science Bibliography, serves as a starting point in identifying the relevant literature and the social scientists who have conducted the research. (2) Fishery managers can expand the base of social science consultants through the development of networks. The bibliography and existing key informants can assist managers in creating a network of social science experts. (3) Social science surveys are proposed as a means of developing profiles of fishermen and their fishing behavior. (4) Incorporating affected fishermen in the development of fishery management plans is proposed. The establishment of standing committees or panels that include representative fishermen is one means of accomplishing this goal.

SOCIOLOGICAL RESEARCH OF FLORIDA'S FISHERIES

BACKGROUND

One of the standards for the Marine Fisheries Commission (MFC) rulemaking requires that, "Conservation and management measures shall be based upon the best information available, including biological, sociological, economic, and other information deemed relevant by the MFC" (Refer to Section 370.025, F.S. Policy and Standards.) Biological and economic information is compiled by DNR and MFC staff. However, sociological information is often limited to the demographic or economic characteristics of the fishery.

The project objective to develop data sources and strategies to better incorporate sociological information into the MFC decision-making process included: (1) development of methods other than the public hearing process to gather data, (2) the development of a bibliography, (3) collect copies of literature for MFC use, (4) create a keyword reference and retrieval system based on Florida's recreational and commercial fisheries, (5) identify current and ongoing research in the area, and (6) review how other states have incorporated such information with emphasis on dispute resolution and information gathering techniques. The result will be used in the next step of shrimp management, the adoption of zone maps.

A rule challenge was filed by shrimp fishermen against a proposed rule of the MFC that would regulate shrimp fishing gear by requiring that turtle excluder devices be used in otter trawls. The challenge did not dispute any of the biological facts in the rulemaking proceeding. The challenge was based on (1) insufficient statutory authority, (2) inadequate economic impact statement, (3) defective notice, and **(4) failure to comply with the standard that mandates the MFC to consider the best available sociological data during the rulemaking process.** The rule challenge was not successful. However, in the Florida Supreme Court decision which mooted the challenge, the Court emphasized the need to comply with the standard that requires consideration of sociological information.

During its initial seven year history, the MFC has relied on the conservation goal. Conservation is the paramount standard of the MFC. However, management decisions are increasingly made which will affect commercial and recreational fishermen without the strong basis in conservation of species. The options for the regulation of spiny lobster and shrimp to create optimum benefit and use are examples of management where socio-economic considerations will be paramount.

SHRIMP MANAGEMENT OPTIONS: ZONE MANAGEMENT

The Florida MFC has been developing a statewide shrimp management plan since 1987 with the aim of protecting and conserving Florida's shrimp resource and providing uniform management where possible. For the purposes of this plan, the shrimp fishery was divided into three user groups: recreational, live bait, and dead production. The first round of rulemaking has been completed and includes allowable gear specifications, net mesh size, and shrimp count. During this round of rulemaking, the MFC made a policy decision to establish allowable shrimp harvesting areas based on zone maps that are being developed by the Florida Department of Natural Resources. A policy decision was also made to set as a goal a 50% reduction of finfish bycatch associated with shrimp trawl activity.

PERMANENT AND VARIABLE CLOSURES TO SHRIMPING:

One technique currently proposed for the conservation and revitalization of marine resources is the establishment of refugia, or marine fishery reserves. The main objectives of marine reserves are to protect spawning stock, intraspecific genetic diversity, population age structure, and assure a recruitment supply. A further benefit is balancing the natural equilibrium of the ecosystem included within the reserve. This concept is not new, having been used in various forms such as sanctuaries, parks, and preserves in the United States as well as other countries.

A marine reserve can be designed around one or more type(s) of management regime(s). These can include closures of nursery areas to protect certain life stages, area closures (e.g. reefs, grassbeds), seasonal closures, rotation of harvesting areas, prohibition of certain user groups and/or gear types, establishment of closed areas for harvest of a particular species, and establishing areas where no harvesting of any kind is permitted (non-consumptive areas). Currently, many of the marine reserve management plans proposed in this country are based on individual species, such as king crab in the eastern Bering Sea, pacific razor clam in Washington state, and abalones in California.

The MFC has chosen to use permanent and variable closures based on a zone mapping regime for shrimp management. These maps contain bathymetric, habitat, and species distribution data. This plan will determine allowable harvesting areas by user group, gear type, water depth, habitat, and occurrence of resource; and will decrease inshore bycatch, and habitat destruction. Closures may be based on area, season, and bycatch species distribution, but it is not perceived that this plan will close all inshore waters to shrimp trawling. An economic assessment of the permanent closure of Florida inshore and near shore waters to shrimp trawling has not been done; however, it is reasonable to assume that such a closure

would impact the inshore fleet with concomitant sociological effects.

Other states in the southeast are using area and/or seasonal closures of inshore waters to manage the shrimp fishery. Georgia uses bait shrimping zones that are opened and closed according to average shrimp size. Georgia also opens the bay portions of their estuaries to food shrimping on a limited scale according to average shrimp size. South Carolina closed Calibogue Sound, Port Royal Sound, St. Helena Sound, and Bulls Bay in 1986 to shrimp trawling year-round. Texas is using a combination of season, zone, depth, and gear to manage their shrimp fishery. Licensed commercial bay shrimpers are allowed to catch shrimp during the periods from August 15 to December 15, and May 15 to July 15.

Chapter 370.156 Florida Statues, designates the inshore and offshore waters of Nassau, Duval, Clay, Putnam, St. Johns, Flagler, Volusia, Seminole, Brevard, Indian River, and St. Lucie Counties as the Florida East Coast Shrimp Bed. Power trawling for dead shrimp in this area is prohibited between April 1 and June 1 of each year. Chapter 46-3.008 F.A.C., prohibits the use of trawls or power operated equipment to catch shrimp in Volusia County year-round. Coastal waters from Horseshoe Beach to Port Inglis (Cedar Key closed area), and from the Steinhatchee River to the Aucilla River have restrictions to the type of shrimp trawls allowed. Other local laws exist that address inshore shrimping in other Florida counties.

In the northwest Florida area, there are inshore waters that presently have either seasonal or year-round closures to shrimp trawling: Escambia Bay north of the I-10 bridge and portions of Blackwater Bay and East Bay, closed from January 1 to September 16; Santa Rosa Sound, closed year-round; that portion of Choctawhatchee Bay east of a line from Four Mile Point to Hammock Point, closed pending DNR sampling; portions of North Bay, East Bay, and West Bay in Bay County, closed year-round; that portion of Apalachicola Bay north of the Gorrie Bridge, closed year-round; and numerous bayous, rivers, and creeks, closed year-round.

BYCATCH REDUCTION:

Finfish bycatch incidental to shrimp trawling has been under investigation for many years. Numerous researchers have compiled bycatch data throughout the Gulf of Mexico; the vast majority of this information pertains to the offshore fishery in the northern Gulf. It is generally believe that the mean finfish to shrimp catch ratio for offshore trawls by weight is 10:1. This ratio varies as a function of location, depth, and season from 2.0:1-21.1:1. In a 1978 Quarterly Report, the Florida Department of Natural Resources personnel reported bycatch results from trawls off Apalachicola, Pensacola, Sanibel, Tortugas, and inside Tampa Bay. The bycatch

percent of total catch for Apalachicola ranged from 85.58%-99.03% (16 trawls); for Pensacola 82.43%-98.48% (14 trawls); for Sanibel 51.43%-91.11% (5 trawls); and for Tortugas 75.89%-95.87% (8 trawls).

