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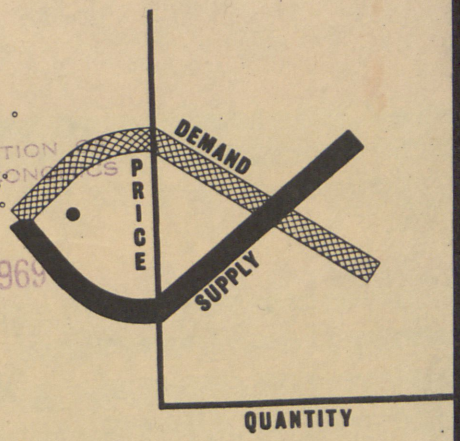

SOME ELEMENTS OF AN EVALUATION OF THE EFFECTS OF LEGAL FACTORS ON THE UTILIZATION OF FISHERY RESOURCES

by

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Some Elements of an Evaluation of the Effects of Legal Factors on the Utilization of Fishery Resources

by

Adam A. Sokoloski

"The capacity of scientific progress to create new problems for society, it appears, has outrun the capacity of social progress to solve them. . . . . There is . . . . a question of whether requisite changes in our mechanism of choice will keep pace with the dynamic development of the scope of choice." (1, p.262)

What is the mechanism of choice in the management of the individual U. S. fisheries? Has this mechanism kept pace with the scope of choice which is now available to the fisheries industry? Before I attempt to discuss the first question I will answer the second with a resounding NO! I hasten to add that I am talking primarily of the harvesting (hunting?) process.

CHOICE

The present management of U. S. fisheries is a complex function of historical patterns. Included in these patterns are alternating periods during which the marine fishery resources were regarded as either the specific domain of riparian nations (in a broad sense) or as the common property of all nations having access to the sea. Also prevailing was an evolution from a belief that these resources were inexhaustible to an appreciation that natural limits do exist and therefore that some form of management should be contemplated. Inevitably the dominant issues associated with jurisdictional considerations have become intermingled with issues

SCARCITY

*Division of Economic Research, Bureau of Commercial Fisheries

which are presented as purely of relevance to the scientific management of the resource. Economic considerations were also present, however implicitly rather than explicitly stated, and however imperfectly understood even to this day.

From this maze I shall extract and identify some crucial pervading legal-administrative elements of the present U. S. harvesting pattern. Ultimately I will suggest issues that merit particular emphasis and indicate those that are now receiving this emphasis, whether it be by policy-makers in general, or society in particular.

The Evolution of "Rights" to Marine Fishery Resources

There is the very strong inclination to view the world's oceans as vast water bodies traditionally available to all. As such, current expanded claims by some coastal nations are viewed contrary to tradition, with the allowance of a narrow coastal band being more acceptable.

From unilateral appropriation. A fact worth recalling is that there was a time several centuries ago when common rights to the ocean were even more uncertain. As late as the 16th century, a preponderance of legal opinion looked favorably on unilateral appropriation of the high seas, i.e., the right of one nation or a group of nations to virtually

COMMONALITY

exclusive use of certain seas.[1] Examples include the attempts of Norway and Denmark to maintain sovereignty over the North Atlantic between Iceland and Norway. Even more basic were the classic disputes between England and Spain to "rule the sea" and between Spain and Portugal over exclusive trade and navigation rights in most of the Atlantic and Pacific Ocean.

These actions sufficiently establish a historical precedent which is quite the opposite to the present pattern of virtually unrestricted usage of the open seas. This pattern has existed since England broke the control of Spain, Portugal and Denmark in the early 17th century.

In the interim, however, there was considerable vacillation concerning the degree to which the seas were freely open. The prime point of conflict concerned the degree to which special rights belonged to coastal states. Although historical records remain unclear, there is considerable reference to the need for coastal jurisdiction within some maximum common range.

Also relevant were continued Scandanavian claims to the high seas. Under pressure, these countries began a retreat to various zones ranging from one to ten leagues,[2] most of these zones being related to fishing rights of one form or another. Although these zones were initially claimed only as neutral buffer zones, they eventually were claimed under the aegis of full sovereignty, the beginning of the present tradition of territorial waters. Territorial claims expanded conceptually until they were understood

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1/ Many of these references to early dominance of certain oceans may be found in Heinzen (5).

