

The Design and Use of Limited Access Privilege Programs
November 2006

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Overview

The purpose of this document is to provide guidance to the Regional Councils and NOAA Fisheries Service as they design and implement market-based fishery management programs. The guidance is based on the recently reauthorized Magnuson-Stevens Act (MSA). The basic philosophy underlying the guidance is that the Councils should have as much latitude as possible as they design fishery management programs, subject to the constraints in the MSA and other applicable law. This flexibility pertains to the choice of whether to use a market-based approach, and if so chosen, the type and the construction of that program. This document provides information on the important issues that must be addressed for each of the allowable types of market-based programs. In addition, through a presentation of theoretical and practical examples, it provides a discussion of the pros and cons of the various options for addressing those issues. The guidance herein is not mandatory; it is intended simply to inform and help managers make present and future decisions.

Over the years market-based programs have been referenced in many different ways, both in the US and around the world. Originally, they were called Individual Transferable Quotas (ITQs) or Individual Fishing Quotas (IFQs). Most recently, the US Ocean Commission used the term Dedicated Access Privileges (DAPs) to expand the emphasis beyond “individual” control and to stress that what is owned is something less than a complete property right *per se*. The term of reference that will be used throughout this document is Limited Access Privilege or LAP.

The MSA does specify some mandatory conditions and provision for designing LAP programs that are discussed below (See Sec. 303A (a), (b), (c,1), (c,2). [Insert proper citation after bill is passed]). In addition to complying with these mandates, the basic guidance to the Councils can be stated as follows. If a Council wishes to develop a LAP program, they should use the National Standards, other applicable law and the management objectives of the particular FMP as the criteria for selecting and designing a LAP program. The choice and construction of a LAP should be based on a conclusion that it will be the most likely to achieve those objectives among all other management strategies considered. The MSA implicitly includes this guidance when it mandates that Councils must specify the goals of any LAP program and include provisions for regular monitoring and review to ensure that the goals are achieved. See Sec. 303A (c)(1) (F) and Sec. 303A (c)(1)(G). [Proper citation]

There are additional criteria used throughout the document to help evaluate the pros and cons of different design and implementation choices associated with LAPs. The criteria discussed are not necessarily unique to LAPs and could be used to compare the strengths and weaknesses of any type of management strategy. Given the relative newness of and limited experience with LAP usage, such a comparative framework seemed an efficient means to assess different LAP features. Table 1 describes/lists the series of comparative criteria used throughout the document.

One criterion is internal consistency. It is important to ensure that the option chosen for one component of the plan (e.g., transferability) does not work at opposite purposes with the option chosen for other components (e.g., specification of management unit). One of the purposes of the guidelines is to discuss how choices in one area can complement or contradict choices made in others, while recognizing the inherent tradeoffs inherent with different management objectives.

Table 1

Criteria for Evaluating LAP Programs

Compliance with the National Standards and other mandates of the MSA and other applicable law.

Consistency with Council determined management objectives for the fishery under consideration.

Internal consistency.

Level of complexity.

Compatibility with other related FMPs.

Operational effectiveness

Cost of implementation and operation.

A second criterion is the level of complexity. It sometimes may seem necessary to adopt some special “bells and whistles” when addressing a particular component to achieve certain management objectives. For example, while transferability may be allowed, the Council may find it desirable to restrict transfers between boats with different gear types or different ports. However, such restrictions make it more difficult and confusing for individuals to operate within the system, reduce the efficiency of the harvesting sector and inhibit mutually-beneficial transfers between privilege holders, and can thus increase the management cost of implementing and monitoring the LAP program. Councils should carefully weigh the trade-offs between designing special rules and conditions to meet management objectives, versus the increased direct and indirect costs such complexity can generate.

It is also important to consider the compatibility of new LAP programs with other existing LAP and non-LAP management programs developed by the Council. In New Zealand, for example, there is only one ITQ program for all the different federally managed stocks. The rules governing transferability and other aspects of ITQs are the same for all the different fisheries. This consistency helps keep management and monitoring costs down. On the other hand, by the nature of the eight Councils under the MSA, the U.S. LAP programs will be designed individually in the various regions, sometimes fishery by fishery. If they are designed completely in isolation, there is the possibility that there could be significant differences with respect to various components which could complicate and increase the costs for implementation and monitoring. Moreover, from the industry perspective, multiple LAP rules and conditions for fisheries within an FMP, across FMPs, and across Council jurisdictions can be very confusing and run counter to efficient business planning and conduct. Councils should make every effort to ensure that LAP programs for similar fisheries under their jurisdictions are, where practicable, as much the same as possible.

The complexity and the compatibility issues are related in that they both can affect operational effectiveness and costs. The arguments for operational effectiveness are self-evident and it is always a main focus for Councils as they prepare plans. However, the separation between who designs a plan and who pays the implementation costs can sometimes cause a disconnect such that costs do not get enough consideration in the plan development process. One of the purposes of this document is to ensure that the cost of implementing plans is given the attention it deserves. This is important because, in some but not all cases, LAP programs can significantly increase management costs (GAO, 2005). From an overall management perspective, the important bottom line is the difference between the benefits of a plan and its costs. And over time it has been shown that the extra benefits from using LAPs are worth the extra costs.

In times of constant or shrinking federal budgets, obtaining the funds to pay for new management plans is a real concern. Congress implicitly took this into consideration by mandating a cost recovery program for LAP programs. However, there is a cap on the amount that can be collected equal to 3 percent of the ex-vessel value of the fish harvested under any such program. If the incremental costs of implementing a LAP program in a particular fishery are less than the amount that can be collected through cost recovery, the funding problem goes away (that of course does not mean that it is not important to design the most efficient program). Note that cost recovery is only applicable to the management (including data collection and analysis) and enforcement associated with LAP programs. The costs of developing and implementing the programs are not subject to cost recovery.

There is a potentially significant problem in those cases where the incremental costs of implementing and operating a LAP program will, on average, be greater than 3 percent of the gross revenues of the fishery. Money to fund the extra costs of the LAP program will have to come from the current budget. This means that there will have to be cuts elsewhere. The alternative is to disapprove a FMP (or parts of them) where cost recovery and appropriated funds are insufficient to initiate a LAP program.

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Returning to the description of this document, it is important to remember that as LAP programs are developed, there are certain things that the Councils do, and there are certain things that NMFS does. Generally, the Councils design the programs while NMFS implements and monitors them. There is a range of choice in the first task, while there are accepted practices for doing the second task. While consultation with the Councils is common for some aspects of implementation and monitoring, other aspects are done solely by the agency. Accordingly, after a brief introduction, there are two main sections to the document. The first section is “guidelines” for developing LAPs, and the second section discusses LAP implementation and administration. The purpose of including the second section is as context for the Councils as they design programs. The idea is that they will be able to do the best job of program design if they thoroughly understand the issues of implementation and monitoring. Throughout the document are “spotlights” on existing or imminent LAPs in the US that describe their design and implementation and are used as case examples. A references/bibliography section is followed by two appendices that describe in detail the issues of excessive shares and the use of auctions.

PART: 1 Introduction

Open Access to Limited Access to Access Privileges.

The purpose of this work is to provide technical guidance to the Regional Management Councils as they prepare FMPs for Limited Access Privilege (LAP) Programs. LAP is the Congressional equivalent of the term Dedicated Access Privilege (DAP) introduced by the US Commission on Ocean Policy. In their report, define a dedicated access privilege as an

output control whereby an individual fisherman, community, or other entity is granted the privilege to catch a specified portion of the total allowable catch. With this assurance in place, there would no longer be an incentive for fishermen to fish harder and faster because each could only catch his or her share of the total. The incentive would then be to catch the full share at a low cost and sell the best quality fish at the highest obtainable price. (page 287).

The term dedicated access privilege is relatively new. These types of programs are more commonly called individual transferable quotas (ITQs), individual fishing quotas (IFQs), or more generally rights-based management techniques. The Commission stated a preference for the term DAP for several reasons.

First, it highlights the fact that fishing is a privilege, not a right. Second, it is an umbrella term that includes access privileges assigned to individuals (ITQs, IFQs, individual gear quotas), as well as to groups or communities (community development quotas, cooperatives, area-based quotas, community-based quotas). Finally, it reflects the fact that the dedicated privilege being granted is access to the fish, rather than the fish themselves. (page 288)

To set the stage of this discussion, it will be useful to consider a very short and somewhat simplified history of the evolution of fishery management techniques.¹ Until the end of the 20th century, most U.S. fisheries were managed under a system which allowed free access. There were few limits other than obtaining a readily available permit and the possession of the necessary fishing gear. In profitable fisheries, this led to ever-increasing numbers of participants which put increasing pressure on the fishery resource.