Inshore bycatch data is not as abundant as offshore data for the Gulf of Mexico. A study conducted in 1978 indicated the bycatch percent of total catch for Tampa Bay ranged from 74.28%-98.01% (11 trawls). A study of the Galveston Bay bait shrimp fishery indicated that bycatch ranged from 31.1%-60% "or more" of the total catch. Little work has been done on finfish bycatch in the northwest Florida bays and estuaries. Calculations of shrimp/finfish catch data from a study of the St. Andrew Bay system, conducted in the early 1970's, indicated that finfish bycatch ranged from 57%-94% (individual fish/individual shrimp) in the total trawl.

The MFC has been conducting a statewide bycatch study with the assistance of the Florida Department of Natural Resources, the Florida State University Department of Biological Science, and the shrimping industry. When possible, bycatch reduction devices (BRD's) have been tested with the aid of the National Marine Fisheries Service. The primary focus of the project is in estuarine bay systems; however, the near shore area of the Big Bend region is also included in this study. Data being collected includes bycatch species identification, length frequency, total number, and weight percentage of catch. When BRD's are used data are compared to nets without devices in paired tows. This study has been on going since April, 1991, and will continue through June, 1992, thereby giving seasonal replicates for all areas sampled. Upon the completion of this project, data will be added to existing offshore bycatch data, fisheries independent monitoring data, habitat, and bathymetric data to zone maps provided by the FDNR. These maps will then be used as a management tool to determine allowable shrimp harvesting areas.

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INTRODUCTION

INTRODUCTION

Two recent publications by social scientists pertaining to fishery management indicate a growing concern for the state of affairs regarding regulation of marine fishery resources. Crisis in the World's Fisheries (McGoodwin 1990) and "Chaos in Fisheries Management" (Smith 1989) propose an increased awareness of the utility of social science in fishery management and the need for new approaches to policy-making in the use of marine resources.

With the growing demand for seafood, coastal recreation and development, and environmental protection, managers of fishery resources must balance the various and sometimes conflicting wants and needs of different users and publics against the need for conserving the resource. Increasingly, users of these resources have become active in determining how those resources are to be managed. With the addition of environmental restrictions regarding the use of various species of plants, animals, and fishes, the task becomes even more difficult.

Today, fishery management involves more than the equitable allocation and conservation of resources, it has become a process of resource enhancement and crisis intervention. This subtle shift of focus within natural resource policy has increased the number of roles that managers of resources must assume. The contradictory of roles of conservator and allocator of resources often places fishery managers at odds with users or publics.

The variety of roles often require fishery managers to be aware of the number of users or publics and their composition. A

social science perspective that incorporates anthropology and sociology can aid fishery managers in understanding these users of marine resources. The purpose of this project and final report is to assist fishery managers in incorporating this social science perspective into fishery management.

The final report identifies the social science literature that is relevant to fishery management in Florida. A bibliography of this literature was compiled. The bibliography, the Florida Marine Fisheries Social Science Bibliography, includes 2,803 references in a database format for computerized retrieval. A manual on how to use the bibliography and retrieve references by keywords was developed. The report provides examples of the retrieval capabilities of the Florida Marine Commission Social Science Bibliography data base through the shrimp fishery. The use of social science in fishery management by other states, federal regional councils, and state Sea Grants is presented. And finally, the report proposes some means of incorporating the social science perspective into fishery management.

Social Science and Fishery Management

The Fishery Conservation Act of 1976 mandated that social impacts be considered in the development of fishery management policy at the federal level. The mandate stirred considerable interest and research in fisheries among social scientists. Interest and research has grown steadily in the past fifteen

years and given rise to the areas of maritime anthropology and marine social science.

The inclusion of social science at all levels of policy making for fishery management has been a farsighted goal for many social scientists working in the area of marine resource management. However, several impediments to that goal have become clear over the years: 1) social science is often not directed toward the immediate needs of fishery management, therefore it is frequently seen as being irrelevant; 2) because fishery managers are not familiar with the utility of applied social science they overlook opportunities to make use of social science research; 3) there is a general lack of communication and interaction between fishery managers and social scientists; and 4) fishery managers are reluctant to deal with resource conflicts where various users or publics are involved.

Yet, social science can contribute substantially to fishery management. With problem-oriented research, social scientists can produce relevant findings. With the increased multiple use of marine resources, social scientists can contribute an understanding of the sources of conflict and aid in their resolution. With increased public participation in the resource management process, social scientists can familiarize fishery managers with the cultural bases of the participants.

The management of natural resources is becoming an area of growing public concern and participation. Managing those resources in such a way as to satisfy the needs of the public and

the needs of the resource will take careful planning and cooperation between fishery managers and social scientists in the future. Developing the proper tools to meet those needs will require a concerted effort on both parts.

Social Science Research in Florida

While social science research on Florida's fisheries at the state and local level has been small in number, there have been important works on several fisheries and fishing communities. One of the earliest was George Zarur's (1975) work in Mullet Springs (pseudonym). Herbert and Herbert (1979) studied the enactment of local laws concerning fisheries and documented the conflicts that led to their creation.

Lampl's (1986) research Pine Island was an indepth look at the economic impact of the complete closure of the red drum fishery. Because of the importance of red drum to the fishermen, Lampl concluded there would be considerable impact on the level of competition among fishermen as they vied for a reduced number of species. Competition would complicate community relations and increase pressures of overcrowding in other fisheries.

Conflict resolution in the stone crab and shrimp fisheries was addressed in research by Overbey (1986, 1987, 1989, 1991, 1992) and Hammond (1985). Overbey proposed that community level resource management is an alternative strategy for fishery managers to consider. Overbey determined that this informal system is a pre-existing one among fishermen. Local stone

crabbers and shrimpers regulate their fishing behavior through a cooperative system of unwritten rules and norms.

The conflict was not one of stone crabbers versus shrimpers, but, represented a larger conflict between insiders and outsiders. The conflict between stone crabbers and shrimpers occurred when outsiders, in the form of large shrimp boats and newcomer stone crabbers, began fishing local areas and disrupted the traditional form of management, the community-level resource management system. The implications for fishery management are to recognize local systems of resource management and incorporate them into policy when appropriate.

One of the more involved studies using social science in direct relation to fishery management has been Orbach and Johnson's (1987) work with the spiny lobster fishery. In this study, extensive socio-cultural data were collected on the fishery in order to assess the impact of several limited entry alternatives. The investigators, in addition to their ethnographic study, conducted meetings with personnel from the commercial and recreational industry, federal and state management, and academic researchers to evaluate the alternatives recommended. The research exemplifies the utility of social science research and its methodologies to fishery management. Qualitative and quantitative sociocultural data give a more complete picture of the fishery and its participants.

Meltzoff's (1990) work in the Florida Keys examines changes in a fishery due to increased tourism and competition for limited

resources on the islands. The effect of this seasonal inflow of tourists is most apparent in regard to coastal real estate and the allocation of limited resources among temporary populations, the service industry built up to serve that incursion, and the commercial harvesting sector of the seafood industry. The study addresses ways to assist fishery managers in effecting change in local development; the viability of uniting a multi-ethnic fishery; and enhancing the decision making process in allocating limited resources found on the islands.

