

THE COSTS OF UNCONTROLLED ACCESS IN FISHERIES

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It is our purpose here only to point out that the existence of unnecessary and hampering legislation, whatever its origin or motive, is, to the extent to which it is enforced, an economic factor which must be taken seriously into account . . . However, human nature being what it is, rational and scientific legislation is hardly to be expected in a resource which is not subject to private ownership.

Harden F. Taylor

Introduction

If there is no control over access (1) in fisheries and if demand for a stock (or stocks) of fish is increasing, then:

1. Overcapitalization (2) is inevitable and will become worse as prices for the product increase.
2. Measures to prevent depletion (3) will either impose or lead to increased costs of fishing to the fishermen, and these costs will become greater as prices for the product increase.
3. The costs of management, research, and enforcement will be borne entirely by the taxpayer.

This statement is designed to provide a partial basis for dealing with the question of whether some form of control over access should be adopted. The statement is not intended to make any judgment on the desirability of avoiding the consequences that are described. Instead, it simply points out that the described consequences are inevitable if there is no control over access.

It does not follow from the statement that the described consequences will necessarily be avoided by the adoption of a system of access control. Some systems of access control may worsen the consequences, while others may alleviate them entirely. Furthermore, it should not be assumed that the described consequences are the only ones of importance.

If the conclusions of the statement are accepted, the next step would be to examine different systems (and combinations of systems) of access controls to evaluate the costs and difficulties of adopting them and the full range of consequences with regard to all the relevant values to be sought from the use of our fishery resources.

Of the three consequences mentioned above, this paper focuses on the second, which states that in the absence of access controls the costs of fishing will increase as measures to prevent depletion are imposed and that these costs will be borne by the fishermen largely through the imposition of even greater restrictions on their fishing gear and operations.

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The other two consequences are of considerable importance, but their primary effect is on society as a whole rather than on the fishing industry. They do not, therefore, attract strong constituencies nor, unfortunately, do they have much influence on fishery management decisions. Overcapitalization is a waste to society because the excess capital and labor resources used in the fishery make no contribution to the economy, assuming, as is generally true, that there are alternative opportunities for the capital and labor. Although there are difficulties in calculating the amount of waste and different interpretations of the definition of waste, it is quite clear that economic waste exists where access is uncontrolled. The loss, however, is diffused throughout society and even though it is large in the aggregate, there is little incentive on the part of any individual or group to exert political pressure to prevent it.

Similarly, the costs of research, regulation, and enforcement, which may be very high, are borne by taxpayers in general and attract little attention except occasionally from the Office of Management and Budget. For most natural resources, where private property rights apply, these costs are borne by the property owners to a large extent, but in fisheries, where taxes on catch or license fees are nonexistent or negligible, the fishermen make no contributions to the costs of management. These costs are likely to rise as rules and regulations become more complicated and as more restrictions are imposed upon fishing and fishermen.

There are three reasons for focusing on the second consequence—the increase in costs of fishing. First, if decisions and plans continue to be made on the assumption that this consequence can be avoided, it will become increasingly difficult to remove the restrictions and superfluous costs. Second, this consequence has the greatest direct effect on fishermen. If fishermen and the regional management councils can be convinced of the inevitability of this consequence, it may then be possible to deal more directly with the issue of access controls.

Finally, this point has been seriously neglected in the past. Much attention has been given to the problems of overcapitalization since 1954, when Professor H. Scott Gordon first brought them to the attention of economists (4). The theoretical analyses have been examined in much detail and static models are being replaced by more refined dynamic models (5). Recently, some attention has been given to how the effects of different management systems are distributed among fishermen and society (6). But very little has been written or said about the relationship between uncontrolled access and the costs to individual fishermen.

Fishermen, of course, are painfully aware that regulations generally add to their individual costs and that this has been the result ever since conservation regulations were first adopted. This awareness has grown considerably in the past year, particularly in the New England area. The Fishery Conservation and Management Act (or 200-mile law) has not provided the escape that fishermen sought and hoped for. Instead, it appears to some fishermen that the act has simply worsened the situation. A leading New England fisherman said, "The 200-mile law talks of the greatest benefit to society, but I'm not sure anyone is benefiting. There's been too much hardship and heartache. The cure may be worse than the disease" (7). While suffering the consequence of uncontrolled

access, however, fishermen seek to lay the blame on other factors such as too many foreigners, inadequate markets, too much red tape, etc. They continue to look for a way out that will not cost them their freedom. No way exists.

