

1

Introduction: Limited Access, What is it and why?

DANIEL D. HUPPERT

Southwest Fisheries Center

National Marine Fisheries Service, NOAA

P. O. Box 271

La Jolla, CA 92038

Despite its wide acceptance in other fisheries, limited access remains a controversial topic among Pacific coast groundfish fishermen and fishery managers. It is controversial because it immediately opens a wide array of public policy issues. How should the public conserve fish stocks, and who should benefit from harvesting those fish? What are the costs and benefits to the public, the taxpayer, the fishing industry, and the coastal communities supporting the groundfish industry? Should the government push the industry to be economically efficient in harvesting; or should it discourage technical efficiency to conserve fish stocks? Should management preserve the economic status quo by protecting existing harvest shares? These are the broad issues occupying the discussions of policy makers and academic writers concerned with resource management.

The goal of this introductory section is to define limited access, to dispel some basic misunderstandings about limited access, to clarify the optional forms of limited access, and to review the various resource management objectives addressed. This should set the stage for the following more lengthy discussions. By reducing the scope of needless misunderstandings, it should also help to make future discussions of limited access more productive.

WHAT IS LIMITED ACCESS?

Limiting access in commercial fisheries is commonly implemented through either license limitation programs or assignment of quantitative harvest rights. License limitation, most commonly known as "limited entry," is the simplest and most widely used form of limited access in the United States. A license limitation system issues permits to specific individuals (usually fishermen or fishing vessel owners) and prohibits landings by those not having a license. As will be explained at length in later chapters of this report, licenses can be annually renewable or perpetual fishing rights; they may be openly tradeable or strictly assigned to a particular person; they may be specific to a gear type or species of fish. A wide range of conditions and limitations can be placed upon the exercise of the fishing rights bestowed through issuance of a license.

Rather than simply identifying who can fish, quantitative harvest rights designate how much each license-holder can take. Like license limitation, a quantitative harvest rights system can take on a number of different characteristics. A variety of terms have been coined for the various quantitative harvest rights schemes. These include (1) individual fisherman quotas based upon Francis Christy's original proposal in 1973, (2) individual tradeable quotas as recently adopted in New Zealand (Clark and Duncan 1986), (3) quota licenses as proposed by Canada's Commission on Pacific Fisheries Policy (Pearse 1982), and (4) quota shares or allocated vessel quotas (Clark 1980) which represent individual shares of total allowable catch. Throughout most of the discussion we will use the term "individual fisherman quota" (IFQ), recognizing that individual quotas may be allocated to vessel owners or fishing enterprises rather than to fishermen per se. Regardless of what term is used, a quantitative harvest rights system controls the total harvest by distributing harvest shares among participants in the fishery.

To some degree all fishery regulations dictate the conditions under which fishermen are allowed access to fish stocks. Traditional forms of fishery regulations—including harvest quotas with season closures, gear requirements, size limits, and trip limits—restrict access to fish stocks. This is an inherent part of defining terms and conditions for legal resource use. To control annual harvests, these

regulations must reduce the level of fishing effort from what it would be without regulation. Hence, all fishery conservation regulations, both traditional fishery regulations and limited access, conserve fish stocks by controlling the level of fishing effort, and this requires placing limits on use of the stock.

What then is the essential difference between a limited access system and the traditional approach to fishery regulation? The main difference is that traditional regulations seek directly to control harvest levels without saying who should be allowed to take a portion of the total allowable harvest; limited access systems begin by identifying who is permitted to harvest and, optionally, how much they are allowed to harvest. Traditional regulations control aggregate fishing mortality; limited access establishes limits to individual fishing rights.

Limited access will not necessarily supplant all traditional regulations. License limitation, for example, does not directly control the level of harvest by license-holders. Consequently, it may need to be supplemented by fishery-wide quotas and technical restrictions on vessels and gear. Similarly, even though an individual quota system inherently controls total harvest, additional regulations may be needed to achieve optimal utilization of the fish stocks. This is especially true in multi-species, multi-gear fisheries where it is desirable to control size-at-capture, incidental catches, and discards.