The term Bluebelting, derived from the practice of granting tax relief to farmers for preserving agricultural land (greenbelting), is used in Bell's (1990) study of marinas and recreational boating needs as a means of offsetting the privatization of water front property. This conversion of waterfront property from water-dependent activities, like marinas, to value enhanced property, such as condominiums, denies public access. The report examines the economic benefits and costs of bluebelting in Florida and the benefits to boaters. Several alternatives are discussed and a preliminary benefit-cost analysis is made for the preferential tax assessment regime proposed by the Blue Ribbon Committee.

In his study of attitudes toward coastal environmental issues, Soden's (1990) research has significance to managers of any natural resource. Because Florida is so dependent upon its coastal resources for its economic well-being, and public participation is mandated in the policy process, surveying public

attitude toward those resources and technical knowledge of coastal resources by that public, can have important implications for management.

Reporting on a statewide survey, Soden identifies three sets of actors in the policy process: general public, activist public, and policy elites. No matter what their position in the process, it is reported that Floridians are concerned about coastal resource management and the ensuing environmental problems. There is disagreement as how to solve those problems through management, however. A wide gap exits with regard to technical knowledge among the three groups of actors, with policy elites having considerable technical knowledge of issues at hand, and the activist and general public having less. Floridians, in general, tend to rely on group sources of information, like special interest groups, and do not seek out new information concerning coastal resources. Television and newspapers are the sources most relied upon, and information that contradicts beliefs is often ignored or rejected. The overall findings challenge the role of public involvement in policy-making for coastal resources, but indicate that public involvement will continue. The question is how to better inform the public and enhance management of coastal resources.

The impact of fishery regulation is often studied in economic terms. Suzanna Smith's (1991) current research on stress and coping strategies provides a new approach to an old problem. It is assumed that regulatory changes within Florida's

net fishing industry are having impacts upon fishing families that are overlooked through conventional approaches to assessment. Smith's study assesses the impact of regulations by focusing on stress and coping strategies employed by fishing families as they face these changes. A sample of approximately 120 net fishing families from various communities along Florida's Gulf coast will be chosen for the purposes of this research. The research will develop an understanding of the different coping strategies associated with perceived stress and identify those groups who may need assistance. The study will provide pertinent information concerning the proper channels through which educational programs, workshops or other means may help fishing families cope with increasing changes in the industry. The study will offer to fishery managers an anthropological or sociological view of the impact of fishery regulation and policy-making.

BIBLIOGRAPHY

THE FLORIDA MARINE FISHERIES COMMISSION

SOCIAL SCIENCE BIBLIOGRAPHY

With the creation of the Florida Marine Fisheries Commission (FMFC) Social Science Bibliography database, the project provides fishery managers a tool to enhance their ability to incorporate the social science perspective into marine resource management. An indication of the high level of interest of social scientists in fishery management is demonstrated by the 859 bibliographic entries with the word "manage" or "management" located in the title or keyword field. The bibliography furnishes a listing of social science publications and gray literature that addresses numerous issues, including fishery management. While not an end in itself, the bibliography places a wide array of issues related to policy in the hands of those who use it.

The Florida Marine Fisheries Social Science Bibliography appears in Appendix 1 as a hard copy of the original software data base. The diskette copies of the data base are included with this final report and are accessible through the use of the enclosed askSam software program.

Manual for Using the Social Science Bibliography

This manual is a brief introduction to the AskSam Information Management system and its application to the Florida Marine Fisheries Commission Social Science Bibliography. It is to provide information for searches and the printing of retrieved material only. For more detailed instructions see the User's Manual accompanying the software. The keyword thesaurus included with this manual is provided to assist with searches. If you are unsure of the terms to be used in the search, turn to thesaurus in the back of the manual.

I. STARTING ASKSAM

A. Two Disk Drives - Insert the Program Disk in drive A and Disk Two in drive B. At the A>, type **AS** and press Enter. Remove the Program Disk and replace with your data disk (a blank formatted disk if you are a first time user).

B. Hard Disk Drive - Change to the AskSam directory, by entering **cd \ASKSAM** at the C:>. You should see the following prompt - C:\ASKSAM>, type **AS** and press Enter.

(Getting Started p. 11)

II. THE STARTUP MENU

You must select a file to work with in AskSam, unless you are going to create one. To select a file, press Enter twice for

a list of files. Move the light bar [**The light bar moves when you depress the cursor arrows**] to the file and press Enter again. AskSam will then move to the Main Menu and you can begin your work.

If your data are in a different directory, then move the light bar to Vary Directory and press Enter or type the letter **V**. AskSam will ask you to specify which directory and filename. You should type in the following information [drivename: directory]. Select a file as you would above. After you have selected a file AskSam will move to the Main Menu.

(User's Guide pp. 41-42)

III. MAIN MENU

SEARCHES

When you have reached the Main Menu you can begin your search for relevant citations within the bibliography. One of the easiest ways to search is through the Query Mode.

(User's Guide p. 50)

Query Mode

Move the light bar to Query and press Enter, or type the letter **Q**. You will now see the Query screen and the cursor will be at the top inside the Query line.

In the Query mode you can retrieve information by simply entering key words. For instance, if you were interested in

shrimp fisheries, you might type **shrimp** and press Enter. AskSam will then retrieve all entries with the word shrimp and highlight the word at least once in each record. Press the space bar to view the next screen. AskSam will place the word -MORE- at the bottom of the screen if there are more records.

When you see -END- at the bottom of the screen you have reached the end of the retrieved records. If you press any key you will return to the Query Request screen. You can return to the Query Request screen at any time by pressing Esc. You may wish to do this if your keyword choice is not retrieving the appropriate records.

(User's Guide p. 99)

If you are unsure of the spelling of a word or you wish to include related words you can use what are called wildcards in AskSam. Wildcards are extensions added to words or partial words which increase the records retrieved by including variants of the word used in the search. By using an * (asterisk) as an extension you can include related words. For example, if you were interested in shrimp, again, and those words related like shrimpers, shrimps, shrimpfishers, we would type the extension **shrimp*** at the query line. This request would retrieve all of those records with shrimp and any variation beginning with shrimp.

An asterisk can be placed before or after a word, i.e., *fish*. But, this search would include such words as selfishness. You must consider the results of using wildcards in

this manner, for you may find yourself with meaningless retrievals. If you were to use the asterisk (*) alone it would retrieve all records in the physical order they were entered.

(User's Guide pp. 101-103)

If you wish to use more than one word in your retrieval there are several ways in which to do so. If you were to type **open access**, only those records with both words, and not necessarily in that order, would be retrieved. If you wish to retrieve records with either word, you would enter **open {or} access**. If you wish to retrieve all records with open access in that order you would type **[open access]**. Note the difference in usage of brackets ([]) and braces ({}). To exclude information use the word {not}, i.e., **FL {not} Gainesville**. This will retrieve all those entries with FL but not those with Gainesville. To display all records in a file enter a colon **:** at the query request line.

(User's Manual pp.104-116)

The information included in the MFC Social Science Bibliography has been entered using templates. A template is a pre-designed format for entering information into an AskSam record. The template for this bibliography consists of the 6 fields listed below with each defined in brackets:

ACCS[{Accession number}

AU[{Author(s)}

YEAR[{Year of publication}

TITLE[{Title of publication}

LOC[{Location of publication}

KEY[{Keywords}

The Marine Fisheries Commission bibliography has one additional field which replaces the KEY[field in the most recent update; it is the abstract field.