Seeing the problems of free access, managers began to implement programs which, while not limiting the number of fishermen, began to place controls on their activities. They used input controls such as specifying allowable types and amounts of gear and methods, and limiting available fishing areas or seasons. By restricting what operators can do, this type of regulation increases the cost of fishing and creates incentives to changes fishing procedures so as to increase catch given the constraints. This has the twofold effect of decreasing the biological effectiveness of the regulation and increasing the cost of fishing even more.

¹ This material draws heavily on the discussion in the Ocean Policy Report starting at 287. *The design and use of limited access privilege programs.* November 2006 Preliminary Draft

They also used output controls such as setting total allowable catches (the amount of fish that may be taken by the entire fleet per fishing season), bycatch limits (numbers of non-targeted species captured), and trip limits for individual fishermen. These management techniques create incentives for fishermen to develop better gear or to devise new methods that allow them to catch more fish, and to do so faster than other fishermen, before any overall limit is reached. Neither input nor output controls provide incentives for individual fishermen to conserve fish, because any fish not caught is likely to be taken by someone else.

The struggle to keep catches high that is part and parcel of either input or output controls, creates an unfortunate game between managers and fishermen where the fishermen always have the last move. In response to each new measure designed to limit fishing effort, fishermen develop new fishing methods that, although legal, undermine the goal of reaching sustainable harvest levels. This prompts managers to promulgate more restrictive measures and fishermen to develop more ingenious methods to work around them. For example, if managers limit the length of the boat, fishermen might increase the width. Instead of trying to build boats and design equipment that can harvest efficiently, fishermen have incentives to do everything in their power to catch fish fast with output controls, or to get around the constraints imposed by input controls. In the short run, such regulations can work because it takes time to adjust. However, the (temporary) increase in stock size just helped to finance changes in such things as boat design.

In addition to conservation concerns, the race for fish can create safety problems. Faced with a sharply curtailed amount of time in which to harvest, fishermen often feel compelled to operate in unsafe weather conditions.

As a next step in the development of modern fishery management programs, managers started to limit the number of participants by implementing limited access programs. Although they are common now, they were very controversial when they were first implemented because people thought they had a basic right to fish and limited license programs contravened that right. But at the end of the day, these limited license programs were just another type of input control. In most cases, the status quo input or output controls remained in effect. In some instances these limited access programs were of little use because the number of permits did not place an effective binding constraint on the participants. In those cases where they did form a binding constraint, they did partially circumscribe the problem. At least there were a limited number of individuals who could join the race for fish or the race to improve the fishing power of their vessels. Depending upon the actual number of permits relative to safe harvest limits, the types of other management controls, and on the potential for input substitution in the fishing process, a limit on the number of participants could sometimes be effective for holding harvest at safe levels, at least for the short run.

Where the conditions were not right and harvest levels tended toward unsafe levels under limited access programs, the next logical step was to specify the access control in terms of output. To solve the race for fish problem, managers began exploring the use of

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individual fishing quotas (IFQs), whereby an individual fisherman is granted the *privilege* to catch a specified portion of the total allowable catch. Since IFQs were tied to TACs, they were an output control. With the assurance of a specified share of the TAC, there is no incentive for fishermen to fish harder and faster. The incentive is to catch the full share at a low cost and sell the best quality fish at the highest obtainable price.

Over time the concept of IFQs has been expanded and is referred to as Limited Access Privileges in the amended MSA. There are several different types of these privileges:

- Individual fishing quotas (IFQs) allow each eligible fisherman to catch a specified portion of the total allowable catch. When the assigned portions can be sold or transferred to other fishermen, they are called individual transferable quotas (ITQs).
- Community quotas grant a specified portion of the allowable catch to a community. The community then decides how to allocate the catch. For example, the Community Development Quota Program in Alaska granted remote villages a portion of the total allowable catch to enhance fishery-based economic development.
- Cooperatives split all or part of the available quota among various fishing and processing entities within a fishery via contractual agreements.
- Geographically based programs give an individual or group dedicated access to the fish within a specific area of the ocean based on fishing area or home port.

Many other variations and combinations of access privileges are possible. Many, perhaps all, of them can be implemented under the amended MSA.

Limited access programs can provide substantial benefits in addition to ending the race for fish. Consumers benefit because fresh, rather than frozen, fish are available for most of the year. Many believe that these programs will enhance safety because fishermen will no longer have to go out in bad weather and the Coast Guard will not be overwhelmed by thousands of fishermen operating in small areas or during a compressed season. Fishermen can develop better long-range business plans because they can more accurately anticipate their annual catch and are less likely to over-invest in boats and gear. They can also fish more carefully, minimizing gear loss and bycatch of protected and other non-targeted species. Finally, these programs allow fishermen and managers to work cooperatively.

But limited access regimes are not without potential difficulties, most of which have to do with the potential reorganization of the fishery and its participants. The age old statement is that the problem with fisheries is that there are too many people chasing too few fish. LAPs have the potential to correct this problem. However, changing the “too many people” to the presumably “just the right number of people” is a very difficult question. And in many instances, Councils are not just concerned about the number of actual fishermen, they are concerned with the distribution of the harvesting privileges across ports and fleets and the effect that various distributions will have on other aspects of the fisheries related industries such as boat builders and processors. The guidelines will discuss ways in which LAPs can be developed so as to address such issues.

As a sidelight, it is interesting to note that as the number of ITQ programs were increasing, in a few cases, the “privilege” part of a limited access privilege program has been denominated in terms of inputs rather than outputs. The state of Florida has two individual transferable trap permit programs where a limited number of traps that can be traded among qualified participants. While at the surface it may appear that there is little difference between input and output based privileges, the former suffers from two potential weaknesses. First, there is a less than a direct relationship between input and outputs and so it may be harder to achieve the desired harvest level with input privileges. In addition, there will be incentives for participants to increase the amount of harvest that can be obtained from a given defined level of input usage. This again will have the dual drawback of weakening biological effectiveness and increasing the cost of producing fish.

In summary, overtime, the types of fisheries regulation in use has evolved from open access, where fishing is open to all, to limited access where fishing is limited to a specified group, to limited access privileges, where fishing is limited to a specified group each of which is given a specified amount of fish that may be harvested or a specified amount of effort that may be used. Understanding this evolution can be useful for practical fisheries management because it clarifies the purported management weaknesses that each step in the evolution was designed to correct. It should be emphasized that the discussion is not meant to imply this evolution is a natural thing that will or should occur in all fisheries. The type of program that will be best for a particular fishery is a policy choice that should be based on the different characteristics of the fishery and the objectives of management. One choice will be whether to have a limited access privilege program or not. However, that choice can not really be made in isolation. It is first necessary to determine what type of LAP to use. Again, the purpose of this document is to provide assistance in designing the best possible privilege program for a particular fishery.

A Short Note on the Theory of Market Based Management Techniques.

From an economic theory point of view, the major source of the overfishing problem is the lack of property rights. This is the main point of Garrett Hardin’s seminal article “The Tragedy of the Commons”(Hardin, 1968) Since no one can own a fish until it is caught and put in the boat, there are no incentives to conserve the stock. Postponing harvest may make economic sense in terms of being able to take a larger more valuable catch later. In addition allowing the fish the opportunity to spawn before being harvested may provide for even larger catches in the more distant future. From a private individual point of view, the postponement will not make sense unless the individual who foregoes the harvest is guaranteed the right to the increases in future harvests. However, with no property rights to fish, or a program with analogous characteristics, there can be no such guarantee. As a simple counter example, no one is worried about the over exploitation of cattle. If the owner postpones harvest, he or she is guaranteed the benefits of doing so.

Look at the case of property rights in cattle in a little more detail. What exactly does that mean? First it means that no one, including the government, can take them away without

compensation. It also means that the individual can buy or sell cattle so as to achieve the proper balance between the number of cattle and the productivity of its pastures. It also means that the owner can choose what to do with the cattle. Should they be kept for breeding purposes or for milk production or should they be slaughtered for meat? It also means that if the inadvertent or deliberate act of another kills or lowers that value of the cattle, the owner can sue for compensation.

With all of these rights, there are incentives for private owners to utilize cattle so as to maximize the economic value from their use because they will receive all of the gains. If the economic returns are higher from breeding the cattle, the owner will be motivated to keep them around. If the returns for slaughtering depend upon the throughput of the feedlots each year, there will be incentives to develop procedures that maximize profits by considering the choice and costs of input and timing of production.

The basics of what are now called privilege-based management were derived from the notion of trying to simulate *some* of the aspects of property rights that work so well with cattle. Without going into all of the details, it has not been possible to mimic all of these attributes. Partially this is due to technical reasons. Fish move around over wide spaces and it is not possible to identify and assign individual fish to individual owners. Similarly, it is not possible to keep track of which fish are the offspring of which parents. There are also some legal and political constraints. The MSA is very clear that any LAP is a permit to harvest and does not confer any right to compensation and that there are no rights, title, or interest in any fish until it is harvested. Basically what this means is that if a Council creates an LAP program, but then decides to replace it with another type of regulation, the owners of the LAP permits would not be entitled to compensation. Likewise, if an oil spill kills some of the fish that could have been captured using the permit, the owner of the permit can not sue the person who caused the spill for damages.

