

Social Considerations Associated With Marine Recreational Fishing Under FCMA

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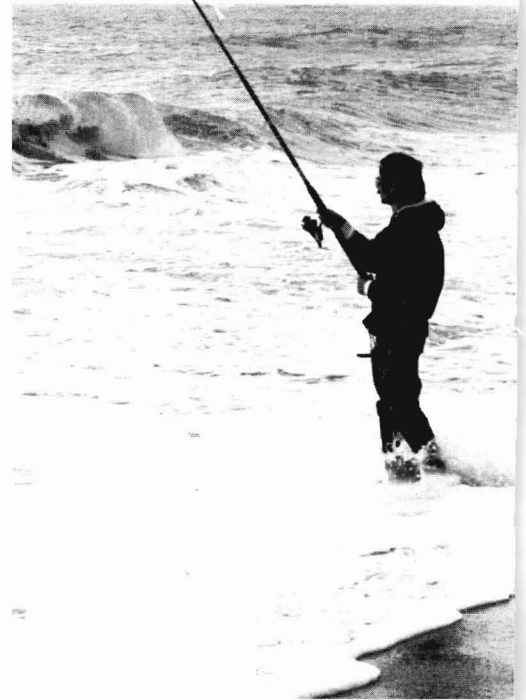
Introduction

Marine fisheries management has, in recent years, focused on the importance of social, economic, and biological factors in planning and management of our marine fisheries resources. Recognition of these three essential components has led to the concept of optimum yield (Roedel, 1975; Nielsen, 1976), which is the dominant management objective in P.L. 94-265, the Fisheries Conservation and Management Act (FCMA) of 1976. The FCMA defines optimum yield (OY) as the maximum sustainable yield, as specifically modified by relevant social, economic, and biological factors.

Under the FCMA guidelines, region-

al councils are required to develop management plans for each identifiable fishery unit; one objective is to apportion OY catches between domestic commercial and recreational fishermen and foreign fleets. Representatives of sport fishing groups and their constituents have expressed increasing concern over what they perceive to be inadequate attention to allocation for the recreational fishery (Clepper, 1978; Stroud, 1978). Decisions on allocation of catch to recreational fishermen are particularly difficult because of insufficient information concerning the impacts of management plans on the economics and sociology of recreational fishing, and the biological impacts of recreational harvests on marine fisheries resources.

The 1979 and 1980 National Statistical Surveys on marine recreational fishing being conducted under contract to the National Marine Fisheries Service will help provide some information such as participation, catch, effort, and on travel origins and destinations. However, comparatively little informa-



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tion is available that permits the incorporation of social considerations in planning for the management of marine recreational fishing; this concern has been expressed by several researchers in recent years (Bryan, 1976; Spaulding, 1976; Ditton, 1977; Speir, 1978; Lackey, 1979) and by a report prepared under contract to the National Marine Fisheries Service¹. Another report recently prepared under contract to the National Marine Fisheries Service² describes

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ABSTRACT—Research in the social and human behavior aspects of marine recreational fishing under the optimum yield objective of the Fisheries Conservation and Management Act of 1976 is reviewed and related to a generalized sequential model of recreation behavior. The outdoor recreational literature reviewed indicates that sociological researchers and managers involved in marine recreational fishing need to consider six general factors: 1) The motivations and expectations of fishermen; 2) the satisfactions and benefits of a fishing

experience to fishermen; 3) typologies of various kinds of fishermen; 4) the preferences of fishermen for various fish species, management goals, and alternative regulations; 5) the social-demographic profiles of fishermen; and 6) the correlations and interrelationships between the variables which measure these study topics. Consideration of these social factors will help marine recreational fisheries managers develop regulations as specific as possible and yet provide for the highest quality fishing experiences for the most fishermen.