Abstract - The abstract field is not an explicit field like those listed above. It is called an implicit field. It has no brackets like an explicit field. The word abstract is the only marker indicating the abstract follows. It is linked to previous record and will be retrieved through keyword searches.

The use of templates allows for the retrieval of specific information, while excluding other information. For example, if you are searching for a particular author, at the Query Request line you would type **Smith {IN} AU[** and press Enter. This request will give you all records with the name Smith in the AU[field. Remember, the AU[field has multiple authors, so Smith will not always be primary author.

(User's Manual p. 116)

Proper searches require the use of proper keywords. **A Keyword Thesaurus appears in Appendix 2.** Continue to search the data base using various keyword combinations until you find the

one which retrieves the greatest number of relevant citations. If you are unsure of words that might be used in the search process, use the Keyword Thesaurus in Appendix 2. Once the best combination has been found the information can be printed.

You may search the bibliography using phrases if you wish. You must remember to place the phrase in brackets ([]) and it must be typed correctly or else it will not be retrieved. AskSam will perform searches using a variety of combinations of words and will also search for words in vicinity of one another. For more information on searches see the User's Guide beginning on page 95.

PRINTING

Printing output is very simple and can be done in several ways:

- Sending output to a printer -

One of the many ways to print output is to simply move the light bar to Print when in one of the retrieval modes. This will print the information as it appears on the screen. If you are in the Query mode and you have entered a keyword, when the information is displayed on the screen move the light bar to the word Print and depress the Enter key. The first record retrieved will be printed. To print the next record you must move to the next screen. Move the light bar to next and press Enter. Repeat the process until you have printed all the records you wish.

(User's Manual pp. 232-234)

To print all the records retrieved with a keyword type **keyword {Print}** at the Query request line. Output will be sent directly to the printer and will be in the format that it was entered.

If you wish information to be printed in a distinct format you must execute a print program that is included in the file you are searching. There are several different print formats in the FMFCBIB. To print in these formats, it is best to send information to the disk first.

- Sending output to a disk -

Sending output to a disk is a simple process. At the main menu select Modify Modes. At the Modify Modes screen move the arrow to the Screen-Printer-Disk mode. Place the arrow next to the disk mode using the Enter key. You will be asked to name a file. Type in whatever name you wish to label the new file and hit the Enter key. Now hit the Esc key and press Y to save changes.

Another way to send output to a disk is to enter this command at the query line: **{disk c:\asksam\fish.txt}**. This will create a file named fish.txt in the directory \asksam on the C drive. At the query line your search retrieval will be sent to that file. If you wish your search to be printed in a particular style, then you must include the print program with your search, i.e. **fish {or} :prn1**. This request, submitted after the disk command will send your retrieved records to the file designated fish.txt and will also include the print program :prn1.

Next, you must create a new file by typing C at the main menu. When prompted, you will want to spawn initial file settings rather than create an entirely new file. Once you have done this, you will import the file fish.txt into the newly created file by typing in the directory location (**C:\asksam\fish.txt**) when prompted for the file name to import. You will be asked to do this once you type the letter I for importing.

Once you have imported this file, return to the main menu and make sure you have the newly created file as the current file. Press M for modify modes and choose printer for choice of where to send output. Save changes by pressing Esc and then Y. You then press E to execute the print command and type :prn1 and the your retrieved records will be printed in the format you have chosen.

:PRN1 OUTPUT

Johnson, J.
1985 Migratory Fishermen: A Case Study in Interjurisdictional Natural Resource Management. Ocean & Shoreline Management 13(3-4):231-252.

[With Abstract]

:PRN2 OUTPUT

Johnson, J.
1985 Migratory Fishermen: A Case Study in Interjurisdictional Natural Resource Management. Ocean & Shoreline Management 13(3-4):231-252.

[Without Abstract]

:PRN3 OUTPUT

0673 Johnson, J., (1985). Migratory Fishermen: A Case Study in Interjurisdictional Natural Resource Management. Ocean & Shoreline Management 13(3-4):231-252.

The askSam information management system is very versatile, but, you must practice using it. If all else fails, hit Esc. This will usually return you to the main menu and abort any search or program you have started. The user manual is difficult to use, at times, but keep searching. Use the examples that are presented in the manual for templates to do many of the things you wish to accomplish.

FLORIDA SHRIMP
FISHERY

THE FLORIDA SHRIMP FISHERY:

AN EXAMPLE OF A SOCIAL SCIENCE LITERATURE SEARCH

In order to demonstrate the utility of the Florida Marine Fisheries Social Science bibliography database, the report identifies issues in the upcoming Florida Marine Fisheries Commission Shrimp Management Plan. The various uses of the bibliography are illustrated through a step by step process of searches for relevant material within the social science literature concerning the management of shrimp fisheries. In addition to literature pertaining to shrimp fisheries, the search includes material that is relevant to shrimp fishery management. Specific issues, such as, closures, access, dislocation of populations, conflict over resources, multiple users; and social science methodology are determined. Through the literature search and discussion of pertinent research, the utility of social science research at every level of fishery management is illustrated.

The Florida Shrimp Fishery

The Florida shrimp fishery can be characterized as consisting of three components: inshore, nearshore, and offshore. Within each of these components is a combination of food, bait, and recreational shrimpers. The type of gear and size of boat vary with both type of shrimp and area fished. It is not unusual

to find any one of the three types of shrimpers in any one of the three component areas.

The Florida Marine Fisheries Commission Shrimp Management Plan has been drafted to provide protection and conservation of Florida's shrimp resources and to eliminate inconsistent local regulation of shrimp harvest, thereby providing more uniform management rules for the harvesting of shrimp in state waters. In order to accomplish this, the Marine Fisheries Commission has adopted these management measures: 1) areas - creation of five regions within the state for the purpose of specifying allowable gear and redefinition of the Tortugas shrimping boundaries; 2) season - extension of the east coast closed season for April and May for all shrimp fishermen; 3) gear - establishment of statewide standards for bait shrimpers with some exceptions, repeal of local law to establish regional design standards for food shrimp fishermen, and specification of allowable gear for recreational shrimping; 4) size - creation of a statewide 47/70 average size limit for harvesting food shrimp; and 5) bag limit - establishment of a statewide daily recreational bag limit of five gallons, heads on, per person (FMFC 1991).

Shrimp Fisheries and Social Science Research

Searching the social science data base in askSam is relatively easy using the keyword search process. By entering **shrimp*** at the query line 75 entries pertaining to shrimp are retrieved (see Appendix 3.) The asterisk is used to include all

forms of words associated with shrimp, such as, shrimpers, shrimping, etc. If the user feels that this search includes too many irrelevant entries, then the search can be modified by hitting the escape key until the query screen returns and using whatever form of the word thought to be appropriate. It is advisable to use the keyword thesaurus (see Appendix 2), for appropriate search terms.

A cross-referenced search can be conducted for specification. If the search were limited to the terms **shrimp* {and} manage***, approximately 16 entries would be retrieved. Once the user has found the appropriate search terms the entries can be printed simply by moving the light bar to **{print}**. However, this command will print each entry as it exists on the screen. If the user wishes to have the search printed in a particular bibliographic style, then one of the executable commands included in the bibliography should be used instead (See manual.)