2/ One league is an imprecise measure equal to approximately three miles, though it equalled four miles in Scandanavian practice at that time.

to be equivalent to an extension of a country's coastal boundary to a locus of points three miles at sea.

There is little merit in further delineating the development of the concept of territorial waters. Suffice to say, there is sufficient historical evidence to dispel the belief that the use of the oceans has been evolving in a simple linear fashion from complete freedom to one of gradual restriction in territorial and contiguous waters.

A further complication in an evaluation of trends in the use of the oceans' fisheries resources involves changes in use concepts for the high seas after the initial establishment of territorial zones.

Westphalian decentralization. The dominant legal form of ocean management for much of the past two centuries has been derived from the Peace of Westphalia (1648). Under this agreement the oceans were left virtually free with only a decentralized, voluntary atmosphere with respect to management of the resources (4). With respect to fisheries this system was adequate, as technology limited activity to territorial or adjacent waters. The comprehensive nature of the late 19th century industrial revolution included fisheries in its grasp. However, questions arose concerning the appropriateness of the Westphalian system. This improving technology led to further geographic pressure on fisheries resources, and some existing fisheries became threatened with depletion. Coupled with the growing awareness of income and food source possibilities this

COMPARATIVE ADVANTAGE . .

technical advance has spurred the entrance of many new, smaller countries to enter the fishery. It was rapidly becoming apparent to some that this "free, inexhaustible resource" was approaching a stage where regulation might be desirable.

The beginning of a reform period was marked by the identification of the need to resolve issues related to (a) some limitation on the expansion of claims to coastal waters, and (b) the need for some regulation on the high seas, whether due to economic or conservation motives.[3/] These problems were emphasized due to the apparent reluctance of present world powers to exert the degree of influence exercised by the 17th century powers such as England, France and Spain (3, p.5). These facts suggest that international negotiation will be necessary in order to recognize the fact that different nations unavoidably have different needs and therefore different claims to the ocean. As a reflection of this latter point some consideration must be given to correlation between the geographic DIFFERENCES OVER TIME distribution of technology, resource supplies, and human need; all with respect to the past, the present and the future activities of each nation of the world.

First Geneva Convention. The first formal step of significance was the 1958 Convention on Fishing and Conservation of the Living Resources of the High Seas, the document resulting from a Geneva conference of

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3/ Which cannot be totally separated, especially in the long run.

world powers. This convention embodies a demand for a functional reorientation of Westphalia and provides a general mechanism for third party settlement of disputes. However, this convention has never been ratified by a significant number of world powers, especially those with distant water fleets and with an interest in expanding up to and perhaps within the coastal waters of other nations. Nevertheless, this initial conference did signal the beginning of a shift in interest from purely jurisdictional issues to a mixture of jurisdictional, conservation, and economic consideration.[4/]

Aside from these general results, the conference gave some special status to coastal states and contiguous waters. Also, it signalled the beginning of negotiated settlements, such as those prevalent in the halibut, salmon and tuna fisheries. These agreements are still highly experimental, as they have yet to truly face the problems of shifting resources and new nations entering the fishery, especially as these new nations will not initially be a party to existing agreements.

CHANGE

The Role of the States

The evolution of the states' role in fisheries management is similar to the national interaction described. Quite obviously this

4/ Here again, the unstated assumption that somehow these can be separated.

role is derived in part from that point in time when the world's commercial fishing activities were totally coastal. Presently, however, it would be a worthwhile exercise to examine the present reasons for a state's participation in resource management.

The first reason is the obvious presence of a resource unique to the coastal waters of a state, or at least a group of states, either on our ocean or gulf shores, or our lakes and commercial ponds. Examples which come to mind are lobsters (Maine), Atlantic menhaden (Maryland, Virginia, etc.), blue crab (Maryland, Virginia, etc.), pompano (Florida), anchovy (California) and king crab (Alaska). Under a long-standing policy the management of these resources has been left to the states involved, although there is currently discussion in some circles concerning the advisability of Federal participation in the management of certain of these coastal fisheries to alleviate growing institutional (legal) problems. In a few minutes I will summarize the motives behind this thinking more directly.