¹Centaur Associates. 1979. Phase I report on social and economic information for management of marine recreational fishing: Identification of data needs and priorities for data collection. Report prepared for National Marine Fisheries Service, U.S. Dep. Commer., Wash., D.C., under subcontract with Human Sciences Research, Inc., 81 p.

²Edmonds, W. S. 1979. The development of methodologies to collect socioeconomic information regarding marine recreational fishing. Report prepared by Human Sciences Research, Inc. for National Marine Fisheries Service, Northwest Regional Office, Seattle, Wash., 132 p.

three prototype surveys which have been developed to collect some kinds of social, economic, and demographic data on marine recreational fishing.

This paper reviews some of the available literature on the social and behavioral aspects of marine recreational fishermen and fishing and suggests how this information can fit into a research framework to provide fishery managers with planning information.

Framework for Social Considerations

Research on the social and behavioral aspects of marine recreational fishermen can build upon earlier research on various outdoor recreation activities (e.g., hiking, freshwater fishing) (Bryan, 1976; Ditton, 1977). For example, wildlife managers have been concerned with the regulation and enhancement of wildlife resources for human benefits (Hendee and Schoenfeld, 1973). A review of outdoor recreation literature suggests that a conceptual model must be formulated so that social and behavioral research can proceed to identify and categorize the preferences, satisfactions, motivations, and other characteristics of marine recreational fishermen.

A behavioral model suggested by Driver (1976) defines recreation (e.g., saltwater fishing) as an experience, and

recreation demand as a mix of preferences for an experience that is desired, expected, and in which satisfactions are sought (Fig. 1). Driver assumed that the behavior of each recreationist is not random but results from definite causes (e.g., past experiences, preferences, expectations) even though "1) the recreationist need not be consciously aware of these causes and preferences; 2) the behavior can be spontaneous, exploratory, or trial and error, as well as habitual or engrained in learning from similar past recreation experiences; and 3) the recreationist need not attempt to maximize his expected returns as would the classical economic man." The final social products from a recreational or saltwater fishing experience (Fig. 1) include both satisfactions (e.g., catch, relaxation, exercise) and benefits (e.g., improved health).

A similar conceptual model was proposed by Hendee (1974) as the "multiple-satisfactions approach" to resource management. His basic idea was that "...recreation resources offer people the opportunity for a range of experiences which, in turn, give rise to various human satisfactions. These multiple satisfactions may then lead to benefits—the ultimate goal of recreation-resource management. The nature of recreational experiences, and thus the satisfactions and benefits that fol-

low, can be shaped by management of the surrounding physical, biological and social conditions."

When restating both of these conceptual models in terms of marine recreational fishing, it appears that the most direct products of recreational fisheries management are not only fish (a reasonable probability of catching one or more fish is a definite requirement) but also the fishing experiences which produce human satisfactions and benefits. While this statement is most applicable to recreational anglers it also applies to some extent to commercial fishermen who also value the social satisfactions and benefits which accrue to them during their fishing efforts (e.g., physical exercise, experiencing the ocean environment, pride in their occupation)³.

Satisfactions are the specific and immediately gratifying pleasures from the various aspects of the fishing experience. Net satisfaction from a particular fishing activity is the sum of the satisfying experiences (e.g., relaxation, catch, companionship, enjoying nature, physical exercise) less the dissatisfying experiences (e.g., restrictive

³Peterson, S., and L. Smith. 1979. New England fishing, processing and distribution. Woods Hole Oceanographic Institution, Woods Hole, Mass. Tech. Rep. WHOI-79-52, 73 p.