The economic forces at work under the condition of uncontrolled access are described in the next few pages, followed by a discussion of how conservation controls lead to increased costs of fishing. Some current efforts to escape this consequence are also discussed. On the belief that no escape is possible, the question is raised whether the prevention of depletion is desirable and, if so, what forms of access controls will lead to the minimum amount of government intervention and costs to fishermen.

The Costs of Common Property

A common-property natural resource is defined as one for which access is free and open. There are no exclusive use rights and no controls over the amount of capital and labor (or fishermen and vessels) that can make use of the resource. Although there may be difficulties in entering a fishery for a variety of reasons, these difficulties do not necessarily change the condition of common property. For example, the costs of a vessel or particular kind of gear may be very high, it may be difficult to learn the fishing techniques, or the fishing conditions may be hazardous and uncomfortable. Although these may impede entry, the condition of common property will still exist. Access to the resource is still free and open, and the impediments are only relative. If the price for the product is right, the expensive vessels will be built, the techniques learned, and the discomforts accepted. The eastern tropical Pacific tuna fishery provides ample evidence that such difficulties may impede, but will not prevent access.

Resources other than fisheries have also been treated as common property. The air we breathe, large bodies of water, outdoor recreation areas, grazing lands, oil fields, the radio spectrum, and other resources have all been used freely and without restraint in the past. This freedom of use has led to waste in most cases. Some of the consequences are obvious. Broadcasters, for example, cannot use the same frequency in the same region. Free and unstinted use of grazing lands inevitably leads to damage of the grass and ground as demand for use increase.

Physical waste is a direct and inevitable consequence of free and open access to use the resource. If, as is the case with fisheries, there is no effective way to increase the supply of the resource, the growth in use will lead to depletion. Although arguments can be raised over the definition of depletion and its causes, they do not negate the fact that overfishing occurs and generally leads to annual yields that are lower than they could be.

The role of economic forces is critical in this development, even though they are not always recognized. Changes in the factors of demand and supply that lead to either higher prices for the product or lower costs per unit of effort will increase the degree of depletion. Fishermen quite rightly fish for a profit and not for a quantity of fish. If their profit increases because of higher prices or lower costs, they have little concern that their individual catches may be lower than they once were. As Dr. Harden Taylor said twenty-seven years ago, "Scarcity (of the resource) does not appear to have been a calamity to the fishermen" (8).

Changes in the factors of supply and demand have occurred in the past and can be expected to continue into the future. With an increasing population and a growing economy, prices for most fishery products will increase. Generally, a decrease in catch due to overfishing or other causes will also lead to a higher price. In addition, technological innovations will bring about lower costs per unit of effort, although they may be offset in some measure by higher costs for fuel and other factors of production. In short, economic forces will continue to exert increased pressures on the stocks and will exacerbate the problems of management. If decisions and plans are made as they often are on the assumption that such changes will not take place, then these decisions and plans may have short-lived effects.

If it is assumed that depletion should be prevented, an assumption that is examined later, and if the common property condition is maintained, then interference with the economic forces becomes necessary. It is unreasonable and unfair to ask fishermen to impose this interference upon themselves voluntarily and unilaterally. Under the common property condition, anything that a fisherman leaves in the sea for tomorrow will be taken by others today. No fisherman, by himself, can afford to restrain his present catch in the interest of future returns, because this will mean a loss rather than a postponement in earnings. Furthermore, if all fishermen cooperate in restraining present catch, there is no guarantee that they will be the ones to receive the future benefits. If their restraint means higher returns in future years, these increased returns will simply attract more fishermen and force average returns down to the level where they stood before the sacrifice took place.

Since fishermen are unable to exercise the restraints themselves, the interference with economic forces must be imposed by a public agency. This is done in a variety of ways. One is to prohibit technological innovation or to enforce technological inefficiency. Another is to limit the size of fish that can be taken. Others are to close seasons, close areas, and limit the total amount of catch. Each of these kinds of conservation regulations serves to make it more difficult to catch fish and to increase the costs of catching fish, either directly or indirectly.

With most of these regulations, the increased costs to the fishermen are quite clear. In other cases, however, the regulations produce indirect costs which, though they may be large, are not often fully felt by the fishermen. For example, restrictions against innovations, use of certain kinds of gear, or vessels beyond a certain length do not necessarily lead to direct costs to fishermen. Instead, the costs are incurred in lost freedom and, more important, in lost opportunities to improve individual earnings. The latter costs are insidious because they do not have to be paid directly by the fishermen as out-of-pocket expenses. They may, nevertheless, be very high.

As the Alaska salmon fishery developed, restrictions on almost every aspect of fishing were imposed. When limited entry control finally went into effect in 1976 technology had already been frozen, with restrictions on size of vessel, kind of gear, location of fishing, time of fishing, etc. These restrictions were not, of course, effected without opposition, but they were adopted gradually, in small steps, so that no one fisherman had to give up very much at any particular time.