SEPARATE RESOURCE

A second reason for state participation is closer identification with the indigenous commercial activity associated with the fisheries. In an area like Southern New England, where 11.1 percent of the personal income of the region is associated with its proximity to marine resources (8), it is quite logical that businessmen, public officials and citizens alike should be interested in acting in response

ASSOCIATED ECONOMIC ACTIVITY

to problems affecting them. Because this response is public and represents diverse interests, it generates diverse management procedures and guidelines, many of which are contradictory as well as not responsive to the increasing "dynamic development of the scope of choice."

A third reason for state involvement is the presence of the growing conflict between localized commercial fisheries and recreational use of marine resources. This adds a new element. Whereas other factors revolve around the management of a given activity, we have here the issue of a choice between two alternative uses of the resource, the assumption being that at certain levels these two uses cannot feasibly exist simultaneously. In some cases the resulting regulatory process may involve two or more stages within a region, in addition to the multiplicity of agencies involved within each state -- and this is only for one of many alternative uses which exist (oil, minerals, effluent dilution, transportation, etc.).

CHOICE

A fourth reason for state participation in fisheries management is a continuation of the first point and is especially relevant with respect to the world-wide expansion of some of our domestic fisheries. In particular this is a historical function of that time when all fisheries were coastal, and therefore coastal (or state) regulation of fisheries involved all fishing activities. As some of the fishermen in varying states have moved to international fishing areas around the world there

is some inclination for certain state regulatory bodies to retain partial control over these activities, despite the relevance of three-mile limits. Though states cannot patrol international waters to enforce regulation, some states regulate high seas activity by virtue of such indirect measures as regulation of the type of gear used on vessels registered within a state, and control over the species which are landed in that state.[5/]

The complex of regulatory activities resulting from these four sources of state activity are well known to all of us. As I have noted previously, the height of these activities is reached when two or more states interact. This may occur in several ways, among them being the existence of a common commercial fishery with differing regulations (Maryland-Virginia crab), a common sports fishery with different regulations (Oregon-Washington, Columbia River), a common oil or mineral resource with different regulations, or any of the many permutations and combinations of these and other factors.

As has been suggested by both textual and marginal comments, many basic economic concepts are either implicitly or explicitly present in the above comments summarizing the past and present nature of public participation in resource management. What follows will be a further exposition on these economic elements and the manner in which they <u>could</u> affect the future of the U. S. fishery by virtue of their unavoidable presence and their incorporation into the design and operation of management entities.

5/ I have introduced this point only to indicate that state activity is not limited totally to coastal waters. I do not suggest that this influence of individual states on high seas activity is great at this time.

Inherent Economic Elements of Fishery Management

Economics is the science of allocating scarce resources among alternative production processes as dictated by the quantification of expressed needs. A crucial starting point is the reference to scarcity. If a resource is so plentiful as to command no or little price on the open market, economics will not be involved. Certainly many coastal fisheries originally approximated this condition. Plentiful resources required only the efforts of the simplest forms of capture. In some countries, such as the U. S., food from the land was so readily available that fisheries products were largely ignored.[6/]

When, however, through the increase in expressed needs (demand) and through growing harvest capability, the pressures described previously were exerted on existing resources, decisions had to be made among alternative courses. Many of these face us today, such as the degree of conservation needed, who to allocate resources to, and over what period of time. Economic values, in terms of the primary and occasionally the secondary costs and benefits, can be attached to these alternatives, with the possible exception of such public goods as conservation and recreation, where the theory and practice of economic evaluation is still very much in the adolescent stages. Allocation of resources to these uses remains essentially a political process, with the proviso that economic analysis can increasingly provide supplementary information to assist in this decision making areas.

6/ This is despite all romantic tales which incorrectly give the fisheries an important role in our economic history.

But what of the U. S. Commercial Fisheries? If I may put aside recreation issues for the moment, I believe we can conclude that conservation becomes relevant only when a species is threatened with extinction. I am sure most of you here, from all your scientific and commercial fields of specialization, will agree that there are few cases where a commercial fishery can possibly continue to a point of extinction (without subsidy)[7/] and still be a profitable enterprise. Indeed, much of our present research is oriented toward the goal of maximum sustainable yield, not questions of preservation. We are therefore concerned with those elements of population dynamics which are associated directly or indirectly with the profitable undertaking of commercial activities to meet man's needs for fishery products.