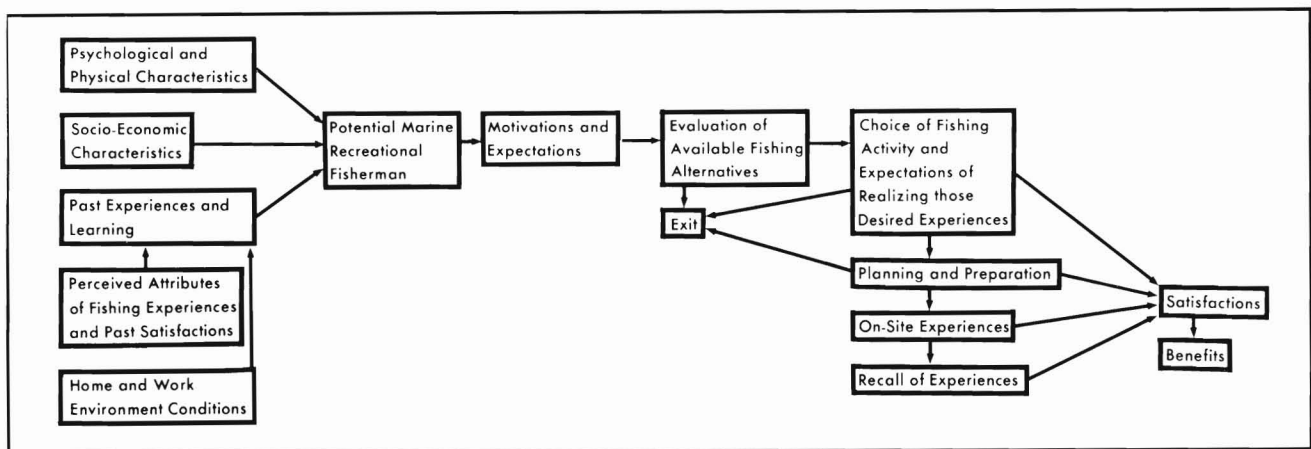


Figure 1. — A generalized sequential model of some social factors and decisions that determine the behavior of a marine recreational fisherman and the outcome of the experiences. (Adapted from Driver, 1976.)

regulations, user conflicts, poor weather, poor catch, equipment problems). Benefits are the general and more enduring conditions resulting from satisfactions. They may be evident in better physical health, improved psychological conditions (e.g., integrative achievements, mental well-being), and better social conditions (e.g., companionship) (Hendee, 1974).

The overall quality of a fishing experience is determined by the extent to which a fisherman experiences the mix of satisfactions which he or she desires. Since the components of desired benefits in a quality fishing experience differ for different individuals, a diversity of opportunities is needed. Thus, fishery managers need to consider such opportunities which provide for the highest quality experiences for the most fishermen (McFadden, 1969; Hendee, 1974; Hampton and Lackey, 1975; Driver, 1976).

Increasingly numerous studies have indicated that multiple factors motivate people to go fishing, although the relative importance of each factor has been open to considerable debate and misunderstanding (Ditton, 1977). For example, two rival hypotheses on the importance of catch to a fishing experience suggest that fishermen are either primarily interested in catching fish or they go fishing to seek satisfactions not directly related to catch. The simple testing of such rival hypotheses against each other will accomplish very little toward the understanding of the complex behavioral phenomena of recreational fishing, since they are dependent on the individual's avidity and experience, socioeconomic background, fish species sought, preferences for a particular type of fishing, fishing site and methods used, and other factors.

To date, most research in the social or behavioral aspects of marine recreational fishing has been conducted without regard for a comprehensive research framework (Ditton, 1977). The available outdoor recreation literature suggests that sociological research in marine recreational fishing needs to consider at least six general study topics: 1) The motivations and expectations of fishermen; 2) the satisfactions

and benefits of a fishing experience to fishermen; 3) typologies of fishermen; 4) the preferences of fishermen for various fish species, management goals, and alternative regulations; 5) the social-demographic characteristics of fishermen; and 6) the correlations and interrelationships between the variables which measure these study topics (Hendee, 1974; Bryan, 1976; Driver, 1976; Ditton, 1977).