In the aggregate, however, the restrictions have significantly reduced the earnings fishermen could have achieved if innovations had been permitted to proceed in an orderly fashion, with appropriate reductions in the amount of effort. These losses in potential earnings must be considered an increase in costs to fishermen, in addition to the direct costs resulting from other kinds of conservation regulations.

Conservation measures such as total quotas, limits on size of fish, and closed seasons also produce indirect costs for fishermen. In the case of the total quota where fishing must stop after the allowable catch has been reached, fishermen have an incentive to increase the size, speed, and number of their vessels to obtain the greatest share for themselves before the quota is reached and the season closes. Since all fishermen operate the same way, the net result will be a shortening of the season. This may lead to congestion on the grounds and interference of one gear with another. The roe-on-kelp fishery is an extreme example. More often, the damage to fishermen comes from the presence of a large quantity of product on the market in a short period of time, which creates a glut and lowers the prices paid to fishermen. This has occurred in the Pacific halibut fishery (9) and more recently in the surf clam fishery in the Mid-Atlantic and the groundfish fishery off New England. To avoid the glut and to spread the catch over a longer period, Pacific halibut fishermen adopted a voluntary layover program. Quarterly quotas have been imposed on the East Coast surf clam and groundfish fisheries. In the surf clam fishery, fishing has been reduced to one day a week. This leads to a considerable amount of idle time, inefficient use of vessels, and high costs of conversion if fishermen wish to move to other species.

A size limit leads eventually to the same results since there are only so many fish available in any one-year class. Closed seasons are essentially a variant of total quotas and also have the same consequences—higher costs because of the necessity to compete in a race with other fishermen and because of the secondary effects of market glut, idle time, or gear conversion.

In most though not all cases, combinations of conservation regulations are imposed. The net effect, however, is that fishermen bear increased costs, either directly or indirectly, and that they face increased restrictions and greater losses of freedom. These consequences worsen as prices for the fishery products increase. Most regulations are effective only as long as there are no changes in the net economic revenues to fishermen. Any increase in price greater than the increase in costs will produce a surplus profit that will simply attract more fishermen and put greater pressures on the resources. To prevent this, costs to fishermen must once again be increased.

This is not to say that all conservation controls are undesirable. Indeed, many of them are necessary to prevent abuse of the resource and should be imposed whether the fishery operates under the condition of common property or not. But as long as access is free and open, depletion can only be prevented by imposing greater and greater costs on fishermen. From this point of view, it is not surprising that fishermen tend to resent administrators and oppose regulations. Every regulation adopted means higher costs and less freedom for fishermen, for that, in essence, is the purpose of the regulation.

The Inability to Escape

At present, two attempts are being made to escape these consequences and, at the same time, maintain the condition of free and open access. One is to decrease the amount of foreign fish catch within our 200-mile zone and the other is to develop or improve markets for species that are not currently being caught extensively by our fishermen. Whatever merit these approaches may have, they will not prevent the consequences of rising costs from occurring except possibly during a short period.

For those stocks of fish that have been used by both U. S. and foreign fishermen, the removal of foreigners can provide some increased catches for our own fishermen either now or in the future. The size of increase depends upon a number of factors, such as the proportion that has been taken by foreigners, the present state of the stocks, U. S. capacity, etc. Any increase will provide only temporary relief, however, because the additional catches will probably mean higher net revenues, which will attract more fishermen and place greater fishing pressures on the stocks. This will once again lead to the adoption of conservation measures that result in greater costs to fishermen.

The development of domestic or foreign markets for species not presently caught extensively by U. S. fishermen is an attractive proposal. However, the gains to fishermen, if any, will only be temporary and the costs to taxpayers may be high if the development is attempted through direct or indirect subsidies. The development of a market for a new species does little to change the economic characteristics of fishing for the old species. The profitability in fishing the depleted stock will remain. Higher profits in a subsidized fishery may attract some fishermen away from the depleted stock. But if there is no control over access, the profits will also attract new fishermen into both fisheries, driving net returns down to the original levels. Except possibly for a brief interlude, the pressures on the depleted stock will remain the same and respond in the same way to change in price.

Thus, neither of the approaches will provide an escape from the economic forces that lead to the misuse of common property fisheries. Where access is uncontrolled, this misuse is inevitable and, if depletion is to be prevented, it can only be done by the adoption of laws that raise the costs of fishing. Most often these costs occur in the form of greater restrictions on fishing gear, techniques, and vessels, and in the loss of freedom to choose efficient combinations of inputs.