The privileges to fish under LAP programs are clearly different and weaker than those that would apply to property rights to cattle. At the same time however, there are many other aspects of property rights that can apply to LAPs. And the important thing here is that carefully crafted LAP programs can create privileges with sufficiently analogous characteristics to those provided by traditional property rights such that they create many of the same positive incentives. Such things as transferability, program duration, eligibility to own, and other aspects of LAP programs will affect, for good or ill, the incentives of participants. These issues will be discussed in greater detail below.

The Process of Designing a LAP program.

The *basic* process of developing a Fishery Management Plan that implements a LAP program should be no different than the process of developing any other FMP. All plans should be developed following the current version of the Operational Guidelines for the Development and Implementation of Fishery Management Plans. (Provide current reference) The Councils should undertake the required steps of scoping, planning, preparation of documents, public review, and adoption regardless of the type of management regime. Granted there may be special requirements, such as referenda in

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some cases, but the process of designing the fishery regulation program should be the same.

While the process will not be different, the types and amounts of work done at each step will vary, especially when a Council is preparing a LAP program for the first time. This can be discussed in terms of the following generalized steps for the plan development process.

1. *Current Status Description.* Summarize the current status of the fishery including stock characteristics, existing management regulations, catch trends, fleet size, cost, earnings, and employment levels of the various sectors including the processing and support industries. If applicable, descriptions of the recreational sector should be provided including participation and catch rates and any valuation information. All of this should be placed in context by describing the physical and natural environment including ecosystem interrelationships and community structures. The discussion should focus on identifying potential areas of concern with respect to the stock or to participants.
2. *Set Objectives.* State the Fishery Management Objectives or Goals that the Council wishes to achieve with the FMP. Often the goals have to do with correcting or mitigating one or more of the problems identified in step 1. The objectives will be most useful if they are stated such that it is possible to measure the degree to which they are achieved.
3. *Specify Management Alternatives.* List the range of management options that will (or can) be considered to achieve the management objectives. Often the list will be expanded or the nature of specific alternatives will be modified during the performance of steps 4 and 5.
4. *Analyze Alternatives.* Using the best analytical tools available, determine the effects of the various management alternatives on the stock and the welfare of stakeholders measured in ways that relate to the management objectives.
5. *Select and Implement the Best Option.* Select the management option that most nearly achieves the management objectives while meeting the other requirement of the MSA.
6. *Monitor and Adjust.* Develop a monitoring protocol that can determine if the selected management option is producing the desired results.

When performing these steps it is necessary to directly consider the transition phase between the status quo and the operation of the fishery after it has adjusted to the new fisheries management structure. As with any change in a management plan, the switch to a LAP program can have far reaching effects. While there is the potential for biological, financial, and efficiency improvements, in the process there will be both real and perceived winners and losers. Some of the problems result because it takes time to learn how to operate under a new system and some from the fundamental changes in the rules of the game. It is possible that many of them can be reduced if in the process of

designing a LAP program, the path to the new regime is as much a part of the planning as is the final destination.

This means that the management objectives should address biological, distributional, and other goals during the transition phase. The range of management alternatives should be broad enough to provide a meaningful choice between effects during the transition as well as after program implementation. In reality this may involve minor modifications, including time specified adjustments, in the options discussed below. For example, because it will likely take time for participants to learn how to operate in a market-based system, it may make sense to prohibit transferability in the first year or to only allow for short term transfers in the next two years, before allowing for full transferability in the fourth year. This is discussed in more detail in the section on transferability below. Further, when the goal is to correct for fleet overcapacity, a LAP program may include phased reductions in fleet and labor force. Further, a loan program may be set up as part of the cost recovery process to help certain individuals purchase harvesting privileges.

Just as important, when the different alternatives are analyzed, the stock and welfare effects during the transition should also be clearly laid out for participants and Council members to review.

The actual design of a potential LAP program should occur during step 3. However the basis for deciding if one is necessary, and if so, how it should be designed, should be provided in steps 1 and 2. LAPs have the potential to eliminate the race for fish (caused by simple input or output controls) and the deleterious effects the race can have on fleet and processing capacity, product quality, and safety. They provide incentives to reduce overcapacity and to improve product quality. A careful study of the current state of the fishery will make it possible to determine if a LAP program will be a suitable management option to address the issues of concern.

However, there are many ways to design a LAP program and to design the best one for the given situation, it is necessary to have criteria for selecting which options to use. The management objectives selected in step 2 will be those criteria. To be useful, the objectives or goals should address biological, economic, social, cultural, and distributional issues.

If, based on the results of steps 1 and 2, the Council decides to consider a LAP program, the work will take place in step 3. The task will be to design the specifics of the program such that it achieves the management objectives while conforming to the MSA and other applicable laws. Implicit in this is that the LAP program will be an improvement over the status quo regulation program.

While the Devil is in the details and these details will be explained further below, there are two basic things that must be done when designing a LAP program: (1) Determine who will receive and who can hold the harvest privileges; and (2) Define the nature of the harvesting privilege. In programs designed under previous versions of the MSA, the privileges were called Individual Fishing Quotas (IFQs) and they were given to “persons”

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in the broad legal sense, but primarily to individuals and firms. IFQs may still be used by Councils, and they are defined as:

The term "individual fishing quota" means a Federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by a person. Such term does not include community development quotas as described in section 305(i). [Insert proper citation]

The reauthorized MSA follows the lead of the US Ocean Commission and broadens the scope of harvesting privileges by introducing the concept of Limited Access Privileges, LAPs, which can be given to regional fishery associations (RFAs) and fishing communities (FCs), which are defined in the act and will be discussed in detail below. A LAP is defined as follows:

The term "limited access privilege (A) means a Federal permit, issued as part of a limited access system under section 303A to harvest a quantity of fish expressed by a unit or units representing a portion of the total allowable catch of the fishery that may be received or held for exclusive use by a person; and (B) includes an individual fishing quota; but (C) does not include community development quotas as described in section 305(i). [Insert proper citation]

As defined, IFQs are a subset of LAPs, but, quite frankly, it is hard to distinguish between the two. IFQs represent a quantity of catch expressed as a *percentage* of the TAC, while LAPs are expressed as a *portion* of the TAC. It is not absolutely clear what is the distinction between the two terms. In both cases the amount of fish that can be harvested by the privilege holders in any year is bounded by the TAC, but presumably LAPs provide a little more latitude in the way the TAC is divided. With IFQs, the quota shares are always granted as a percent of the TAC, but with LAPs, the quota shares may be given in terms of weight but will require adjustments with changes in the TAC. (This issue is described in detail in the section entitled Denomination of the LAP unit.)

Further both can be received or held by a person, where person is defined in the Act as:

The term "person" means any individual (whether or not a citizen or national of the United States), any corporation, partnership, association, or other entity (whether or not organized or existing under the laws of any State), and any Federal, State, local, or foreign government or any entity of any such government. [Insert proper citation]

Given that IFQs, the term of choice under the previous legislation, is now subsumed under the term LAP, and further given the very small difference between the two, when discussing market-based management programs under the new legislation, it makes sense to use the term LAPs. The only time there is a need to make a distinction is with respect to the way the TAC is divided. An IFQ represents a LAP where the "portion of the TAC" is a percentage.

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For purpose of discussion it will be useful to specify the range of choice open to the Councils when creating a LAP program under the revised MSA, relative to what could be done under the previous legislation. The range of choice is shown in Figure 1. Most Councils are familiar the development of IFQ programs, which is shown in the left hand box. The right hand box shows the use of only the new elements in the Act. In between is the wide range of combinations of the old and the new. In many important ways, granting LAPs to RFAs or RCs will have little effect on the design of a program relative to the design of an IFQ program. In other ways, there are some important differences to consider, especially in combined cases where there are significant differences in the nature of the recipients. The discussion to follow will focus on these similarities and differences.