Property Rights. In an unrestricted environment the economist, the biologist, and the technologist could work togehter to develop the systematic steps to be taken to achieve these goals, each supplying their expertise to the choices between alternatives over time. But the prime reason for this presentation is that the environment is not unrestricted. Having described this restriction somewhat, and the ways in which economics might participate in an unrestricted environment, the remaining tasks in this paper are to indicate the reasons for the restriction and the ways in which economic and institutional elements may be integrated.

7/ Which suggests conflicting policy, i.e., concern about declining population levels, and subsidies to provide even greater aggregate harvesting capabilities.

As you are all aware there are many instances in which a decentralized, unregulated economic system has done an acceptable job of generating supplies to meet demands. One permissive factor in these situations is the ability of resource users to obtain explicit rights to the use of certain quantitites of a resource, these rights taking the form of ownership rights.

Within a framework of ownership rights it becomes possible for resource users to (1) quantify the resource in terms of specific units to which they have sole access, (2) invest (capital) in the resource with the assurance that this investment will not be lost due to loss or ownership or encroachment by other resource users, (3) buy and sell the units of resources owned in response to changes in demand for fish food, recreation, minerals, etc. and (4) obtain some measure of the interrelationships between resource users (owners) and therefore facilitate either coordination in those cases of joint advantage or compensation for detrimental activities by one resource user upon another.

As an element of technological change, and also as part of man's changing needs and desires, it must be possible to shift resources to their most efficient combinations in response to the changing environment. The individual fisherman who senses this change may wish to change his harvesting pattern. But, if he cannot be guaranteed a specific quantity of resource upon which to base his harvesting activities, he

will be reluctant to make new capital investments and he will be reluctant to endure the short run financial stress associated with the learning process which is inevitable when changing fisheries, vessels, geographic locations or major gear packages. Because of this reluctance he will either continue in his present pattern, which may be less than optimal in a national sense, or he may make a token change. In either case there will be a tendency to extend the use of inefficient vessels and gear and a tendency to exert excess effort on the historical fisheries.

This description is not a revelation to most members of the American Fisheries Society, I am sure, but I hope the focus on the absence of property rights will redirect current discussions on the causes of some of the problems in the harvesting sector of the American fishing industry.

Regulatory Measures. Considerable recognition of this cause already exists, however, in the form of the many laws and codes which have been written to attempt to alleviate either the basic cause (the absence of property rights) or the sundry attendant problems associated with effort misallocation. An economist therefore has the task of measuring two closely related costs, the costs associated with misallocation due to the absence of property rights and their role in resource allocation, and the costs associated

with the laws, codes, rules and regulations supposedly initiated to alleviate problems resulting from this absence.[8/]

Neither of these has received significant emphasis to this date. However, the U. S. Bureau of Commercial Fisheries has recently designated the general area of institutional[9/] elements of the U. S. fishery as deserving of top priority. In a sense this paper represents a first exploratory discussion of the basic elements of this problem as related to the harvesting sector.

Some examples of the types of analyses which are being contemplated would be in order. Consider first the Pacific Northwest Salmon Fishery. In a completely free enterprise atmosphere harvesting would gravitate toward the most efficient systems, hypothesized to be either an upstream trapping system or a downstream purse seine operation. A trapping system, such as the one described in Richards (7, pp.115-121), could be designed to include selection and sorting facilities prior to capture. This would permit virtually individual selection of a fish based on its marketability. Numbers necessary for propagation could be released and

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8/ Those regulation which are effective generate benefits which counterbalance these latter costs.

9/ This term generally includes all of society's superimposed structures which modify natural laws and theories. These range from individual habits to constitutional laws and international treaties.

all incidental fish would pass unharmed. The facility would also have considerable potential for research and management. Costs of harvesting could be reduced by twentyfold. This type of system, especially due to the homing traits of salmon, would reduce salmon to a stream management problem for each state.

This is the simplistic viewpoint. It assumes we can turn back the clock to a period prior to all present harvesting patterns. Its value, therefore, is limited to the dramatic affect of the contrast generated and the incentive it provides for an economic evaluation of the costs (sacrificed catch levels) and benefits (?) associated with different present levels of regulation. I do not necessarily suggest that the comparative magnitude of these costs be the sole determinant of whether new regulations be enacted or old regulations be set aside. This decision will involve a complex of socio-economic and political forces. I merely suggest that a measure of significant economic losses resulting from a given regulation will alter the decision path in some instances. More significant, perhaps, is the possibility that the aggregate affect of the regulatory and administrative structure may be a major cause of the overall malaise of the U. S. Commericial Fishery.