A review of the 75 citations retrieved indicates a wide range of topics from several disciplines including anthropology, sociology, economics, political science and geography. By far the greatest number of entries addresses various aspects of the economics of shrimp fishing (Bruenmeister 1984; Conroy and Poffenberger 1985; Danville Research Associates 1982; Doll 1972; Dudley and Waugh 1980; Griffin and Nichols 1976; Griffin et al. 1973, 1976, 1977, 1983; Hu et al. 1983; Kellogg 1986; Korson 1984, 1985; Poffenberger 1982, 1983, 1983a, 1984, 1986; Prochaska

and Cato 1981). Many of the entries concern specific issues of regulatory impact like the outlawing of unions in Mississippi (Durrenberger 1991); the Lacey Act in Texas (Crouch 1989; Crouch and Miller 1987; Maril 1984); the Texas Closure (Nance et al. 1989; Nance and Garfield 1988; Poffenberger1986, 1984, 1983, 1983a, 1982; U.S. Department of Commerce 1986) and Turtle Excluder Devices (Durrenberger 1988; Dyer and Moberg 1991; Kitner 1987; Laska and Margavio 1989; Margavio et al. 1991; Moberg and Dyer 1990; White 1989). The remainder of those items retrieved concern a wide variety of topics from general socioeconomic surveys of bay or gulf shrimp fisheries (Crowe 1987, 1986) to specific behavior of shrimp fishermen (Eales 1983; Eales and Wilen 1986; Formichella and Thomas 1989).

While many of the entries listed in Appendix 3 may not be considered directly relevant to the Florida Shrimp Management Plan, they do address several aspects of shrimp fishing and behavior of shrimp fishermen that can be informative. Certainly the citations by Overbey (1989) and Hammond (1985) concerning the stone crabbers and shrimpers dispute in Florida are appropriate and discuss important issues related to conflict resolution. But more general surveys by Acheson (1976), Nix (1980, 1982), Baxter et al. (1984), and Maril (1983) provide important overviews of the fisheries studied and should be consulted. General surveys such as those mentioned can provide a basis for further research by developing a profile of the fishery and identifying certain methodologies (Maiolo and Johnson 1989) to be used in the future.

With little knowledge of users, fishery managers are limited in their capabilities for data gathering and further analysis. This is especially true with regard to social science data.

Having retrieved these examples by using the general keyword "shrimp," the next step is to focus on an issue. The Florida Marine Fisheries Commission Shrimp Management Plan addresses a number of issues, but, one that might be of concern here is the issue of displacement or access to fishing grounds.

With the establishment of closed areas, many fishermen may be displaced from traditional fishing grounds. The impact of this closure can affect fishermen in many ways. To assess the varied effects of such a closure, it would be advisable to search the bibliography for material that is relevant to this issue. The keyword "closure" is too narrow a term to search. Other words like "access" should probably be included. However, access may be too general and retrieve too many irrelevant citations.

One issue that encompasses various aspects of closure is "interjurisdictional management." Many times, closure in one state or country will create hardships for fishermen who normally would travel from their traditional fishing grounds to fish other areas during seasonal changes. One of the most often cited in Appendix 4 is the Texas closure (Conroy and Poffenberger 1985; Nance, et. al. 1989; Nance and Garfield 1988; Poffenberger 1982, 1983, 1984, 1986; and U.S. Dept. of Commerce 1986). The other citations listed in Appendix 4 are generally concerned with interjurisdictional management and would give some insight into

the problems associated with this type of management problem. It is often the migration in response to a closure that can cause further problems in fishery management. Increased competition from other fishermen often causes conflict when migration from one fishery to another takes place.

OTHER STATES
AND REGIONS

[redacted]

SOCIAL SCIENCE IN OTHER STATES AND REGIONS

Scope of the Study

A total of 43 agencies were contacted, representing state marine fishery management divisions, federal regional fishery management councils and state Sea Grant offices. In almost all cases, interviews were held with directors or executive directors of the organizations concerned.

Nineteen fishery management divisions in eighteen states were contacted. These included the Alabama Marine Resources Division, Connecticut Bureau of Fisheries and Wildlife, Delaware Division of Fish and Wildlife, Georgia Coastal Resources Division, Idaho Bureau of Fisheries, Louisiana Department of Wildlife and Fisheries, Maine Department of Marine Resources, Maryland Fisheries Division, Massachusetts Division of Marine Fisheries, Mississippi Bureau of Marine Resources, New Hampshire Inland Fisheries Division and Marine Fisheries Division, New Jersey Division of Fish, Game and Wildlife, New York Division of Marine Resources, North Carolina Division of Marine Fisheries, Pennsylvania Fish Commission, Rhode Island Division of Fish and Wildlife, South Carolina Department of Wildlife and Marine Resources, and Virginia Marine Resources Commission.

Six regional fishery management councils were contacted. They included those for the New England states, Mid-Atlantic

states, South Atlantic states, Gulf of Mexico states, North Pacific states, and Pacific states.

Sea Grant programs in 18 states were also contacted. They included The Alabama/Mississippi Sea Grant, Alabama Sea Grant Extension Service, Mississippi Sea Grant Extension Service, one of the two California Sea Grant offices, Connecticut, Delaware, Georgia, Louisiana, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Oregon, Rhode Island, Texas, Virginia, and Washington.

A total of eighteen state fishery managers (in nineteen offices), eighteen Sea Grant programs and six regional fishery management councils were thus contacted.

Three areas of query were analyzed. 1. Managers were asked if they incorporate in their management plans or research agendas. 2. Managers were asked if they use social scientists in the course of their work. 3. Managers were asked if they were aware of the only previously existing social science and fisheries bibliography, compiled by Peter Fricke, social anthropologist at the National Marine Fisheries Service (NMFS) in Washington, D.C. Fricke also produces a newsletter for a network of social scientists in fisheries and fishery managers.

The results of the survey are presented in Table 1 and described below.

Incorporation of Social Science Research

Of nineteen state-level offices, five (26%) incorporate social science in their planning for fishery management. Five of

the six regional councils, or 83%, incorporate social science. Eleven (61%) of the eighteen Sea Grant offices usually fund social science proposals.

Use of Social Scientists

Ten of nineteen state-level offices, or 53%, consult with social scientists. All six of the regional management councils use or consult with social scientists. Nine of the eighteen Sea Grant programs (50%) consult with or fund social scientists.

Awareness of NMFS Bibliography and/or Network

No state-level directors stated that they were aware of the social science network or bibliography produced by Peter Fricke of NMFS. Only one of eighteen Sea Grant directors (5%) knew of Fricke's work. Among directors of regional councils, however, two of six (33%) knew of the bibliography and network.

Conclusions

State-level managers noted that social science research was expensive and that funds were only available at the regional and national levels for such research. They were not aware of social science research that addressed issues relating to fishery management. For many, fishery management consisted of protecting and managing the resource, and not the users of the resource. One state-level manager stated that "the fisheries community is insensitive to the social or economic impacts of its decisions". However, another state-level manager noted that "everybody in fisheries management uses social science. They may not recognize it, but it's half the equation".

Managers at all levels tended to view economics as the only social science relevant to fishery management. This viewpoint was most prevalent at the state level. While many state-level managers also felt that no appropriate social science research was available, few had actively investigated what was available. At the federal regional council level, use of social science research is mandated, which probably accounts for the relatively large number of councils incorporating social science (83%) and using social scientists in some capacity (100%). Among Sea Grant directors, those who funded social science projects often had reservations about how best to utilize the data which was generated. Some felt that social science proposals were not well designed when compared with those coming from "hard" scientists.