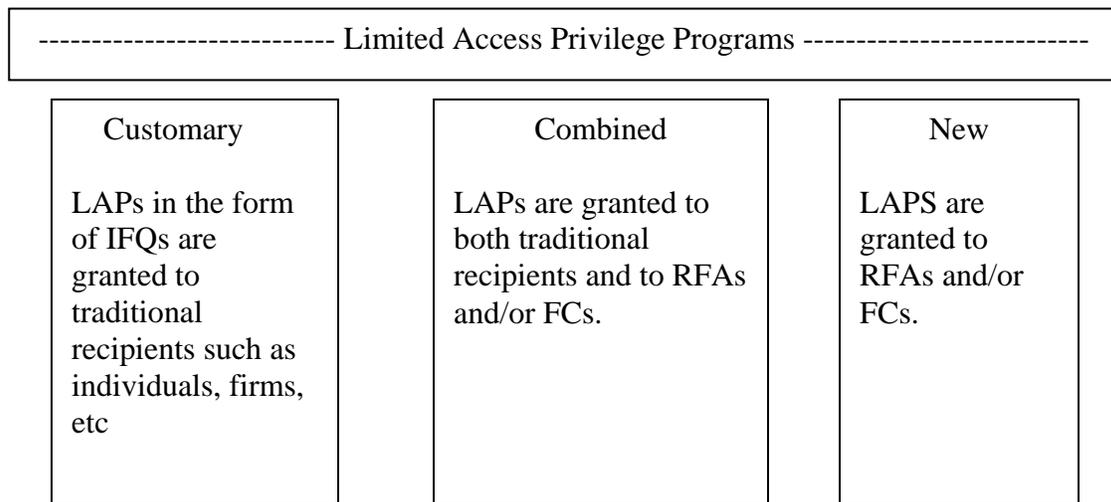


Figure 1

The second design issue is to specify the nature of the privileges. The components that, in concert, specify this nature include specification of management or resource units, denomination of LAP units, eligibility to own, program duration, transferability, and excessive share. One of the fundamental goals of these guidelines is to assist Councils as they evaluate each of these components. This is accomplished by describing the nature of each component and providing a summary of the pros and cons of the different options that can be used in their design.

Before going into the details of the development of a LAP program, it will be useful to review the more general requirements for LAPs that are spelled out in the MSA. The following is taken verbatim from the act. (Supply reference) These are the mandates for LAPs. Most are self-explanatory. Note that steps 2 and 6 of the generalized plan development process described above are mandated. Note also that most of these provisions will be at least partially the responsibility of NMFS.

In addition to complying with the other requirements of this Act, any limited access privilege program to harvest fish submitted by a Council or approved by the Secretary under this section shall:

- (A) if established in a fishery that is overfished or subject to a rebuilding plan, assist in its rebuilding; and
- (B) if established in a fishery that is determined by the Secretary or the Council to have over-capacity, contribute to reducing capacity;
- (C) promote
 - (i) the safety of human life at sea; and
 - (ii) the conservation and management of the fishery;
- (D) prohibit any person other than a United States citizen, a corporation, partnership, or other entity established under the laws of the United States or any State, or a permanent resident alien, that meets the eligibility and participation requirements established in the program from acquiring a privilege to harvest fish;
- (E) require that all fish harvested under a limited access privilege program be processed by vessels of the United States, in United States waters, or on United States soil (including any territory of the United States). *(The Secretary may waive the requirement of paragraph (1)(E) if the Secretary determines that (A) the fishery has historically processed the fish outside of the United States; and (B) the United States has a seafood safety equivalency agreement with the country where processing will occur (or other assurance that seafood safety procedures to be used in such processing are equivalent or superior to the applicable United States seafood safety standards).* Place citation as to where this came from.
- (F) specify the goals of the program;
- (G) include provisions for the regular monitoring and review by the Council and the Secretary of the operations of the program, including determining progress in meeting the goals of the program and this Act, and any necessary modification of the program to meet those goals, with a formal and detailed review 5 years after the establishment of the program and every 5 years thereafter;
- (H) include an effective system for enforcement, monitoring, and management of the program, including the use of observers;
- (I) include an appeals process for administrative review of determinations with respect to the Secretary's decisions regarding administration of the limited access privilege program;
- (J) provide for the establishment by the Secretary, in consultation with the Department of Justice and the Federal Trade Commission, for an information collection and review process to provide any additional information needed by the Department of Justice and the Federal Trade Commission to determine whether any illegal acts of anti-competition, anti-trust, price collusion, or price fixing have occurred among regional fishery associations or persons receiving limited access privileges under the program; and
- (K) provide for the revocation by the Secretary of limited access privileges held by any person found to have violated the antitrust laws of the United States.

While, for the most part, these provisions are self-explanatory, it is possible to provide more details. First, a well thought-out LAP program should easily be in compliance with points (A), (B), and (C). A TAC that conforms with other parts of the MSA will ensure that there are no problems with overfishing. Similarly, with reasonable rules on transferability, the incentives for efficiency in production produced by a LAP program will contribute to the reduction of over-capacity. Finally, the potential freedom given to participants to fish where and when they choose will contribute to safety at sea and the improvement of overall management and conservation.

Section (D) places legislative constraints on how Councils choose to address the “eligibility to own” component of a LAP program. This is discussed in more detail in the relevant section below.

Section (E) ensures that all fish harvested in LAP fisheries will, with certain specified exceptions, be processed by US processors presumably to prevent a system that will allow certain segments of the industry to be blocked from the gains of a LAP fishery.

Sections (F) and (G) are merely the codification of Steps 2 and 6 in the generalized plan development process described above. Both should be part of the current development and updating procedure for all plans, although the mandated written report is rarely done. The purpose of the report is to provide a formal analysis of how well the plan objectives have been achieved and of how well the fishery is operating overall. To ensure that the report can be completed, it is imperative that the relevant data on metrics related to the meeting of the objectives are collected in a regular and organized manner.

Sections (H) and (I) are also legislative mandates for procedures that are routinely performed as part of the preparation of all management plans. The NMFS has programs for enforcement and appeal for all existing management plans. Although LAP programs are different, the changes required with respect to enforcement and appeals should be straightforward, and will, for the most part, be the responsibility of NMFS and not the Councils.

Section (J) and (K) provide a legislative mandate to prevent monopolistic activities that is directed at the Secretary and NMFS. Presumably, other than providing a statement in the plan that the mandated issues are to be addressed by the Secretary, there is little that Councils can do. As such, except for the section of excessive shares, these guidelines will not address this topic *per se*.

PART 2: The Guidelines

1. Nature of Harvest Privilege

A. Specification of the Management or Resource Units

Defining the management unit or units is an important part of any fisheries regulation program. This is no less true with a LAP program. A LAP management unit is the species, stock, or aggregation for which a TAC is specified and for which harvesting privileges are distributed. In the Surf Clam and Ocean Quahog ITQ program, there are only two units: Surf Clams throughout their range and Quahogs throughout their range. The ITQ program for Alaskan Sablefish and Halibut has many management units. Each stock is broken down into several units defined by geographic areas and a separate set of harvesting privileges is issued for each unit. The purpose was to customize the IFQ program so as to achieve certain fishery management objectives. See the “eligibility to own” section below. In some cases, it may be necessary to design a LAP program with some management units for which harvesting privileges will not be distributed. This will be discussed in more detail at the conclusion of this section.

Selecting the LAP management units for a LAP program is a very important step. In the first place, it defines what stocks, or parts or aggregations thereof, will be the basis for the harvesting privileges. And critically important, it is also the biological foundation for ensuring proper conservation. In this latter regard, there are two types of questions pertaining to the selection and definition of the LAP management units that must be answered.

The first question is: How many species should be included in the program? If different species are biologically or commercially related, there may be grounds for managing them jointly under the LAP program. Some of the considerations that need to be addressed are: 1. Are the species caught as a by-catch or a directed catch with the same gear or by the same fleet? 2. Are there predator-prey or other ecological relationships between the species?

Care must be taken when selecting the stocks. There are two types of errors that can be made. An error of exclusion occurs when a species that is closely related to those in the program is left out. This can make it difficult to appropriately manage the species that are in the program and/or the one that is left out. For example, if the catch of a species which is not covered in a program has a significant by-catch of a species which is

LAP Spotlight #1: Individual Fishing Quota Halibut and Sablefish Program
<http://www.fakr.noaa.gov/ram/ifq.htm>

Vital Stats

First year: 1995.
Type of DAP: IFQ and also a CDQ for Halibut.
Management units: Multiple area and vessel categories for sablefish and halibut.
Vessels / Gear types: Longline catcher and freezer/processor vessels. Also traps for sablefish.

Available Trend Data

Season length: Less than a week pre-IFQ to more than 8 months recently.
Ex-vessel value: 1994 ~ \$150M; 2005 ~ \$236M.
Consolidation: 33% and 17% reduction in individual halibut and sablefish permit holders respectively, 1994-2005.
Stock status: 1998 and 2005 exploitable biomass estimates within 4%.
Currently - Overfishing: NO; Overfished: NO

Nature of Harvest Privilege

Eligibility: US Citizens who were given initial quota share or US Citizens who can document 150+ days experience harvesting fish in any U.S. fishery.
Duration: Open ended. Council can end the program through the normal Council process.
Transferability: Quota share is transferable subject to eligibility and accumulation limits designed to maintain the character of the fishery. Leasing is very restricted.
Accumulation: Unless grandfathered based on original landings history, no one can hold or control more than 0.5%-1.5% of the halibut or sablefish shares by area (Gulf of Alaska, Bering Sea, and Aleutians). There are similar restrictions on the amounts that can be used on any single vessel.
Initial Allocation: Quota issued to owners or leaseholders of vessels that had landings at any time in 1988-1990. Best five years of catches from 1985-1990 for sablefish and 1984-1990 for halibut were used to calculate quota shares.