Limited access is commonly practiced without government regulation. Common law gives property owners exclusive (but limited) rights to use, to prevent others from using, and to sell property. There are cases of limited access without legal sanction, such as in the famous Maine "lobster fiefs" (Acheson 1975) in which fishing rights to local areas were recognized based upon historic or cultural tradition. Private rights to land, forests, and other forms of property imply limited access and use. The point is that access to the resource for harvesting purposes is limited to some identifiable set of people. Where legally defined rights exist, the owners of these rights may sell, trade and bequeath the rights to others. Because rights can be sold, the identity of resource owners and users may change over time. Access to the resource is limited to those who possess use rights; but the right to acquire ownership is open to all those who wish to obtain use rights by paying the market price or complying with state-imposed qualifications.

All property rights are circumscribed by the law. An owner of urban land must comply with zoning laws. An owner of cattle can continue to feed the animals or slaughter them for market, but he/she must obey law concerning cruel treatment of animals. Ownership in a limited access system permits harvest under specific conditions, but does not permit liquidation of the fish stock. The fish stock in the ocean remains public property managed by the state as a public trust. When licenses and IFQs are marketable, they take on many characteristics of property, including a market price. Nevertheless, fishing rights are use rights, and these are not the same as property rights in the fish stock itself.

WHY CONSIDER LIMITED ACCESS? WHAT'S DIFFERENT ABOUT FISHING? _____

Commercial fishing differs from farming, small-scale retailing, and other competitive American industries in many respects; the most important is the lack of private property rights in an essential resource. Unlike farmland and mineral deposits, marine fish populations cannot be owned by the users. Historically, in western Europe and North America, property rights to marine fish stocks did not evolve in parallel with rights to land-based resources. Two principal reasons for this are apparent. First, it was not until the rapid expansion in world fishing after World War II that conservation of marine fish stocks was recognized as a serious and widespread problem. So long as people believed in the inexhaustibility of marine fish, there was no widespread desire to develop institutions for limiting access to fisheries. Second, creation and enforcement of rights to marine fish are difficult tasks. Fish are not easily observed and fenced like a plot of land. To establish, enforce, and exchange property rights to fish requires special institutions, legal mechanisms, and ways of doing business.

Today, Pacific coast groundfish stocks are open access or common property resources. With open access resources, there are no restrictions on who can harvest or upon individual harvest levels. An open access resource is literally no one's property (not strictly property at all). In contrast, a common property resource is owned by members of a group or community. Owners have equal use rights. From the standpoint of licensed commercial fishermen, a license limitation system converts a free access resource into a common property resource. Although the licensed fishermen are not legal owners, they become a closed group of resource users, like the animal grazers using a common pasture. With either open access or common property, competitive free enterprise among resource users cannot be expected to assure adequate resource conservation. Additional restrictions on harvests are needed. This need has long been recognized, and it is the reason for public fisheries management.

Harvesters of an open access or common property resource often fail to take appropriate conservation action. It may not be readily apparent to an individual that his use affects the resource size and, ultimately, the profits of all resource users. When there are a myriad of others fishing, a single fisherman will have difficulty even detecting the effect that his own catch has on the overall abundance of fish. Even when fishermen are aware that they affect the size of fish populations, they may take no conservation measures unless they are assured that other users will act in concert to achieve the future benefits of conservation. New entrants may dilute the benefits of conservation when economic returns show improvement.

Thus individual actions, based upon self-interest, cannot assure adequate conservation and cannot effectively promote long-term economic returns from common property or open-access natural resources. Collectively, however, resource users can gain through appropriate restrictions on use. This is true of groundwater basins and public grazing lands as well as fish stocks. Restrictions on individual resource use can be effected through cooperative agreements among users, through certain regional resource agencies like water districts, or even through Federal regulations. In all cases, optimum management requires that individual incentives for short-term economic gain be brought into line with sustainable levels of use.