Many managers at all levels stated that they saw at least some need for social science input into fishery management. Often remarks of this sort were followed by complaints about the dearth of good social science research in aspects of fishery management. However, almost none of the managers were aware of the existing resources. Only three agencies of the 43 (7%) were aware of the NMFS bibliography or network.

Social scientists themselves were an underutilized resource. Although 24 of the 43 agencies indicated that they used social scientists, the actual social scientists mentioned was small. When managers did call upon social scientists, they generally relied upon one or perhaps two social scientists in fisheries

research with whom they had previous personal contact. These social scientists served as key informants to the managers.

TABLE 1

SOCIAL SCIENCE USE IN FISHERIES MANAGEMENT

	Incorporate Social Science	Use Social Scientists	Aware of NMFS Bibliog.
States N = 19	5 = 26%	10 = 53%	0
Councils N = 6	5 = 83%	6 = 100%	2 = 33%
Sea Grants N = 18	11 = 61%	9 = 50%	1 = 5%
Total N = 43	21 = 49%	24 = 56%	3 = 7%

INCORPORATING
SOCIAL SCIENCE

INCORPORATING SOCIAL SCIENCE IN FISHERIES MANAGMENT

The research and final report serve as a first step in realizing the long term goal of successfully incorporating social science in fishery management. As the previous section has illustrated, despite nearly 15 years of interest and research in fisheries by social scientists, social science data has not been effectively integrated into fishery management at the state nor national level.

Fishery management is still dominated by biologists and biological models of management that focus on managing the marine species rather than the fishermen who catch the species. Yet, successful management of the species relies nearly solely on the managing of technology and the behavior of fishermen. The title of an article by anthropologist Miller (1979) aptly states the situation: "Boats Don't Fish, People Do."

Social science contributes to effective fishery management by dealing with the human dimension of fisheries: the fishermen themselves. Without a clear understanding of the fishermen who harvest the marine species, their behavior and the attitudes and motives that shape that behavior, and an effort on the part of managers to tailor their plans accordingly, fishery management strategies will fail. Fishermen will ignore the regulations, requiring costly enforcement of planned regulations. While fishermen and their fishing behavior may be part of the problem in the conservation of marine species, fishermen really pose the

only solution to effective, cost-efficient fishery management. Fishery managers must develop better ways to incorporate fishermen and their fishing behavior in the development of management plans. Here, the social scientist can help.

A case in point is illustrated by the over-fishing behavior characterized in Hardin's "Tragedy of the Commons" (1968). While the work of some social scientists supports this assumption of fishermen as rational, economic men who always maximize their efforts (McCay and Acheson 1987), the work of other social scientists dismisses the assumption (Overbey 1989, 1991; Acheson 1987; Sinclair 1989).

These studies illustrate that fishermen act to conserve the resource for the longevity of the species and their livelihood. The social science research demonstrates the variability of fishing behavior and attitudes regarding the resource and suggests that fishery management plans take this variability into account.

Given the applicability of social science to fishery management, how do managers go about incorporating social science into fishery management plans?

1. Bibliography - the Florida Marine Fisheries Commission Social Science Bibliography serves as a starting point in identifying the relevant literature and the social scientists who have conducted the research.

2. Social Scientists Network - Fishery managers can build on the base of social science key informants that they have

already developed. Through the literature search of the bibliography managers can indentify other social scientists who have the expertise to advise them on the fisheries or related issues.

3. Surveys - Obvious gaps in the literature cited in the bibliography indicate the need for further information on the fishermen and their fishing behavior in Florida and the nation as a whole. The variability of fishermen and their fishing behavior further supports the need for additional social science research. One means of developing profiles of fishermen is through surveys of fishing populations. Social scientists can design and collect the appropriate data necessary to understanding the human dimensions of fisheries.

4. Fishermen - Successful fishery management will incorporate the affected fishermen in the development of fishery management plans. The establishment of standing committees or panels that include representative fishermen is one means of accomplishing this goal. Social scientists can help managers in determining the affected fishermen and identifying those fishermen who are most representative of the fishery.

Ideally, fishery management should adopt all of these measures in order to incorporate the social science perspective in the decision-making process. The research advocates the further development of this approach to management of marine species. We believe that effective fishery management will

result from access, communication and integrated decision-making among managers, social scientists and fishermen.

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APPENDIX I

APPENDIX 1

FLORIDA MARINE FISHERIES SOCIAL SCIENCE BIBLIOGRAPHY

PLEASE SEE THE

ENCLOSED DISK

FOR INFORMATION

CONCERNING THE BIBLIOGRAPHY

APPENDIX 2

APPENDIX 2

KEYWORD THESAURUS

This keyword thesaurus is a revision of the keyword listing for the National Marine Fisheries Social Science Data Base in the manual written by Ken Johnson. Key words in the NFMS data base have slight variations (often a hyphen {-} connecting two words) and should be included in your search to insure that all pertinent material is retrieved.

A

Abalone	Shellfish
Access	Use rights; TURF; territoriality; interjurisdiction
AID	Agency for International Development; assistance to developing countries; USAID
AK	Alaska
AL	Alabama; Gulf states
Aleut	Aleut Nation of Alaska; Aluet people
Allocation	Allocation of fishery and other resources between users; quota; limited entry; L/E; turf
Amoco Cadiz	Amoco-Cadiz; Oil spill/shipwreck; pollution;
Anadromous	Herring, salmon, steelhead trout, etc.
Anchovy	Anchoveta
Angler Success	Angler-Success; success rate or catch rate; effort
Antarctic	
Anthropology	Cultural and social anthropology; social science

Antilles	Caribbean islands
Antitrust	Antitrust laws (U.S.)
Applied	Applied research; application of technique; praxis; Society for Applied Anthropology
Aquaculture	Mariculture; pond-raised
Archaeology	Marine Archaeology; Archaeological; prehistory;
Arctic	
Artisanal	Subsistence fisheries; small-scale; labor-intensive; traditional; inshore
Artificial reefs	Artificial-reef; Fish attractors;
Asia	
ASMFC	Atlantic States Marine Fisheries Commission
Atlantic	Atlantic Ocean
Attitude	Individual attitudes; perceptions; norms; values; mores
Austrailia	

B

Baitfish	Fish used for bait; bait fishermen; bait shrimpers; baitshrimp
Barrier	Barriers to trade
Barrier Islands	Barrier-Island; offshore islands of sand subject to erosion

Bass	Freshwater - largemouth, smallmouth, striped bass; saltwater - seabass
BC	British Columbia; Canada
Beach	Shoreline; access
Beaufort Sea	Beaufort-Sea
Belgium	Europe
Belize	Central America; Caribbean; Gulf of Mexico
Benefit	Social or economic benefit
Bering Sea	Bering Straits
Bibliography	Publication cited is either a bibliography or contains a substantial bibliography
Bioeconomics	Biology; economics; bioeconomic model
Biology	Natural sciences
Biotechnology	
Bluefish	
Boat	Recreational or small commercial fishing vessel
Boldt	Justice Boldt decision; allocation of Northwest Pacific Salmon fisheries between Native American tribes and other fishermen; salmon; tribe
Boundary	National boundaries
Bristol Bay	Bristol-Bay; Alaska