Management

Identified Costs: In 2005, ~\$1.3 million for administration and ~\$2.4 million for enforcement with 75% paid for with cost recovery.
Cost recovery: Cost recovery fee was 1.6% of the ex-vessel value of the fishery in 2005, of which 25% of collected fees are reserved for loan programs (programs reimbursed with the other 75%). Other years: 1.3% (2004); 1.4% (2003); 2% (2002); 2% (2001); 1.8% (2000).
Monitoring: Each landing is reported electronically in real time by Registered Buyers (RBs). During 2002, NMFS conducted 295 dockside boardings (18% of vessels). The Coast Guard conducted 181 at-sea boardings, monitored 102 IFQ offloads, and spent more than 2,100 person-hours on after-hours surveillance. These activities resulted in the detection of 26 fisheries violations, mostly related to log books, permits not on board, and exceeding bycatch limits greater than 10 percent.
Special Insights: CDQ implemented to address affected western Alaskan communities. Anecdotal reports of lost jobs due to consolidation. Switch from need for crews for a brief season to need for near year-long crews. Processors affected by lack of need for brief, high volume processing and ability of boats to travel further given lack of time pressure in IFQ fishery.

included, it may be quite difficult to account for by-catch mortality. There are many examples of fisheries where these issues are relevant including New England and Alaska Groundfish, and Gulf of Mexico reef fish. Discussion of details that need to be addressed and ways of doing so are provided in the documentation of the Trawl Individual Quota program of the Pacific Council [add reference].

On the other hand an error of inclusion occurs when a minor or unrelated species is included in the program. Determining and enforcing the TAC for such a species can involve more work and managerial repercussions on the major species than the gains from managing the minor stock are worth.

The second question is: How should each of the included species be classified? There may be several stocks or geographically distinct units of the same species. If so it may be appropriate to have a separate TAC for each. At the other extreme, there may be certain groups which may be treated as aggregations for management purposes even though they are technically made up of separate species. Rockfish in Alaska may be a good example. These aggregations can have a joint TAC. But all fisheries aggregations don't necessarily require a TAC unless there is evidence that one or more of the minor stocks is being overfished.

Here again the decisions are critical. An error of conglomeration can occur if biologically distinct stocks are not separated. A single overall TAC on two separate stocks may put too much pressure on one stock if it is closer to port or has a higher catch per unit of effort. On the other hand, an error of specificity may occur if the different species are divided into too many stocks because the program can become unwieldy and difficult to manage. This is a potential problem in customizing a program to divide the harvesting privileges among different groups or areas.

There are definitely trade-offs in answering these two questions. The larger the number of stocks that are included in the program, the more inclusive the system will be and the lower will be the need for a separate management program to handle species and stocks not included. And, the more finely the quota share stocks are geographically defined, the easier it will be to focus management on more narrowly defined species or species groups if there are biological, technological, or distributional reasons for doing so. However, the larger the number of area divisions, the more complex and difficult it will be to manage the LAP program. There will be more TACs to set, and the monitoring program will have to be able to distinguish landings according to the stock from which they were harvested.

As mentioned above, in some cases it may be necessary to include certain species in the overall FMP that will not be an explicit part of the LAP program. For example, there may be a bycatch relationship with an ecologically sensitive species that has little or no market value. It would make sense to include the species in the management plan so that fishing mortality issues could be legally addressed. In some cases it may make sense to do so in ways that are independent of the LAP program such as specifying direct by-catch controls or trip limits. However, even in these cases, it may be useful to consider the use of by-catch LAPs. If the by-catch ratios vary across users or harvest techniques, and the target bycatch harvest level can place a constraint on directed harvest, a program that includes by-catch harvest privileges and directed catch harvest privileges will provide incentives for maximizing the level of directed catch per unit by-catch.

B. Denomination of LAP Units

A LAP program requires the division of the TAC into smaller “portions” that can be distributed to selected participants. Since the TAC can vary over time due to variation in the status of the fish stock, a mechanism is needed to vary the individual shares as the TAC changes. As mentioned above, there are two types of LAPs authorized under the revised MSA. With an IFQ, the basic entitlement is specified as a percentage of the TAC. For example, if a fisherman holds an IFQ share equal to one-tenth of one percent of the TAC, and the TAC is set at 15,000 metric tons for the year, then the fisherman has the right to catch up to 15 metric tons during the year. Let the term quota share (QS) refer to the basic entitlement, which are denominated in terms of a percentage of the TAC. Further let the term annual harvest privilege (AHP) refer to the periodic harvest privileges, which are denominated in terms of units of catch. The system as a whole can be called a QS/AHP program.²

The arguments in favor of using a percentage system is that it takes into account the biological uncertainty that is inherent in fisheries utilization and at the same time is easy and straight-forward to administer. Further it does so in a way that puts the risk on the quota recipients. Given the vagaries of Mother Nature, Councils can not realistically guarantee participants a specified harvest year after year. The recipients, who must be current participants in the fishery, will be used to operating in an uncertain environment, and should be able to design general operating plans to take into account expected changes in the TAC. Further if a LAP program is instituted in a fishery with an overfished stock, the initial AHPs may be substantially less than historic catches. One could argue that since they are the ones who will bear the costs of the necessary restrictions in harvest, they deserve to receive the benefits when the stocks recover.

When using the more general notion of a LAP, it is only necessary to specify the privileges as a portion of a TAC. If this is to be a meaningful distinction, then the portion must be something other than a percentage. The most obvious choice would be to express the harvest privilege in terms of a fixed quantity of fish with the *proviso* that the total amount of privileges in any year can not be higher than the annual TAC. This can be called a fixed annual harvest privilege (FAHP) system. However, for the system to work there must be a procedure to change the “fixed” shares when there is a change in the TAC. That is, it will be possible to allocate extra privileges in the happy times when the TAC increases and is greater than the sum of the allocated harvest privileges. However, it will also be necessary to take privileges from existing participants in those unfortunate years when the TAC is less than the sum of the currently allocated harvest privileges. These are not completely analogous situations. In the first case, it is *possible* but not necessary to allocate the extra privileges and the potential set of possible recipients is very large. On the other hand, in the later case, to maintain the health of the stock, it is *necessary* to take privileges and the set of those who can be forced to give privileges back is *limited* to those who have them.

² There are many different terms for the annual privileges in use in various regions: annual IFQ in Alaska, quota pounds in the Northwest, and IFQ allocation in the Gulf. The general term annual harvest privilege is meant to include all of them.

The next issue is how the changes in outstanding privileges will be made. For historical purposes, it should be noted that a theoretical option is to buy them from existing participants when the TAC falls and to sell them to willing buyers when the TAC goes up. In essence, by guaranteeing that privilege holders will be compensated when the TAC falls, the management system is bearing the inherent risk of fisheries utilization. This is what New Zealand tried to do when it first implemented its ITQ program. However, the program failed because the government did not want to come up with the extra money to buy back the necessary quota. This option would likely not be permitted under the MSA because of the lack of specific authorization to buy privileges back. It should also be noted that even if the TAC is normally distributed around some average value which is used as the basis for the initial allocation, the government will likely lose money as it buys and sells the changes in allowable catch. When it is buying, it will be moving up the demand curve because the amount of fish on the market will decrease, however when it is selling it will be moving down the demand curve because the amount of fish will increase. Therefore it will be buying catch privileges back at higher prices than it will be selling them.

The most obvious option to keep harvest privileges within the TAC with a fully allocated FAHP system is to give or take away the necessary amounts of harvest privileges as the TAC changes instead of buying or selling them. This will require a set of rules for making such determinations. At one extreme the giving and taking could be a simple percentage increase or decrease which would make this system the same as the QS/AHP IFQ system. The range of other possible rules or procedures is almost infinite. The issue is something like the problem of determining the initial allocation, except that it will be necessary to make periodic allocations *and retrievals* in perpetuity. See the discussion of initial allocation. It must be said at this point however that, to be blunt, the conventional wisdom from the use of market-based management programs around the world is that a FAHP system, with either a buy and sell option, or a give and take option, is not a good idea.

Another option could be called a cushion FAHP program. Under such a system, the Councils could put a cushion between the average expected TAC and the amount of fixed allocations. For example they could only allocate 80% of the average TAC, leaving the rest to be auctioned off or to be harvested in a regulated open access fishery. The actual percentage chosen would be a level below which the actual TAC is not expected to fall. The amount made available for auction or other use would go up or down depending on the variability of the TAC, but only in rare occasions would the amount available to privilege owners have to be reduced.