Regulation of water and grazing lands normally involves quantitative limits to individual use. In medieval England many villages had commons which were regulated through "stinting," a term for

limiting the number of animals grazed by individual peasants. These rules for common property use continue in modified form to modern times. Similarly, sheep and cattle ranchers using public grazing lands in the western United States are allocated so many "animal unit months" (AUMs) which roughly corresponds to a known quantity of forage harvested. Farmers irrigating fields in central California each have a quantity of water to which they are entitled. This entitlement may be attached to the land as a water right. These water and grazing rights are forms of limited access in that they designate both (1) which individuals have use rights and (2) the amount of use allowed.

These forms of limited access are not intended to prevent people from becoming farmers or cattlemen. There is no list of licensed or "qualified" farmers. If you want to try your hand at raising almonds in Kern county, California, you can buy or rent land and obtain the necessary water rights. There is free entry to the industry. Fishing, farming, and retailing are similar in this important respect. To exercise this right of free entry, a business firm must acquire the necessary implements and materials. In farming or ranching one requirement is a source of water or rangeland forage. In an open access fishery, however, a new entrant cannot acquire rights to a given quantity of fish. A newcomer simply dips into the common pool, often taking a portion of the available harvest away from established fishermen.

Rather than establish a limited number of quantitative use rights, groundfish managers have established aggregate harvest quotas (or guidelines) and have instituted other restrictive rules on fishing enterprises in order to achieve economic and social objectives. Individual fishing firms then compete for fish based upon harvesting capacity and skill. When quotas are inappropriate, managers may prefer to restrict effectiveness of the gear (such as maximum allowable length of gill nets) or the portion of the stock that is vulnerable to harvest (mesh size regulations, for example). Pacific coast groundfish regulations incorporate many of these methods. While these harvest regulations may adequately prevent fish stock depletion, they do not address a number of other problems.

Economic and social problems frequently occur in quota-regulated open access fisheries. Some of these problems are:

(1) Economic profits are lost to increased fishing costs. Because individual fishermen can maintain or expand their individual harvest shares only by catching fish at a faster rate, they tend to compete by increasing fishing capacity. This is costly for the individual vessel owner, but may result in increased earnings for the vessel. When the fish stocks are under quotas, increased fishing capacity results in no increased fish catch but does raise the total cost of taking the quota.

(2) Overcrowding and gear conflicts occur. Fishermen concentrate in the best fishing areas and during the best fishing seasons. In some cases this results in a very short and furious fishing season which may pressure individual fishermen to operate under unsafe conditions. This can cause loss of gear and can increase the cost and risk in operating a fishing vessel.

(3) Economic instability due to changing profits and harvest regulations. Excessive numbers of new entrants are often attracted to fisheries during periods of higher-than-normal profits. Many of these new firms will go bankrupt under normal circumstances, leaving the fishing fleet overbuilt and with many small firms in financial trouble. While cyclical instability affects many industries, its impacts are amplified in quota-regulated commercial fisheries. This instability is often further amplified by changing harvest regulations. When new vessels swarm into a fishery during good years,

managers will tighten the harvest regulations in response. Unstable regulations make it more difficult for established fishing vessel owners to plan for the longer term.

(4) With large amounts of redundant harvesting capacity, regulatory burdens and management costs become excessive. To assure adequate fish stock conservation, there must be restrictive fishing regulations. Annual quotas may be augmented by trip limits and other restrictions. To implement regulations there must be many committees, hearings, and enforcement agents. The resulting regulatory bureaucracy is costly.

Limited access to commercial fisheries is in part a response to these social and economic issues, but it may be used also as a resource conservation tool in heavily exploited fisheries. Some Australian license limitation programs, for example, were adopted early enough in the developing fishery to prevent extensive over-expansion of fishing capacity. This provides a substantial measure of protection to the fish stocks. A similar degree of conservation could be achieved in heavily exploited fisheries by license limitation followed by fleet reduction, or by IFQs.