Consideration of Depletion

This raises the question of the desirability of preventing depletion. On one hand, this question has been answered by the Fishery Conservation and Management Act (FCMA), which has chosen "optimum" yield as a replacement for the objective of maximum sustainable yield. This choice recognizes the many difficulties associated with the objective of maximizing sustainable yields and admits that there may be some desirability, under certain conditions, in depleting a stock or in underfishing it. On the other hand, all the fishery management plans that deal with depleted stocks are designed to rehabilitate the stocks and reduce

the degree of depletion. In practice, the FCMA views depletion as an aberration to be tolerated only under certain circumstances and to be overcome wherever possible.

It may be desirable, however, to consider the possibility of permitting extensive, rather than moderate, depletion as a matter of policy. It is conceivable (although admittedly unlikely) that society as a whole would be better off by permitting fishermen to fish with as much freedom as possible subject to the constraint that they do not extinguish a species (10). The only controls that would be imposed would be those that are necessary to prevent extinction, that are the least costly to fishermen, and that are the least costly to implement and enforce. Depending upon the characteristics of the stock, the controls might include closed areas, size limits, total quotas, or closed seasons. There would be no prohibitions against technological efficiency except for those necessary to prevent destruction of the environment, such as through the use of dynamite or poison. In short, under this approach, fishermen would be able to fish as intensively and as freely as they wished up to the point where they threatened the continued existence of a species.

The net result of such an approach is likely to be similar to the developments that have taken place in the Great Lakes over the past fifty years (11). The total quantity of catch may remain about the same, but high-valued species will be replaced by low-valued species. Advantages might be found in a reduction of administrative and enforcement costs and in a reduction of restrictions against fishing techniques. Administrators presumably would not have to undertake the difficult tasks of estimating catching power of different kinds of vessels and would not, therefore, have to make decisions about the distribution of income. Fishermen would still be engaged in a race to maximize their shares of the catch but they would presumably be free from ever-increasing and burdensome restrictions.

However, there are likely to be a number of difficulties and costs associated with this approach. High-valued species would disappear from the market or become luxury commodities. If markets are developed for the species that are presently low in value, the price for these will tend to rise, and attract more effort until they, too, become fished down and acquire the status of luxury commodities. Thus, it is likely that consumers would bear high costs from such an approach.

In addition, it may turn out that the prevention of extinction leads to costs to management and fishermen that are just as high as those incurred in the prevention of depletion.

This discussion of the consequences of minimum controls is purely speculative. It is not suggested that this approach is either appropriate or feasible, but simply that it should be considered (12). The basis for its consideration lies in an examination of the costs and benefits of the alternatives. Without access controls, depletion can only be prevented by measures that increase the costs of fishing and that most likely also increase the costs of research, management, and enforcement. With the appropriate kind of access controls, it is possible that these costs will be reduced (as discussed below). However, if the objections of fishermen to the adoption of access controls are so great that the costs of imple-

mentation and enforcement are excessive, and if the extinction of species can be prevented at relatively low cost, then perhaps the best course is one of "benign neglect."

Access Controls

This raises the question of the desirability of adopting some form of access control. This desirability should properly be examined with regard to the several objectives that are sought from the use of fishery resources. This paper, however, makes no attempt to do so (13). Instead, it continues its very narrow focus on one aspect of fisheries management—the effect of regulations on the costs of fishing to the fishermen.

Any form of access control means that fishermen will lose the freedom that they have had in the past to enter any fishery they wish. This does not necessarily mean that they will not be able to enter a fishery, only that they will not be able to do so freely (14). Those not already in the fishery will have to pay a price, either in the form of purchasing a permit or paying a tax or fee. This constitutes a significant loss of the freedom that fishermen have enjoyed. But it is no different from the cost of purchasing a farm, which a potential farmer must bear in order to enter farming.

The loss of freedom from the adoption of an access control system must be balanced against the loss of freedom from increasingly severe restrictions on fishing. As discussed above, in the absence of access controls, a fisherman's freedom to choose how, when, and where he wants to fish will become increasingly circumscribed, and the costs he incurs in meeting the restrictions will become greater and greater. Since there is no escape from the fact that the days of free fishing are over, the problem facing the fisherman is that of choosing the lesser of two evils.