LAP Spotlight #2: Western Alaska Community Development Quota (CDQ) Program
<http://www.fakr.noaa.gov/ram/ifq.htm>

Vital Stats

First year: 1992.
Type of DAP: CDQ for Groundfish, Halibut, Crab, and Prohibited Species.
Management units: Six locality-based CDQ managing entities (CDQ Groups).
Vessels / Gear types: Many smaller vessels, many gear types.

Available Trend Data

Season length: Varies by species.
Ex-vessel value: 2005 ~ \$65M
Consolidation: NA
Stock status: Varies by stock.

Nature of Harvest Privilege

Eligibility: The Western Alaska Community Development Quota (CDQ) Program allocates a percentage of all Bering Sea and Aleutian Islands quotas for groundfish, prohibited species, halibut, and crab to eligible communities. The purpose of the CDQ Program is to provide the means for starting or supporting commercial fisheries business activities that will result in an ongoing, regionally based, fisheries-related economy in Western Alaska.

Duration: Open ended. Council can end the program through the normal Council process.

Transferability: NA

Accumulation: NA

Initial Allocation: Allocations for the CDQ program are by regulation. Within the CDQ program and through 2006 by regulation, allocations are competitive on a three-year cycle, with applications reviewed by the State of Alaska and North Pacific Fisheries Management Council as well as NMFS.

Management

Identified Costs: 2007 estimated costs are \$0.664M w/o cost recovery

Cost recovery: NA.. A cost recovery program is being considered.

Monitoring: For CDQ halibut account management and crab fisheries, each landing is reported electronically, in real time, by Registered Buyers (RBs) or Registered Crab Receivers, respectively. For other species, weekly CDQ reports are submitted by CDQ group managers.

Special Insights:

If the cushion is to be auctioned off, the point of the discussion changes in a significant way. The issue really becomes the ability to collect some of the rent from the fishery rather than of the denomination of the harvest privilege. This is so because it is possible to use a cushion QS/AHP program, which would work in an analogous manner. The cushion amounts could be auctioned off and in those rare years where the allocated privileges have to be reduced, it would be done on a percentage basis. This subject is treated in more detail in the section on auctions.

The disadvantages of allowing the cushion to be fished in a regulated open access fishery are very large however. Anytime a management system uses two different types of

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controls simultaneously, there is bound to be an increase in administrative cost and detail. In addition, both the biological integrity of a firm TAC and the efficiency and capacity reducing incentives of a privilege based system for the entire fishery would be lost.

To summarize the discussion thus far, there are two related policy issues involved. First, who should bear the inherent risk and the associated costs and benefits that are associated with changes in the TAC? Should it be the participant who must deal with uncertainty in planning fishing activities? Or should it be the management authority that has to develop and follow adjustment protocols? The related question has to do with the difference between using formulas and using policy discretion. A percentage formula is easy to use, transparent and free of the taint of backroom bargaining, but the gains and losses are proportionate to QS holdings. However, some may feel that management objectives can be better met if decisions on the allocation of decreases, and especially significant increases, in the TAC are subject to Council deliberations.

For reasons discussed above, while auctions can be used to handle the variability of TACs, it is likely that the issues with respect to rent collection can be most clearly enunciated if that problem is addressed independently, rather than as a sub-point in discussions of denominations of harvest privileges.

As a final point, it is important to note that whichever system is used, the actual annual harvesting privilege will be denominated in terms of catch weight. It may seem like a small point, but it is also necessary to specify whether the denomination will be in terms of the live weight of fish put on the deck, or the landed or first sale weight after heading and gutting. It will be important to ensure that the one that is used is consistent with the denomination used in stock assessment analysis. Also if catch is sometimes landed in green weight and sometimes with some processing, it will be necessary to establish a conversion coefficient so that the different types of landings can be compared. This can be a difficult problem because the relationship between green weight and landed weight can vary depending upon the season and the type of fish cleaning technology or procedure is used. And errors in conversion can create problems with respect to keeping the fishery below the TAC and in ensuring that individual participants take no more or no less than they are entitled to.

C. Eligibility to Own

The issue here is the selection of the individuals or entities that are allowed to participate in a LAP program. It is related to the initial allocation issue because those who are chosen to be part of the initial program must be eligible to own harvest privileges. (Remember ownership refers the access privileges not to the fish per se.) However, all parties that are eligible to own may not necessarily receive privileges during the initial allocation. It is also related to the transferability issue. If the set of parties that are eligible to own subsumes the set included in the initial allocation, transferability must be possible if all in the larger set are to have access to privileges.

As with other components of the nature of the harvest privilege, the eligibility to own criteria should be selected according to the goals and management objectives of the FMP as constrained by the MSA. To set the stage, at one end of the widest possible continuum is to allow any person or entity to own harvest privileges. If they can own a car, they can own privileges. This is not allowed under the MSA. At the other extreme, ownership can be restricted along a number of margins. For example, only licensed fishermen and certified boat owners who have participated in the fishery for X years using an owner operated boat outfitted with Y gear, and fishing out of Z port are eligible. Moving from broader to more restrictive criteria may help achieve certain management objectives but it can also limit the potential benefits provided by an active market in the trading of privileges. In addition, such moves may affect implementation, operation and monitoring costs. These are the types of trade-offs that Councils will have to consider.

The MSA does put some constraints on what the Councils can choose to do. In the first place it states that:

(The Council shall) authorize limited access privileges to harvest fish to be held, acquired, or used by or issued under the system to persons who substantially participate in the fishery, as specified by the Council. (Change if necessary and place proper citation after final passage of MS reauthorization.)

Elsewhere in the Act, a “person” is defined as follows.

The term "person" means any individual (whether or not a citizen or national of the United States), any corporation, partnership, association, or other entity (whether or not organized or existing under the laws of any State), and any Federal, State, local, or foreign government or any entity of any such government.

Before interpreting this however, it is necessary to note a second direct reference to “eligibility to own” which is contained in the Act.

a limited access privilege program ... shall prohibit any person other than a United States citizen, a corporation, partnership, or other entity established under the laws of the United States or any State, or a permanent alien, that meets eligibility and participation requirements established in the program from acquiring a privilege to harvest fish. (Change if necessary and place proper citation after final passage of MS reauthorization.)

Since Councils must prohibit any person other than those listed, in plain language this means that only those on the list may be granted LAPs. Therefore the range of applicable “persons” that may own or control harvesting privileges is more circumscribed than the general definition of a “person”. For example, non-citizens, other than permanent aliens, and non-US entities may not own harvest privileges.

This grants the Councils wide latitude in determining who may or may not acquire harvesting privileges. However, it is not as wide as the “anybody can own” criteria

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mentioned in the introductory discussion above, because of the citizenship requirements and the “substantially participate in the fishery” clause. It is the responsibility of the Council to determine what “substantially participate” actually means based on the fishery management objectives. In addition to vessel owners, who have been recipients in previous IFQ fisheries, presumably recipients could include captains, crew members, processors or participants in fishery dependent support businesses. At the same time, the Council, to meet management objectives, can prohibit certain citizens, permanent aliens, and US entities from owning harvest privileges by specifying eligibility and participation requirements in the FMP. It is interesting to note that there are no specific restrictions in the law on non-US citizens participating through ownership of, or membership in, one of the permitted entities. Presumably this could be addressed independently by the Council.

The reauthorized MSA explicitly allows Councils to permit harvesting privileges to be held by two new types of entities: Fishing Communities (FCs) and Regional Fishery Associations (RFAs). Fishing communities were defined in the previous Act as part of CDQ programs.

The term "fishing community" means a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community.

The concept of a Regional Fishery Association was introduced in the 2006 reauthorization.

The term ‘regional fishery association’ means an association formed for the mutual benefit of members (A) to meet social and economic needs in a region or subregion; and (B) comprised of persons engaging in the harvest or processing of fishery resources in that specific region or subregion or who otherwise own or operate businesses substantially dependent upon a fishery.

If Councils are to use either of these two new options in a LAP program, they must specify criteria that, in addition to conditions set out in the Act, are to be used to officially designate organizations as RFAs or FCs for purposes of the Act. Presumably the designation will be an official Council process carried out under the authority of an approved LAP FMP.

According to the Act, the eligibility requirements for FCs are that they must:

1. Be located within the management area of the relevant Council;
2. Meet criteria developed by the relevant Council, approved by the Secretary, and published in the Federal Register;

3. Consist of residents who conduct commercial or recreational fishing³, processing, or fishery-dependent support businesses within the Council's management area;
4. Develop and submit a community sustainability plan to the Council and the Secretary that demonstrates how the plan will address the social and economic development needs of fishing communities, including those that have not historically had the resources to participate in the fishery, for approval based on criteria developed by the Council that have been approved by the Secretary and published in the Federal Register.

The eligibility requirements for Regional Fishery Associations (RFAs) are not quite the same. The first and second are identical but the remainder make for some striking differences between the two types of organizations.