OTHER UNCONVENTIONAL APPROACHES TO RESOURCE CONSERVATION

It should be noted that license limitation and IFQs are not the only alternative approaches to common property resource management currently under serious discussion. A radically different approach would be to levy taxes or royalties on fish landings. This sort of approach has been given serious consideration in designing programs to reduce air and water pollution (e.g., the so-called "pollution taxes"), and public interest groups have pushed proposals to increase charges for irrigation water and for use of public grazing lands where those resources appear to be overused or misused. The basic logic of a tax charge is that it changes economic incentives in the correct direction.

Firms using common property resources and firms relying on publicly subsidized resource development projects, do not bear, nor do they adequately take into consideration, the full cost of resource use. This is related to lack of private property rights. The fishing firm does not have a direct financial interest in the economic value of the fish stock; its only interest is in the portion of the stock that it can capture and sell. Consequently, the cost of reducing the fish stock (i.e., reduced catch rates for all firms and reduced future availability of fish) is not felt directly by the firm and it does not consider that cost in deciding how much to harvest. A rancher, on the other hand, must account for the effects of a reduced herd on the book value of his livestock. Similarly, a hypothetical private fish stock owner would bear the cost of a deterioration in his fish stock. The prospect of reduced asset values associated with over-fishing would act as a strong incentive to harvest at an economically efficient level. Since firms fishing on a common property stock do not experience the reduced asset value, they do not have the proper incentives to conserve. One solution is for a public agency to compute what that asset deterioration cost should be and establish a royalty fee equal to that cost. After that, the private firms will have the proper disincentives to overfish.

This proposal has been described in textbooks and academic papers, but has never been applied to a fishery. Some reasons for this are apparent. First, fishery managers are most frequently trained in scientific disciplines that do not explore taxation as a means of regulating behavior. Thus the royalty scheme is generally proposed

by an "outsider" and is given less serious consideration than other direct forms of regulation. Second, the political machinery is strongly geared to protecting the rights and financial interests of current resource users. Since the harvest royalty would, at least superficially and in the short run, reduce the income in fishing, it would work to the disadvantage of exactly those resource users who are most clearly represented in the political process. Even though various provisions could be developed to reduce the short-run burden on fishermen and to assure that revenues raised by the royalty were used for resource protection and enhancement, this political aspect raises strong objections to using royalties as a resource management tool.

Other practical reasons for not using landings taxes to manage fish stocks are (1) the computational task is extremely formidable, and (2) the necessary flexibility in tax rate may be difficult to attain in a legislative system. Because the royalty or tax should equal the cost associated with reduced asset value of the fish stock, the tax would have to be adjusted as fish prices, fishing costs, and fish stock abundances change. Given the imprecision in fish stock assessments and the frequency of changes in prices, it is unlikely that the tax rates could be accurately computed and adjusted. Whether the imprecision in tax rates would create more difficulties than, say, imprecision in harvest quotas is a topic for future research and discussion.

Also, authority to set tax and royalty rates is not now delegated to state fish and game agencies or to the Pacific Fishery Management Council. Thus the legislatures would have to change tax rates in a timely and appropriate fashion, or they would have to delegate such power to managing agencies or commissions. It might be possible to develop legislation that would allow agencies to vary royalty rates based upon economic and biological criteria. Because this sort of system has had little political support, it has not been thoroughly examined. Further work may reveal promising alternatives for tax or royalty management, but this will require longer term research and development than license and IFQ options.

OBJECTIVES OF LIMITED ACCESS _____

Limiting access to commercial fisheries can address a great number of different objectives. Some of the more prominent objectives are as follows:

1. Promote economic efficiency in harvesting.
2. Establish stable and secure tenure to the fishery for licensed fishermen.
3. Enhance the value of fishery products delivered to consumers.
4. Increase and stabilize the profitability of the fishing fleet.
5. Reduce the burden of management regulations on the industry.
6. Reduce the cost of fisheries management born by the public.
7. Secure an equitable distribution of benefits from the fishery.
8. Protect various segments of the fishing industry from other fishermen and non-commercial interests.
9. Help restrain fishing effort and conserve fish stocks.

This list does not include every conceivable objective, but it does illustrate the broad range of considerations that can be addressed. A brief explanation of these objectives will help to focus the discussion.