Access controls will not necessarily reduce the need for continued government interference. They may, however, lessen it considerably, depending upon the form of access control that is adopted. With regard to the allocation of fishing privileges—the determination of who shall fish for what—access controls substitute the market place for administrative decision making. In the absence of access controls, the adoption of conservation regulations almost always has a distributive effect. For example, limiting surf clam fishing to one day a week discriminates against the owners of small vessels that are unable to fish if the weather is bad that day. Where a total quota is imposed, the distribution is in favor of those with the largest and swiftest vessels. As this has become apparent in the New England groundfish fishery, the Regional Management Council has had to make even more explicit decisions on distribution. For example, under the current regulations for cod on Georges Bank, vessels up to 60 gross register tons have a weekly trip limit of 4,900 pounds, vessels from 61 to 125 gross register tons have a limit of 9,800 pounds, and those over 125 gross register tons have a limit of 14,000 pounds (15). In essence, the administrators are determining the maximum incomes that can be received by different groups of fishermen. Furthermore, since there are no controls over access, additional fishermen may enter, forcing the administrators to reduce trip limits (and revenues) in the future.

One of the major benefits of access controls is that, once the permits or shares have been distributed, the determination of who can and who cannot fish is made by the marketplace rather than by administrators. The initial distribution of permits or shares is clearly a difficult task. But grandfathering techniques can be used to minimize the number of fishermen not receiving privileges. After the initial distribution, the privilege of fishing is allocated to those who are willing to pay the price. If a tax system were adopted, even the initial allocation would be determined by the market.

Another important freedom that must be considered is that of the choice of fishing vessel, gear, and technique. In this case, the effect on fishermen is dependent upon the form of access control that is adopted. Of the various controls, the licensing system that limits number of vessels or other inputs would be the least desirable in this regard. It requires continued government interference in fishing operations. A limit on any single factor of fishing automatically stimulates fishermen to substitute other factors for the one that is limited. For example, a limit on the number of fishing vessels provides an incentive for fishermen to use larger vessels. In response to this and to achieve the purposes of the controls, administrators must impose additional restrictions. Eventually, every aspect of a fishing operation will become circumscribed and technology will be frozen. The lesson of the "seepage" effect is clearly demonstrated in the British Columbia limited entry program for salmon (16). Here, the original limit on number of vessels was quickly replaced by a limit on tonnage, because of the transfer of licenses from small to large vessels. With the limit on tonnage, there has been a reduction in the number of gillnet and small troll licenses and an increase in the use of the more efficient seines. In addition, "the efficiency of seine vessels in setting and retrieving nets has increased more than four times" (17). As Dr. Newton has stated, "the concept of reducing regulations as the result of limited entry has been delayed indefinitely" (18). In the case of the Alaska limited entry program, most aspects of fishing were already restricted prior to the program's adoption. Thus, the present technological inefficiencies will be perpetuated into the future.

Except for a license fee, which operates in much the same way as a license limit scheme, the other forms of access controls would free fishermen to a large extent from government interference in their fishing operations. With a fisherman quota system, fishermen would be able to adopt any harvesting technique they wish, short of using dynamite or some other environmentally damaging technique. Given the right to take a certain quantity of fish, as well as the opportunity to lease or buy additional shares, fishermen can adopt technological innovations at an orderly rate free from the fear that an innovation may be outlawed. Under a franchise system, it would be up to the franchise holders to determine the kinds of regulations they wish to adopt and how much effort they wish to invest. A tax on catch, if levied at the appropriate level, would also free fishermen from most of the burdensome regulations now in effect. In short, though freedom of entry into a fishery is sacrificed, some forms of access controls can significantly reduce the amount of government interference in fishing operations and provide fishermen with a greater degree of freedom.

Summary

It should be emphasized that this paper has concentrated on only one of the many factors that need to be taken into consideration in the evaluation of alternative systems for the management of fisheries. Other factors that are equally if not more important are the contributions of fisheries to the national economy, the opportunities for satisfactory employment, the provision of a wide range of food commodities of high quality and low price, and the costs of research, management, and enforcement. It should also be remembered that fish are not a homogenous commodity, either in the marketplace or in the conditions of their production. They differ widely in demand, from low-unit-value menhaden to luxury commodities such as lobster. And the conditions of their harvest differ over an equally large range, from sedentary oysters to highly migratory tuna. Thus, the evaluation of alternative systems for management is complex in every regard and there are no simple and single techniques that can meet every need.

In spite of this range of characteristics, the conditions of common property is a common element that is critical to all fisheries. It has provided fishermen with a freedom unlike that of any other commercial enterprise. This freedom can no longer be maintained in all its aspects. No matter what management technique is adopted, the historic freedom that fishermen have enjoyed will disappear. If there is no control over access, fishermen will lose their freedom to choose when, where, and how they want to fish. If there is control over access, they will lose their freedom to enter, at no cost, any fishery they wish.

LIMITED ENTRY

AS A FISHERY MANAGEMENT TOOL

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