3. Be a voluntary association with established by-laws and operating procedures.
4. Consist of participants in the fishery who hold quota share that are designated for use in the specific region or subregion covered by the regional fishery association, including commercial or recreational fishing, processing, fishery-dependent support businesses, and fishing communities;
5. Not be eligible to receive an initial allocation of a limited access privilege but may acquire such privileges after the initial allocation, and may hold the annual fishing privileges of any limited access privileges it holds or the annual fishing privileges that its members contribute.
6. Develop and submit a regional fishery association plan to the Council and the Secretary for approval based on criteria developed by the Council that have been approved by the Secretary and published in the Federal Register.

Given the differences, it appears that FCs must be actual communities which can be identified as a location on a map, and they may be selected out as a qualifying entity because they are in need of, or merit, regional economic development. On the other hand, RFAs are voluntary organizations that are not necessarily geographically specified. There is no reference to the need for regional economic development. Most important, RFAs can not receive LAPs as part of an initial allocation, but they can use those of its members, or may purchase them on the open markets as part of an ongoing LAP program.

The Councils must stipulate criteria that potential groups must meet to be classified as an FC or an RFA and hence be eligible to receive harvesting privileges. In developing the participation criteria for FCs, the Council is directed to consider:

1. Traditional fishing or processing practices in, and dependence on, the fishery;
2. The cultural and social framework relevant to the fishery;
3. Economic barriers to access to the fishery;

³ It is interesting to note that while recreational participants are not mentioned in the formal definitions of a FC and an RFA, they are included in the discussion of eligibility requirements.

4. The existence and severity of projected economic and social impacts associated with implementation of limited access privilege programs on harvesters, captains, crew, processors, and other businesses substantially dependent upon the fishery in the region or subregion;
5. The expected effectiveness, operational transparency, and equitability of the community sustainability plan; and
6. The potential for improving economic conditions in remote coastal communities lacking resources to participate in harvesting or processing activities in the fishery.

LAP Spotlight #3: Bering Sea & Aleutian Islands (BSAI) Pollock Cooperatives http://www.fakr.noaa.gov/sustainablefisheries/afa/afa_sf.htm	
Vital Stats	
First year:	1998.
Type of DAP:	Cooperatives.
Management units:	Bering Sea & Aleutian Islands Pollock.
Vessels / Gear types:	Vessel types: Catcher/Processor, Catcher, Motherships Gear types: Pelagic Trawl, Non-pelagic Trawl, Jig, Hook-and-Line, Pots
Available Trend Data	
Season length:	
Ex-vessel value:	
Consolidation:	In 2005, 15 CPs, 3 motherships and 70 CVs were active. Capacity reduction was not the intention of the AFA.
Stock status:	Currently - Overfishing: NO; Overfished: NO
Nature of Harvest Privilege	
Eligibility:	MARAD and U.S. Coast Guard regulations establishing 75% U.S. ownership requirements for fishing vessels over 100 ft LOA and under 100 ft LOA, respectively.
Duration:	Open ended. Council can end the program through the normal Council process. Annual Operations Plan must be approved by NMFS.
Transferability:	Not transferable except that catcher vessel cooperatives annual allocations depend on annual membership.
Accumulation:	At its October 2000 meeting in Sitka, Alaska, the Council considered the issues of BSAI Pollock excessive processing share limits and groundfish processing sideboard limits. The Council adopted a 30 percent excessive processing share limit for BSAI pollock that would be applied using the same 10 percent entity rules set out in the AFA to define AFA entities for the purpose of the 17.5 percent excessive harvesting share limit contained in the AFA.
Initial Allocation:	American Fisheries Act.
Management	
Identified Costs:	2007 estimated costs are \$0.216M w/o cost recovery.
Cost recovery:	None.
Monitoring:	A catch accounting system including real-time, electronic reporting and observer reporting components, is used to monitor allocations.
Special Insights:	

When developing participation criteria for RFAs, the list of things the Council is directed to consider is the same except that item 6 is omitted and the following phrase is added to

item 4: “upon the administrative and fiduciary soundness of the association and its by-laws.”

These criteria demonstrate again that assisting regional economic development can be used as a justification choosing to use FCs. In addition they clarify a potential underlying purpose for establishing either of the new entities. They may be used to mitigate any severe untoward effects of establishing a harvest privilege program. This likely refers to direct and indirect effects on fishery dependent business, community disruptions, and the notion that in a fishery with redundant vessels and processing plants, there can be serious distributional effect on processors if harvesting privileges are given only to vessel owners.

An important difference between FCs and RFAs is the ability of FCs to receive LAPs as part of the initial allocation. Operationally, this means the RFAs can not be formed until after initial allocation is complete and the LAP program is operational. Further RFAs will be organized from the bottom up. The Council will have to make provision for organizations to be designated as RFAs and specify the eligibility criteria, but the decision to form an organization and to apply for designation will be up to willing sub-groups of the existing participants in the fishery. They can be participants either through initial allocations or purchase of harvesting privileges.

While the Councils can presumably treat FCs the same way and let groups apply for designation on their own after the program is in operation, they may also include FCs in the initial allocation. This requires a different level of planning during the construction of the LAP FMP. There is even a minor chicken and egg problem. FCs can not be designated until the eligibility criteria have been designed, approved by the Secretary, and published in the Federal Register. This approval can likely be made concurrent with the approval of the overall FMP, but it may not be possible to get that approval prior to the approval of the FMP. Until the FCs have been designated, it is not possible to know for certain how much of the TAC should be allocated to the overall FC segment.

One way to envision the process is as follows. The Council decides that it wishes to design and to implement a LAP program. It determines whether it will use IFQs or the more general form of a LAP. It determines that it will allocate X% of the TAC to traditional types of recipients which will be allocated according to a specified eligibility criteria and an allocation formula or procedure. This is essentially what was done in the Halibut/Sablefish program. The remainder of the TAC will go to FCs that meet the specified eligibility criteria using another allocation procedure. These will have to be simultaneous decisions based on participant comments and staff analysis during the FMP development process. The whole procedure will be based on the best estimate of how many traditional recipients will meet their allocation criterion, and how many FCs will likely form and be capable of meeting the eligibility criteria. If the plan is approved, the various participants will be given time to show that they meet the appropriate criteria and then the allocations will be made.

In summary, it appears that the intent of Congress is that an FC can be designated as an entity that is entitled to receive harvesting privileges if those privileges would assist in regional economic development. In addition, that designation could be made if the way in which the privileges are used by the FC can ameliorate serious economic or social impacts that would likely occur if the privileges were only given to individuals. The latter reason is the only specific reason noted in the Act for which RFAs can be established. Presumably RFAs can also be used in other cases if the Council can demonstrate that their use will help achieve management objectives, especially those related to maintaining “traditional fishing or processing practices,” or the “cultural and social framework of the fishery,” or if they address “economic barriers to access to the fishery.”

At this point, it is worth recalling from the general specifications discussed above that Councils may grant privileges to any “entity established under the laws of the United States or any State”. A city or a town is an entity established under the laws of a State. Further some States may grant legal status to certain forms of fisheries organizations. This leads one to wonder if the same purposes for which FCs or RFAs can be developed can also be achieved by specifying that these types of entities are able to receive or own LAPs. This is especially true if the specifications are carefully crafted. Small fishing towns in need of economic development could receive privileges which could be used in approved ways by its citizens. Similarly organizations of industry participants, broadly or narrowly defined at the will of the Council, could be treated in a similar manner. If this is so, one could reasonably ask why go through all of the effort to allow for RFAs or FCs. Other than noting this possibility, the remainder of the discussion will focus on the potential use of FCs and RFAs.

Given the possibility of designating FCs and RFAs, the continuum of choice facing the Council is actually more complex than the one used to set the stage for discussion in the introductory paragraph, although the basic points from that discussion apply. Under the reauthorized MSA, the Councils have the ability to establish a harvesting privilege program following the IFQ model used under the previous versions of the law. But they have much more flexibility. For one thing, even under the IFQ model, the harvesting privileges can be given to a wider range of potential recipients. And, in addition, harvesting privileges can be made available to FCs and RFAs as well as to traditional recipients.

The choice between a traditional IFQ program and a more broadly defined LAP program is an important one that, in addition to the long term effects on the fishery, may well have serious implications for the complexity and cost of the plan development process. To be blunt, it would be quite difficult to give specific advice on the range of options that are available when using the expanded LAP program. This is uncharted territory. The eligibility and participation criteria spelled out in the Act are very general. FCs are likely intended to be cousins of CDQs, but given the lack of specificity it is doubtful that Congress was considering something quite so elaborate. Similarly RFAs may be related, conceptually at least, to Co-Ops on the West Coast or the cod hook sector in New England, but the analogy is far from perfect.