Review of Social Research

Motivations and expectations for marine recreational fishing experiences are the general and trip-specific incentives which activate an individual to participate in some form of marine recreational fishing (Fig. 1). The experiences of that activity lead to satisfactions and eventually benefits. Since motivations lead directly to satisfactions, and past satisfactions often form the basis for present or future motivations, researchers have tended to define and aggregate motivations and satisfactions into similar categories. Hendee and Bryan (1978) have identified 16 general categories that encompass virtually all of the motivations and satisfactions reported in 56 studies of outdoor recreation activities, especially studies of hunting and fishing (Table 1).

Motivational research to date has generally described the motives of freshwater fishermen but only a few studies have been directed toward marine anglers. Research on freshwater fishermen can offer some general guidelines toward investigating the motivations of saltwater fishermen.

However, specific findings probably should not be generalized between freshwater and saltwater angling since these recreational experiences take place in different environmental settings. The experiences of a trout fisherman on a western mountain stream are inherently different from those of a bluefish angler on a charter boat off the Atlantic coast or a saltwater flyrod angler fishing tidal waters. The total mix of motivations and expectations (Table 1) for each of these activities will be different for each fisherman.

Sociological studies of freshwater fishermen indicate that motives for fishing are multiple, and that experiencing the natural environment, relaxation, and companionship were often rated by anglers as more important components of a fishing trip than were factors of catch (Moeller and Engelken, 1972; Knopf et al., 1973; Hampton and Lackey, 1975; Cox, 1977). However, Weithman and Anderson (1978) pointed out that the species, number, and size of the catch may "... make the difference between good or excellent fishing and an extremely enjoyable fishing trip, as opposed to fair or poor fishing and a moderately enjoyable fishing trip."

Research by Bryan (1974) and Spaulding (1970) indicated that marine recreational fishermen place high levels of importance on relaxation, experiencing the outdoor environment, and catching fish. Recreational fishermen entering a fishing contest in Victoria, B.C., and anglers using charter and party boats in New York reportedly placed a higher level of importance on catch than on other factors (Sewell and Rostron, 1970; Carls, 1976). However, a study of Texas charter boat fishermen reported that having fun, adventure, escapism, and companionship were more important motives for charter boat fishing than catching fish (Ditton et al., 1978). Fraser et al. (1977) suggested that charter boat fishermen are less catch oriented than party-boat fishermen.

While more studies of marine anglers are needed, the few preliminary studies available point out that motivations for marine recreational fishing are multiple

Table 1.—General categories of motivations and satisfactions from outdoor recreation activities as reported by Hendee and Bryan (1978).

Motivations and satisfactions	
1. Nature appreciation	9. Environmental education
2. Escapism	10. Spiritual rejuvenation
3. Companionship	11. Experience a simpler life style
4. Social interaction	12. Experience heritage
5. Activity skills	13. Challenge
6. Display of accomplishments	14. Exercise
7. Enjoyment of equipment	15. Relaxation and general enjoyment
8. Consumptive use of natural resources	16. Vicarious experience and enjoyment

and that the relative importance of each motive varies with different types of fishermen. Catching some fish is an important motivation for marine recreational fishing but, as Ditton et al. (1978) suggest, catching fish does not necessarily mean a large number of fish since qualitative aspects of catch may be considered more important than quantitative aspects of catch.

Knowledge of the various expectations and motives for each type of fishing can provide some guidelines for fishery managers. For example, marine anglers may not be adversely affected by bag limit regulations, which, when used under appropriate conditions, can distribute the catch among more fishermen, as long as they still have a relatively high probability of catching one or more fish. Information on the expectations and motives of anglers can also help managers determine management alternatives which will help: 1) Meet expectations (e.g., by managing a fishery to produce a certain number or size of fish), 2) redirect expectations (e.g., through the dissemination of information on different and/or "under-utilized" species that could provide an experience similar to the species originally sought), or 3) change expectations (e.g., through information and education programs on the need for catch allocations under OY).

Future research studies will need to develop direct and conclusive studies on motivations and expectations. These should better identify the various motives and their relative importance, and also begin to answer some of the questions about the formation of motives and the process of motivation change that leads a fisherman to seek different species, settings, equipment, and experiences.