Economic efficiency in harvesting involves delivering the available raw fish to dockside with the least possible cost expended on

fishing, and delivering the fish in appropriate condition and on a time schedule suitable for marketing. Because open access fisheries normally exhibit substantial excess fishing capacity, which is controlled by quotas and other economically inefficient regulations, substantial advances may be made toward this goal through limited access. To actually calculate an efficient harvest program is a difficult task that is rarely attempted. It was recently estimated that an efficiently operated Pacific coast groundfish fishery could generate between \$7 million and \$17 million annually in net economic benefits. This could be accomplished with a fishing fleet approximately 40% smaller than the fleet operated in 1984. Where the total falls in this range depends mainly on the size of the Pacific whiting fishery. (See Chapter 5 for details.) A new limited access system may not be able to achieve the estimated level of economic gains, at least not without a moderately long adjustment period, but the potential gains are sufficient to make increased economic efficiency an important objective.

Secure tenure in the fishery has at least two dimensions. It means that a fisherman does not have to perform up to a particular state-imposed standard in order to continue in the fishery, and it means that a fisherman is assured of future benefits from sacrifices made to conserve fish stocks. In open access fisheries, and in some license limited fisheries, a fisherman cannot reduce his fishing or stop fishing temporarily in hopes of harvesting larger or more numerous fish later. With secure, individual fishing rights, however, a fisherman can afford to fish more slowly and to wait until fish are of optimal size or in optimum condition.

The quality of fish delivered to market may be improved under a limited access system. Fishermen and processors operating under open access are sometimes forced to compete for fish by harvesting in a hurry. This may result in increased occurrence of spoiled or unnecessarily frozen fish products. This is especially a problem when traditional quota management results in short fishing seasons that overwhelm the processing and distribution sectors. If fishermen are given individual quotas, they are free to stretch out the fishing over a longer period of time. Recent Pacific halibut experience provides the classic example of open-access fishing causing so short and furious a fishing season that costs of processing and storing the high-valued product are higher than necessary, and almost all the fish have to be frozen.

Profits are usually highest when fishing fleets begin exploiting a new fish stock or have a particularly large year-class of traditional fish stocks. The usual tendency, however, is for profits to fall as additional vessels are attracted. If the fleet size grows as the fish stock is depleted, then a period of serious economic dislocation may ensue. Recent experience with rockfish stocks off the Pacific coast provides a case study in this process. A properly managed limited access system would be able to prevent the instability in profits by attenuating the growth and decline in the fishing fleet. Higher fleet profits can be earned when the numbers of fishing vessels are just sufficient to harvest the available yield. Sustained high profits require stability in market prices, costs, and fish stocks. Limited access cannot provide stability in all these, but it does remove one common source of economic instability and should result in higher average annual profits.

Reducing the burden of fishing regulations on the industry is an appropriate goal, but it is unclear what particular change in regulations constitutes a reduced burden. Regulations on gear quantity or design, commercial fishing seasons, and "trip limits" may be viewed as a burden. From an economics perspective, all these forms of regulation cause private fishing operators to incur additional costs. By establishing a reduced and more efficient fishing fleet, limited

access may permit some of the regulations to be removed. Whether such a change would result in an overall reduction in burden of regulations is largely a matter of definition and perception.

Reducing the public expenditures on management would relieve the taxpayer's burden of fishery regulations. The current groundfish management system uses public resources to perform necessary biological research and fish stock assessments, to monitor fish landings, to support Coast Guard and State marine enforcement operations, to carry out legal sanctions against violators of regulations, and to make public decisions on management plans. A recent rough estimate of costs associated with Pacific coast groundfish indicates that about \$5.5 million is spent on resource assessment, and \$5.6 million on management, enforcement, coordination, and communications. (See Chapter 6 for details.) Costs of managing a fishery will, of course, depend partly upon the character of the fishery and partly upon the types of regulations promulgated. If limited access is conducive to lower management costs, this should be an important consideration.