This supposition is supported by a look at each individual fishery. Selected examples indicate the dominant role of regulations which preclude

harvest techniques which are suspected to be more economically efficient. Among these are the Florida Shrimp fishery.[10/] Does anyone know the economic costs of such passages as:

> "It shall be unlawful to catch or attempt to catch shrimp or prawn in the territorial waters of the state in any county whose coastal boundary borders solely on the Atlantic Ocean, by use of trawl nets during night hours except during the months of June, July, and August." (p.33)

and also:

> "It shall be unlawful for any person, firm or corporation to take shrimp from the waters of Escambia and Santa Rosa Counties with a net or trawl that exceeds forty-five (45') feet on cork line length, or two nets exceeding (22½') -- per boat. The leg lines of a forty-five foot (45') net, --, shall not exceed eight (8') on both the cork and lead lines". (p.85)

and more dramatically:

> "The use of airboats by any person, firm or corporation in the taking or trawling for shrimp in the waters of Lee County, Florida, is hereby prohibited". (pp.85-86)

Thses are only a few examples from one state. We could continue to enumerate almost indefinitely if we proceeded from state to state.

Louisiana recently considered a law to prohibit crab pots, Maryland still requires a remnant of a skipjack fishery and Oregon, Washington, and Alaska each have a different set of guides for their Salmon fishermen. Regulatory factors have played a major role in delaying the development of a thread herring fishery off the coast of Georgia and Florida and they have also been prominent for California Anchovy.

10/ A collection of laws by the Florida Board of Conservation, Salt Water Division, is almost 300 pages long, with major portions concerning shrimp regulations by estuary, county, area and state, and by species, time of year, etc. (4). The choice of Florida is merely a random selection. Additional comments may be found in Chapman (2).

Certainly for each of these instances there are justifiable motives. For many it may also be the most economically efficient way of incorporating unavoidable restrictions. However, with the ever-increasing economic pressure on the commercial element of this U. S. industry, the sciences of commerce must be brought to bear on all elements of this industry, and the regulatory activity plays a dominant role here.

Design of an Administrative Agency

The inclusion of economic costs and benefits in the process of either ex post or ex ante evaluation of a given regulation or a group of regulations implicitly invokes concepts of the design of regulatory agencies to perform both new and old tasks. Though I will not dwell on this point, a summary of some basic quidelines seems appropriate.

The Agency's Tasks. This administrative unit must have the ability to cope with the interacting variables included throughout this paper.[11/] Once again, these are: the necessity of making a choice between alternatives, the ability to change in response to different needs over time, the need to evaluate losses associated with different resource use patterns, and to be aware of any comparative advantage on the one hand and both associated and competitive economic uses for these resources on the other hand. In all cases the risks associated with the trade-off between flexibility and uncertainty in the management of a common property resource (e.g., no individual property rights) must be included in the management process.

11/ Additional criteria and a more complete discussion and reference may be found in Sokoloski (9).

This suggests an agency which has a dynamic management function, with the comprehensive talents and abilities to adjust over time. Of necessity this agency must be part of the political process, to make it responsive to social values not yet subject to scientific quantification. Rather than being subject to every political whim, however, it should be aggressive in supplying scientific information to the political process.

As implied earlier, there is an increasing tendency in some quarters to view this ideal agency as an arm of the Federal Government. Motivation is provided by the obvious difficulties encountered by State agencies undertaking separate management paths for regional fisheries (witness current debate over the management of the Chesapeake Bay Blue Crab resource). A logical alternative, however, is regional compacts or commissions. These have met with some success in other areas of water resource management. Though a lengthy discussion would be out of place in this presentation, this topic should merit further consideration in future discussions among regional marine resource managers.

One issue must be faced, however, as it persists at local, state and Federal levels. This is the question of the goal of fisheries resource management. Presently this goal appears to be a mixture of the desire to maximize the number of people in each fishery and the desire to harvest our <u>needed</u> fisheries products in the most economically efficient way possible. Indeed, achieving the latter goal may

lead to an overall expansion sufficient to partially satisfy the former goal, provided that this expansion is sufficient to offset the decreasing need for labor inputs per unit harvested.