C

CA	California
Capacity	Fishing power of commercial fishing vessels
Capelin	Capelin fish
Capital	Money invested; capital investment; capital venture
Caribbean	Caribbean Islands
Catch	Commercial, recreational, subsistence harvest; take
Catfish	Aquaculture; freshwater fish
CFMC	Caribbean Fishery Management Council
Charterboat	Charter-boat; head boat; party boat; recreational fishing boat for hire
Chesapeake	Chesapeake Bay; Virginia; Maryland
Chile	South America
China	People's Republic of China; Asia
Christmas Island	Christmas-Island
Ciguatera	Fish poisoning
Clam	Shellfish; hard clams; soft clams; surf clams
Closure	Closure of fishery; closed area to fishing activity; interjurisdiction

Co-Manage	Co-management; comanagement; co-operative management
Co-op	Co-operative; co-operatives for harvest; co-operatives for marketing and supplies
Cod	Cod fish
Cod-end	Gear; trawl
Collision	Vessels colliding; with other objects
Columbia	Columbia River region; Oregon, Washington and Idaho
Commercial	Commercial Activity associated with a fishery
Common Property	Common-property; Communal property; open access; privatization
Community	Town; village; coastal community
Conflict	Dispute over allocation or fishing ground; Conflict management; resolution; mediation
Congress	Congress of United States
Conservation	Conservation of resource; conserve; ecology
Consumer	Consumption
Cook Inlet	Cook-Inlet; Alaska
Cost	Social or economic cost
Costa Rica	Costa-Rica
Council	Regional Fishery Management Council

Crab	Shellfish
Crayfish	Aquaculture
Cree	Cree Indian Tribe
Crew	Crew of vessel
Criminology	
CT	Connecticut
Cuba	Caribbean
Culture	Societal or group norms and values
CZM	Coastal Zone Management; Coastal Zone Management Act

D

Dam	Hydroelectric power
Dare County	Dare-County; North Carolina
Data	Information set
DE	Delaware
Decision	Decision-making; decision model
Demand	Economic demand
Demography	Population structure
Denmark	Europe
Development	Develop; developing; fisheries development
Diet	Nutrition
Discount rate	Discount-rate; financial transaction

E

Earning	Earnings
East Africa	Africa
Ecology	Ecosystems; habitat; cultural ecology
Economic	Economics; bioeconomics; economy
Ecuador	South America
Education	Educational
EEC	European Economic Community
EEZ	Exclusive Economic Zone
Efficiency	Economic efficiency
Effort	Fishing effort
EIS	Environmental Impact Statement
Employment	labor opportunities
Enforcement	Fisheries regulation
ESA	Endangered Species Act;
Ethics	Morals; values; conservation
Etiology	
Evaluate	Evaluation
Export	Trade; import/export

F

F/AKR	NMFS Alaska region
F/NER	NMFS Northeast region

F/NWR	NMFS Northwest region
F/SER	NMFS Southeast region
F/SWR	NMFS Southwest region
FAO	Food and Agriculture Organization of the United Nations
FCZ	Fishery Conservation Zone
Fee	License fee;
Fiji	Pacific
Finfish	Pelagic; demersal
FL	Florida
FMP	Fishery Management Plan
Foreign	Foreign nations; foreign nationals;
Forest	Forestry; Forest Service
FPC	Fish protein concentrate
Fuel	Fuel for vessels or boats
Fundy	Bay of Fundy; Gulf of Maine

G

GA	Georgia
GAO	General Accounting Office
Gear	Fishing gear; equipment
Geography	Geographic
Geology	Geologic
Georges Bank	Georges-Bank
GFMC	Gulf of Mexico Fishery Management Council

GIFA	Governing International Fisheries Agreement
Gillnet	Gear; nets
GLFC	Great Lakes Fishery Commission
Groundfish	Bottomfish
Grouper	Seabass; scamp; gag; jewfish
Guideline	Instructions
Guinea Bissau	Guinea-Bissau
Gulf	Gulf of Mexico; GFMC; Alabama; Florida; Louisiana; Mississippi; Texas

H

Habitat	Ecology
Halibut	
Harvest	Capture; take; artisanal; commercial; recreational
Herring	Menhaden
HI	Hawaii
History	Historical

I

Iceland	Icelandic
ICES	International Council for Exploration of the Sea
ICJ	International Court of Justice; World Court
ID	Idaho

IDOE	International Decade of Ocean Exploration
IMO	International Maritime Organization of the United Nations
Impact	Impact study; economic impact; social impact
Import	Goods imported; import/export
Income	Earnings; Personal; business; national
India	Indian subcontinent
Indian	Native American; tribe
Indonesia	Asia
INPC	International North Pacific Fisheries Commission
Inshore	Subsistance; artisanal; traditional
Insurance	Liability
Interjurisdictional	Management of transboundary fish stock; access; closure
Inuit	Inuit peoples; Eskimos
Invest	Investment
Ireland	United Kingdom; U.K.; Northern Ireland
Israel	Jewish State
IWC	International Whaling Commission
IXTOC-1	Oil spill; pollution

J

Jamaica	Jamaican
Japan	Japanese
Joint Venture	

K

Kin	Kinship; kinship networks; community
Kiribati	
Krill	Antarctic
KY	Kentucky

L

LA	Louisiana
Labrador	Canada
Lacey Act	Lacey-Act
Lake Erie	Lake-Erie; GLFC
Lake Michigan	Lake Michigan; GLFC
Land Use	Land-use
Latin America	Latin-American
Law	
License	Fee; quota; limited entry
Limited Entry	L/E; closed access schemes; license; fee; common property; co-management
Lobster	American Lobster; Spiney Lobster
Longline	Gear; fishing gear

Law of the Sea	United Nations Conference on Law of the Sea

M

MA	Massachusetts
Mackerel	
MAFMC	Mid-Atlantic Fishery Management Council
Malaysia	Asia
Malta	
Manage	Management; fisheries management
Marina	Recreational boat harbor
Market	Market for fish or fishery products
MAS	Marine Advisory Service of Sea Grant; Sea Grant
MD	Maryland
ME	Maine
Mediation	Mediate; conflict resolution; mediator
Menhaden	Herring
Mesh	Mesh size; gear
Method	Methodology; research methods; models; modeling
Mexico	Central America
MFCMA	Magnuson Fishery Conservation and Management Act
MI	Michigan
Milkfish	

Mineral	Ocean mineral deposits; sand or gravel mining
Mitigation	Compensatory action for habitat loss
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service of U.S. Dept. of Interior; OCS; oil; minerals
Monitor	USS Monitor; archaeology; wreck
Morocco	Africa
MS	Mississippi
Multi-species	Multi-species management
Muskellunge	Muskie
Navigation	Shipping; Law of the Sea
New Brunswick	Canada; NB

N

NC	North Carolina
NEFMC	New England Fishery Management Council
NEPA	National Environmental Policy Act
New Bedford	New-Bedford
New Calidonia	New-Calidonia
New Zealand	Newzealand
Newfoundland	Canada; NFLD
NH	New Hampshire

NJ	New Jersey
NMFS	National Marine Fisheries Service
NOAA	National Ocean and Atmospheric Administration
Non-market	Social values; economic values
North Sea	North-Sea
Norway	Europe
NPFMC	North Pacific Management Council
Nova Scotia	Canada; NS
NY	New York