Everyone agrees that fishing regulations should entail an "equitable" distribution of benefits. Although there is no widely recognized definition of equity, there are clear patterns in management practice. In a recent study of twelve government programs that allocate property rights, Rolph (1983) found that policymakers deal with the equity issue by designing regulations to minimize any redistribution of wealth. Where established resource users enjoy benefits of a communal resource (such as in land development, air pollution, groundwater pumping) "the judicial, the legislative, and the executive branches have uniformly supported the claims of historic users when allocating rights." This principle seems to be honored as well by the existing fishery limited-access system. A reasonable way of dealing with the equity question, therefore, may be to assure that no established fishermen suffer a measurable loss due to the access regulations. As a first approximation this can be accomplished by retaining historic allocations of catch among existing gear types, vessel size classes, and geographic subdivisions. Where rapid changes have been occurring in the fishery, it is not clear that historic shares preserve the economic status quo. New entrants and previous operators with new vessels may pose a problem, for example. Nevertheless, initial preservation of historic catch shares under a limited access system provides a simple and operational means of dealing with the equity effect of the new system.

To protect various segments of the fishery from one another may be more than just another form of the equity issue. Where recreational or environmental interests collide with commercial fishing interests, a limit to commercial fleet size may help to quell strong political and economic forces that could eliminate the fishery entirely. California has adopted license limitation programs in the drift gill net swordfish and shark fishery and in the northern California set gill and trammel net fishery in order to deal with politically potent rivalries between user groups. Limited access has proved to be a useful tool for staking out territories and limiting the range of conflict.

Finally, limited entry can assist in conserving fish stocks. In the case of license limitation, the control over fishing effort may be too weak and ineffectual to assure fish stock conservation. On the other hand, an individual quota system provides direct controls over total harvests and may be a useful substitute for other forms of effort regulation.

No single system of regulation could address all nine of these objectives simultaneously and with equal success. A limited access system must be tailored to the specific objectives sought. And it

must address the various private and public interests reflected in the objectives discussed here.

CONCLUSIONS

Several conclusions from the preceding discussion are worth repeating and summarizing. First, a limited access system is basically a social mechanism for reducing the excessive competition for fish that occurs when fish stocks are open to all comers. It is an alternative or a complement to traditional quota, season, and gear regulations. Among the alternative regulatory systems, it is uniquely able to address economic efficiency of the commercial fishing industry. In fisheries that are already highly regulated like Pacific groundfish, limited entry should be viewed as one component of a multidimensional management strategy. The choice is not between limiting access to the fishery or having a free and open commercial fishery. Rather it is between one set of regulations on competitive fishing and another set.

Second, there are several varieties of limited access. The two alternatives receiving the most attention are license limitation and IFQs. With either major type of limited access there are numerous variations in detailed application. Much public discussion and participation should be devoted to determining exactly what features to include in a limited access program for any particular fishery. The ultimate allocation of benefits from the fishery would depend upon the detailed decisions made in designing an actual limited access program.

Third, the problems of economic competition for common property or open access resources are not unique to fisheries; adoption of limited access rules are implicit in many other economic systems, including that of private property resource ownership. Rules for use of rangeland, groundwater supplies, and the air have similar features to fishery regulations. While the elusive marine fish populations are not susceptible to subdivision into pieces of private property, the limited access approach attempts to generate some of the conservation and economic benefits that flow from a free enterprise, private property system.

Finally, it is clear that selection of management method determines what fishing rights or privileges, with corresponding economic benefits, are enjoyed by commercial users of the fishery resource. When a season closure or a license limitation is adopted by the fishery management authorities, the fisherman's economic gain from fishing is altered. Thus the nature of fishing rights or privileges is subject to change at the discretion of fishery councils. Commercial fishing rights are not "inalienable rights" like the right to free speech. They are even less secure from political meddling than standard property rights applying to one's personal possessions. To the extent that a limited access system does establish broader and more secure fishing rights, it will place the fisherman in a position much closer to that of a property owner. But the key decisions will remain those of the public managers whose trust responsibility is established by the various state and federal laws.