In the short run this is not likely, however, and therefore programs designed to perpetuate past and present technology and associated labor-capital combinations despite both external (via imports) and internal pressures to undergo vast correction must be recognized as a form of welfare program.[12/]

I will agree that these programs are needed. However, they must be truthfully recognized as interim measures to ease the pain of adjustment. They must not be confused with long term programs designed to improve the competitive position of the U. S. fishery. This clear distinction would hopefully be an asset in the art of lawmaking. It would decrease the tendency to legislate against innovation under the banner of improving the lot of the fisherman.

This is especially true in light of recent observations made by Professor Lampe (6). His research and forceful analysis suggest new emphasis on the dynamics of interacting fisheries in the management of the U. S. Commercial Fishery. He suggests that we carefully examine the Soviet and Japanese strategy which has "shown us in fact that the successful exploitation of the sea does not depend upon the sustained yield of a single fishery" (6,p.1), and further, "the interaction among

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12/ This designation may be used for governmental financial support for outmoded and unneeded activities, under the guise of individual betterment.

fisheries may well yield benefit to society in very nearly an optimum way even when they are not regulated" (6,p.2). The activities of Rhode Island fishermen operating out of Point Judith are cited as a micro-example of the Soviet technique. They follow a continuing practice of rotating from one local species to another, depending on market prices and harvesting favorability.

This flexibility has led to considerable success for this fleet and community as compared to those communities which must suffer through the periodic declines associated with many fisheries.

In light of these observations, maxims associated with the isolated management of individual fisheries, each toward a goal of maximum sustainable yield, must be completely reexamined.

The need for careful legislating is especially crucial if one can picture the entire context of this paper, which hopefully has given some feeling for the historical accumulation of a heterogenous agglomeration of legislative acts -- and the difficulties of taking any bold new steps in the face of the inevitable paralysis which we now are experiencing. It becomes imperative that we legislate wisely, separating the short term adjustment measures from positive long term activities. There is an unavoidable tendency for short term legislation to become a permanent part of the administrative framework. As these measures are primarily protective and compensatory, any hopes for more progressive, comprehensive actions are considerably lessened.

Conclusions

There is a tendency among economists, perhaps among all scientists, to examine theoretical issues and conduct empirical research in a vacuum, isolated from the exigencies of social and political reality. What I have been discussing here has been the opposite. Hopefully, I have pictured the historical development of a fisheries management structure which includes the many social, economic and political elements of fisheries.

The economist should not pretend expertise in social and political arenas, however. He is trained to examine the process of allocating resources into production designed to satisfy man's varied needs. This involves measuring the demand for fishery products and a specification of the costs of the various inputs into the production process, these costs to be used to determine the "ideal" combination of inputs to meet a specific demand. To the degree that some element of this ideal input combination is not permitted by law, the economist may then proceed to estimate the sacrifice incurred by deviating from this ideal to the best input combination permitted by law.

A realization of this sacrifice may be sufficient incentive for a change in the laws involved. Further, as demand changes and harvesting technology changes there may be continued incentive to change. With the absence of property rights this activity will be largely

under the purview of a public regulatory body. This unit must therefore have the facility to respond to the combined changes in the scientific, economic, political and social manifestation of society. In the process of responding, however, these agencies must clearly have in mind the distinction between short term welfare policies designed to ease transition, and the long run goals of improving the competitive position of the U. S. Commercial Fishery, increasing the returns to U. S. fishermen, and providing a product of improved quality at a competitive price.

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(continued from inside front cover)

14. A Price Incentive Plan for Distressed Fisheries by A. A. Sokoloski and E. W. Christenson.

15. Demand and Prices for Shrimp by D. Cleary.

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The goal of the Division of Economic Research is to engage in economic studies which will provide industry and government with costs, production and earnings analyses; furnish projections and forecasts of food fish and industrial fish needs for the U. S.; develop an overall plan to develop each U. S. fishery to its maximum economic potential and serve as an advisory service in evaluating alternative programs within the Bureau of Commercial Fisheries.

In the process of working towards these goals an array of written materials have been generated representing items ranging from iterim discussion papers to contract reports. These items are available to interested professionals in limited quantities of offset reproduction. These "Working Papers" are not to be construed as official BCF publications and the analytical techniques used and conclusions reached in no way represent a final policy determination endorsed by the U. S. Bureau of Commercial Fisheries.