Current measures of satisfaction for marine recreational fishing and the conceptual theories about satisfaction have not been completely developed yet or are only exploratory in nature (Ditton, 1977; Centaur Associates, Footnote 1). Further research is needed to develop adequate survey instruments which will obtain this type of social information. Additionally, some confusion has resulted from the use of

motivations and satisfactions as synonymous terms. Past satisfactions contribute the motivation for immediate or future decisions to engage in an activity and both have been discussed in similar terms (Table 1), although they are the same in kind they are not the same in time (Fig. 1) and must be measured accordingly. Additionally, it should be noted that net or total satisfaction from a fishing experience includes both 1) the sum of the satisfying experiences less the dissatisfying experiences and 2) the disparity or congruence between the motives for fishing and the angler's perceived satisfactions. This type of research, which has been conducted with some wilderness users (Peterson, 1974; Snowden⁴) and river floaters (Graefe⁵), could be applied to marine recreational fishing to help identify possible ways of managing the fishing experiences to increase total satisfaction, and also to minimize the negative impacts that potential management plans or regulations would have on satisfactions and benefits. Benefits may be thought of here in terms of improved physical, psychological, or personal conditions for the fishermen. Hendee and Bryan (1978) noted that studies about benefits and the relationship of satisfactions to benefits are rare and that further research needs to be conducted.

Research identifying and separating various user groups or subgroups within hunters (Potter et al., 1973) and wilderness users (Hendee et al., 1968; Stankey, 1973) has been carried out, but similar work identifying different types of marine recreational fishermen has not been reported in the literature. The studies on hunters and hikers identified homogeneous subgroups or types who share some combination of similar motives, preferences, satisfactions or

⁴Snowden, M. R. 1976. Winter recreation in the Adirondack high peaks wilderness: User characteristics, attitudes and perceptions. M.S. Thesis, Dep. Natural Resources, Cornell University, Ithaca, N.Y., 103 p.

⁵Graefe, A. R. 1977. Elements of motivation and satisfaction in the float trip experience in Big Bend National Park. Masters Thesis, Dep. Recreation Parks, Texas A&M Univ., College Station, 170 p.

other factors important to their recreational experience. Similar research has been conducted by Kellert⁶ on American attitudes, knowledge, and behavior toward wildlife and natural habitats. Ditton (1977) stated that management plans which consider the social needs and attitudes of the various subgroups of marine recreational fishermen will create greater satisfaction than plans that consider only the "average" fishermen.

Bryan (1976, 1979) concluded that there are four basic types of freshwater fishermen: 1) The "occasional" fisherman with novice ability and only casual interest in the sport; 2) the "generalist" fisherman who is interested in catching some fish in any environment by any legal method; 3) the "tackle-species specialist" who specializes in the skill of a particular angling method and/or angling for a particular species; and 4) the "method-species-setting specialist" who specializes in the method, species, and setting which make up a particular experience. These fishermen types are based on their degree of specialization in fishing and their specific motives and expectations involved in using the resource. Hendee and Bryan (1978) further postulated that fishermen advance into more specialized stages as they accumulate more experience. As a result they will seek different satisfactions from the same fishing activities over a period of development. Additionally, a fisherman may change from one user subgroup to another when he changes fishing activities because he may have different motivations for engaging in each variety of recreational fishing activity (Driver and Knopf, 1976). For example, an individual fishing for billfish on one trip and flounder on the next trip, will have different reasons for both angling experiences.