O

Observer	Foreign or domestic fishing observer
Ocrakoke	North Carolina
OCS	Outer Continental Shelf
OH	Ohio
Oil	Offshore oil and gas exploration; rig; pollution; artificial reef
Ontario	Canada; GLFC
OR	Oregon
Otter	Sea Otter
OY	Optimum yield
Oyster	Shellfish

P

Pacific	Pacific Ocean
Panama	Central America
Papua New Guinea	Papua-New-Guinea
PEI	Prince Edward Island
Pelagic	Fish species
PFMC	Pacific Fisheries Management Council
Phillipines	Asia
Plan	Planning; policy; fisheries management plan
Policy	Policy studies; policy issues; policy development
Pollution	Oil; PCB's; chemical; pesticides; thermal; sewage
Polsci	Political Science; government studies
Porpoise	Sea mammals
Port	Harbor
Portugal	Europe
PR	Puerto Rico
Prawn	Shrimp; crayfish; rock-lobster
Prehistory	Archaeology; prehist
Pribilof Islands	Alaska
Price	Value
Process	Processing; processor

Proclamation	Truman Proclamation
Profit	Income; earnings; value
PSMFC	Pacific States Marine Fisheries Commission
Psychology	Psych

Q

Quality	Diet
Quebec	Canada
Quota	Limited entry; license; co-management

R

Recreational	Boat; harvest; tournament; Rec
Redfish	Red drum
Reef	Artificial reef; rig
Reef fish	Grouper; snapper; reef-fish
Regulation	License; fee; specific actions
Rent	Economic return
Research	
Resource	Fishery or other natural
Revenue	Earnings; income; profit
RI	Rhode Island
Rig	Oil; gas rig; oil well
Risk	Economic risk; insurance; liability

Roanoake	Roanoake River; North Carolilna

S

Safety	Vessel; insurance; liability
SAFMC	South Atlantic Fishery Management Council
Salmon	Salmonid
Saltonstall-Kennedy	S-K;
Sanctuary	Marine Santuary;
Sardine	Anchovy; anchoveta
SC	South Carolina
Scallop	Sea calico; bay scallop
Sciaenid	Species; red drum
Science	Fisheries science
Scotland	United Kingdom; U.K.
Sea bed	Mining; Minerals
Seal	All species
Seine	Net; gear
Senegal	Africa
Sea Grant	SG; NOAA
Shark	All species
Shellfish	All species; abalone; crab; clam; oyster; shrimp
Shipbuilding	Ship repair
Shipping	Merchant shipping
Shrimp	All species

SIA	Social Impact Assessment
Sierra Leone	Africa; Sierra-Leone
Skipjack	Sailing vessel for oystering; Chesapeake
Snapper	All species; reef fish
Sociology	Soci; socio-cultural
Social scientist	Social-scientists
Socialization	Enculturation; social roles
Solomons	Solomon Islands
Southeast Asia	Southeast-Asia
Spain	Europe
Squid	All species
Sri Lanka	Sri-Lanka
St. Barths	Caribbean; St-Barths
Start Bay	United Kingdom; Start-bay; Devon
State	States
Steelhead	Trout; anadromous
Stock	Fish stocks
Stone Crab	Crab; Stone-crab
Straits	Narrows; sounds; navigation
Striped bass	Rockfish; anadromous; striped-bass
Subsidy	Fund
Surimi	Minced fish product; analog fish product
Survey	Data; research survey

T

TALFF	Total Allowable Level of Foreign Fishing; foreign; allocation; quota; fee
Tariff	Trade barrier
Thailand	Asia
Theory	Theoretical
Third World	Developing countries; third-world
Tilapia	Aquaculture;
Tournament	Recreational fishing; fishing derby
Trade	Exchange;
Trawl	Net; vessel; gear
Treaty	Concord; pact
Tribe	Native American; Native Canadian; Traditional
Troll	Trolling; gear
Trout	All species
Tuna	All species
Turf	Territory; use rights; community defined; traditional use rights
Tuvalu	
TX	Texas

U

UK	United Kingdom
Uncertainty	Risk; economic risk

UNCLOS	United Nations Conference on Law of the Sea
Unions	Union; guild
Urban	Recreational fishing in metropolitan area
US	United States; U.S. Federal Government
USCG	United States Coast Guard
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Services
USSR	Union of Soviet Socialist Republics
USVI	United States Virgin Islands

V

VA	Virginia
Value	Social or Economic value
Vanatu	
Vessel	Fishing vessel; boat
Vietnamese	Vietnamese fishermen; refugee; migrant
Vulcanism	Volcanic activity

W

WA	Washington
Walrus	
Water quality	Water-quality
Waterfowl	

West Africa	West-Africa
West Germany	West-Germany; Europe
West Pacific	
Wetland	Marsh; swamp; ecology; habitat
Whale	All species
White fish	White-fish
WI	Wisconsin
WPFMC	Western Pacific Fishery Management Council
Wreck	Shipwreck; collision

Y

Yield	Optimum yield; Maximum Sustainable Yield; Maximum Economic Yield; OY; MSY; MEY

APPENDIX 3

APPENDIX 3

SHRIMP FISHERIES AND SOCIAL SCIENCE RETRIEVAL

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APPENDIX 4

APPENDIX 4

CLOSURE AND INTERJURISDICATIONAL RETRIEVAL

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[redacted] NTIS FORM 272

REPORT DOCUMENTATION PAGE

1. Report No. DNR Contract No.X-0476

2.

3. Recipient's Accession No.

4. Title and Subtitle
STATE OF FLORIDA COASTAL MANAGEMENT PROGRAM: SOCIOLOGICAL RESEARCH OF FLORIDA'S FISHERIES, CM-297

5. Report Date
1/15/92 Date completed

6.

7. Author(s)
William H. Teehan, Michael Jepson, Mary Margaret Overbey

8. Performing Organization Rept. No.
CM - 297

9. Performing Organization Name and Address
Marine Fisheries Commission
2540 Executive Center Circle West
Suite 106
Tallahassee, Florida 32301

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G) NA90AA-H-CZ809

12. Sponsoring Organization Name and Address
U.S. Dept. of Commerce/NOAA
OCRM
1825 Connecticut A., N.W.
Washington D.C. 20235

Dept. of Env. Reg.
Coastal Management
2600 Blair Stone Rd.
Tallahassee, FL 32399

13. Type of Report & Period Covered
Final

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)
The project and final report assist fishery managers in incorporating a social science perspective in fishery management. The report identifies the social science literature relevant to fishery management in Florida. A bibliography of this literature was compiled and includes 2,803 references in a database format for computerized retrieval. A manual on how to use the bibliography and retrieve references by keywords was developed. The keyword index is included as an appendix. The report provides examples of the retrieval capabilities of the bibliography database through the shrimp fishery. The use of social science in fishery management by other states, federal regional councils, and state Sea Grants is presented. And finally, the report proposes some means of incorporating the social science perspective in fishery management.

17. Document Analysis a. Descriptors
social science/fishery management/resource management/bibliography/computer database

b. Identifiers/Open-Ended Terms
Coastal zone management/Florida/Southease/United States

c. COSATI Field/Group social science/anthropology/sociaology

18. Availability Statement
Release unlimited

19. Security Class (This Report)
Unclassified

20. Security Class (This Page)

21. No. of Pages
84 (+150 append

22. Price

(See ANSI-Z39.18) See Instructions on Reverse OPTIONAL FORM 272 (4-77) (Formerly NTIS-35)

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