Manfredo et al. (1978) developed a typology of freshwater fishermen based on the different reactions of anglers to

⁶Kellert, S. R. 1979. Public attitudes toward critical wildlife and natural habitat issues. Phase I report prepared for U.S. Dep. Inter. Fish. and Wildlife Service, Washington, D.C., 138 p.

fishing in a wilderness area. Their study was based on a multivariable cluster analysis of the various social attributes of the anglers and factors related directly to the fishing experience. Marine fishery managers could use this type of analysis to compare the degree of specialization, preferences, satisfactions, attitudes, or demographic characteristics (e.g., level of income, social groups, age) of various subgroups of marine fishermen and try to manage for the maximum positive mix of experiences desired by each group identified.

The preferences of recreational fishermen for various fish species, angling strategies, and management goals, strategies, or regulations need to be studied so that management plans actually respond to the wishes and preferences of the fishermen and not the values of the fishery managers (Stankey, 1977). For example, Hampton and Lackey (1975) reported a basic discrepancy between anglers' desires and managers' objectives or goals in some freshwater fishery management situations. Although these types of studies have been proposed for marine recreational fishing research, they have apparently not yet been carried out (Hester and Sorensen, 1978; Dawson⁷).

Social, economic, and demographic profiles of marine recreational fishermen need to be formulated, in addition to the collection of participation data relating to catch and effort. Such descriptive studies have been carried out in different areas and among various subgroups of marine fishermen (e.g., Sewell and Rostron, 1970; Cox, 1977; Ditton et al., 1978). Comparison of these data among various user groups, between different geographic areas and repeated periodically, will help to define the various fishermen constituencies and their characteristics.

Finally, studies are needed to examine the correlations and interrelationships between the five study topics

⁷Dawson, C. P. 1979. Background information and management strategies for the development of recreational fisheries management plans in the Northeast Atlantic Fisheries Conservation Zone. M.P.S. Project Report, Dep. Natural Resources, Cornell University, Ithaca, N.Y., 70 p.

discussed above: Motivations and expectations of marine anglers; their satisfactions and benefits from fishing; the various types of fishermen; their preferences for various fish species, management goals, and alternative regulations; and the social-demographic characteristics of marine anglers. This type of research may find that older fishermen primarily seek companionship whereas younger fishermen seek achievement. Multivariate analysis could help identify these relationships, as well as some measure of resource specificity for various subgroups of fishermen, resolution of current and potential fishing conflicts, acceptable substitutes for preferred fishing activities or fish species, and management regulations that would be most acceptable to each marine recreational fishing subgroup. Such information could be used to test management strategies, such as one suggested by Bryan (1976) in which the overall user welfare could be optimized by resolving conflicts in favor of those fishermen with more specific resource and motivational needs, since fishermen with more general resource and motivational needs would presumably have more alternate fishing opportunities.

Conclusion

This review of social considerations in marine recreational fishing is not meant to be an exhaustive research document but rather an introduction and discussion so that both researchers and managers can begin to identify the needs for and begin the development of a conceptual framework that will improve optimum management plans for marine recreational fisheries. Additionally, we have tried to point out why certain research topics are important to both researchers and managers. For example, conflicts which have developed between various groups of fishermen can be partially understood through consideration of their motivations, expectations, and satisfactions. Tournament and fishing contest participants may be in conflict with other marine recreational fishermen since their interest in catch may promote a sense of competition which runs against

the motivations of other fishermen—relaxation, companionship, experiencing the environment, and a change from the everyday work world. Conflicts such as these may be minimized by regulations on the promotion of contests and by having contests reaffirm the contemplative aspects of recreational fishing (Stroud, 1975).

Summary

The measurement of social considerations in OY management under the FCMA will require social and behavioral research that considers at least six basic topics in marine recreational fishing: 1) Motivations or expectations of fishermen, 2) satisfactions and benefits from fishing, 3) typologies of fishermen, 4) preferences for fish species, management goals, and alternative management regulations, 5) social and demographic characteristics of fishermen, and 6) correlations and interrelationships between the variables of these topics. Consideration of these social factors will help marine recreational fishery managers develop regulations as specific as possible and also provide a diversity of opportunities which offers the highest quality marine angling experiences for the most fishermen.

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