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The true range of potential options when using FCs and RFAs can not be known at this time. When faced with the opportunity to use them to address management objectives of specific fisheries, Councils will likely come up with some very innovative ideas. This is likely exactly what Congress intended. However, it goes without saying that the decision to go beyond the basic IFQ model should be a very deliberate one. For the most part, economic development, even in the most general sense, has not been considered as a management objective except in CDQ fisheries. However, given the option, some Councils may wish to rethink this issue. This will be discussed in further detail below.

The use of RFAs is somewhat different. How should a Council make the, at least partially simultaneous, decisions or whether or not to use an RFA, and if, what eligibility criteria should be established. On the one hand, they could adopt a process of thinking “outside the box.” Set the management objectives and design an RFA alternative *de novo* on the basis of these objectives. On the other hand, there may be advantages, at least for conceptualizing the problem, to take a marginal approach. For example, the one stipulated reason for establishing an RFA is to mitigate the untoward distributional or social effects of traditional IFQ programs. But it will not be possible to predict if such things will occur, to what extent and to whom until the various aspects the program have been selected and studied. Further, it may be possible to address potential untoward effects or certain management objectives by tweaking the IFQ system rather than initiating a more complex system.

Following this logic, if for nothing more than an aid in furthering the discussion, consider the issue of determining the eligibility to own criteria when the focus is on a program that exclusively grants IFQs to traditional recipients such as individuals or firms. At this point, the Council has the option of allowing for broad or restricted participation.

To be more specific, under an IFQ program, the range of choice open to the Council could include the following.

- o Allow any legal entity permitted by the Act the right to own privileges.
- o Allow only individuals or partnerships the right to own privileges but exclude corporations.
- o Establish other restrictions to ensure that only certain types of participants, or sub-groups thereof, are permitted to own privileges.

The use of the first option is constrained by “substantially participate” rule, but the Council may wish to define the term to provide for real and viable options for entry into the fishery. This option provides the most flexibility with respect to allowing changes in the fishery. As such it may be useful in potentially inducing long term economic efficiency in harvesting and processing.

The second option, which is included for illustrative purposes as one of range of possibilities between the first and third options, might be chosen because some think that preventing corporations from participating may help maintain industry and community structure. At the same time, the limited flexibility may prohibit owners of harvest

privileges the opportunity to organize their activities to their best advantage. Currently, many small “mama/papa” operations take advantage of the opportunities provided by incorporation. The point is that the pros and cons of any restrictions should be carefully considered. What may help one section of the industry may hurt another.

The third option can work at two levels. The Council may restrict the type of fishery participant to certain segments of the industry. For example, a Council may stipulate that only individuals in the harvesting sector would be allowed to own privileges, which would prohibit processors from owning privileges. It would also exclude members of unrelated professions who perceive the purchase of IFQ as an investment, or environmentalists who wish to restrict the activities of commercial fishermen. In addition, there may be tighter restrictions placed on the permitted groups. In the example where eligibility is restricted to the harvester sector, tighter restrictions might be used if there are concerns that harvest privileges will be removed from the control of regional fishermen by individuals from other areas. At one extreme, quota ownership may be restricted to vessel owners from a certain area that must be onboard during a fishing trip and in attendance during the off-loading period.

While the Councils do have the flexibility to impose either the general or more specific type of restrictions, it must be acknowledged that the reauthorized Act is quite clear that a wider range of potential owners is now possible. The Councils need to be sure that any limitations are necessary to achieve the management objectives. The full economic and social impacts of various types of limits should be carefully considered when making these decisions.

While the Act does not give specific direction with respect to where in the above range that the eligibility to own criteria should be set, it does address the subject with respect to the related topic of criteria for making the initial allocation of harvest privileges. To ensure fair and equitable initial allocations, the Councils are directed to consider: (i) current and historical harvests; (ii) employment in the harvesting and processing sectors; (iii) investments in, and dependence upon, the fishery; and (iv) the current and historical participation of fishing communities.

Once the eligibility to own criteria have been specified, (even if only in a preliminary or draft manner), then taking into account the other selected elements of the proposed program, the Council will be able to make initial estimates of the distribution and other effects of implementation. (Actually, the amount of formal study to get initial estimates may be quite minimal. Interested participants have a way of ensuring that their versions of the likely effects will be brought to the Council’s attention.). If some of the projected effects of the traditional IFQ program appear to be incongruent with the objectives of management, it may be wise to consider the use of RFAs, and to use the expected problems as a focus in determining how they should be designed. It bears repeating that it may make sense to consider tweaking the system to address these issues, rather than to take the plunge into using an RFA. For example granting harvesting privileges to both harvesters and processors could address distributional effects on processors. Although it

LAP Spotlight #4: Bering Sea & Aleutian Islands (BSAI) Crab (King & Tanner) Rationalization
<http://www.fakr.noaa.gov/ram/ifq.htm>

Vital Stats

First year: 2005.
Type of DAP: Quota Share (QS) & IFQ; Processor Quota Share (PQS) & IPQ; CDQ
Management units: BSAI King & Tanner Crab
Vessels / Gear types: Crab Pots, Offshore

Available Trend Data

Season length: Bristol Bay Red King Crab Days: 2004-5: 3; 2005-6: 26
Bering Sea Snow Crab (Opilio) Days: 2004-5: 5; 2005-6: 42 (Knapp 2006)
Ex-vessel value: \$125M (2004)
Consolidation: Between year before program and first fishing year, vessel registration declined by two-thirds for the Bristol Bay Red King Crab (BBR) fishery and by one-half for the Bering Sea Snow Crab (BSS) fishery, with a decline of about 900 BBR jobs and about 450 BSS jobs (about 15% of the decline for the BBR fishery from vessel buybacks).
Stock status: Overfishing: NO; Overfished: 2 stocks: blue king crab - Pribilof Islands, and blue king crab - Saint Matthew Island.

Nature of Harvest Privilege

Eligibility: License Limitation Program (LLP) license holders and qualifying crew members; initial quota distribution to US citizens/companies only. PQS may be transferred to any entity regardless of citizenship.
Duration: Open ended. Council can end the program through the normal Council process.
Transferability: Leasing generally allowed during first 5 years. Quota transfers allowed with a variety of restrictions.
Accumulation: Variety of caps on quota share and annual harvest privileges.
Initial Allocation: Historical landings.

Management

Identified Costs: 2007 estimated management costs are \$1.071M. Enforcement costs for 2005/06 fishing year were \$398k by NOAA and \$500k by the State of AK.
Cost recovery: For Crab only - NMFS collects 133% of the cost recovery fees, so that after the 25% for loan programs is deducted, 100% still remains for reimbursement of program costs.
Monitoring: Very detailed recordkeeping required. VMS required on vessels. Only a Registered Crab Receiver (RCR) is able to take deliveries. An RCR has to ensure that all CR crab are weighed on a scale that meets NMFS specifications and that all shoreline offloading of crab is conducted in accordance with a Catch Monitoring Plan (CMP) that the RCR has prepared and had approved by NMFS. RCR will have to submit real-time electronic landing reports. NMFS will be collecting effort, operating revenue, and cost data for all parties to determine the economic effects of the BSAI crab rationalization.

Special Insights:

would likely not find much support with harvesters, it may be preferred to certain types of RFAs.

If the Council wishes to expand its range of choice and consider a more broadly based LAP program which includes IFQs for individuals and LAPs for RFAs, it will still be *The design and use of limited access privilege programs.* November 2006 Preliminary Draft

necessary to make the choice with respect to ownership criteria for individuals. But in addition, it will be necessary to make an analogous but slightly more complex decision with respect to acceptable types and institutional structures for RFAs. Again, the choice of the latter may depend on the nature of perceived untoward effects of the traditional IFQ program.

At the first level, the possible range of institutional structures for an RFA would fall between the following:

- o A group of individuals each holding and using harvest privileges independently, but who may choose to share vessels and processing capability.
- o A corporate entity is granted ownership privileges and those privileges are used by or on behalf of its members according to an agreed upon annual plan that specifies, among other things, who will harvest, and where the product will be landed, processed and sold.

From a loosely joined collection of individuals to a monolithic centrally (but democratically) controlled union is a very broad range indeed. Also there is a large number of margins along which it can be expanded or contracted.

- o Will individual RFAs be allowed for the different types of participants (i.e., harvester, processor, etc.) or must RFAs be a composite group of specified different types of participants?
- o Will harvest privileges be transferable between RFAs or between an FRA and independent owners.?
- o [others?]

These are the types of questions the Councils will have to answer as they prepare the eligibility criteria for RFAs. Basically, Councils need to determine what kind of entities will most likely lead to the achievement of the fishery management objectives. Or to put it another way, they must determine what kinds of entities will be most useful in solving the untoward effects of instituting an independent IFQ program, and yet still allow for the achievement of the overall management objectives. It then needs to write participation guidelines to ensure that only those types of entities will be used.

If one accepts the contention that RFAs are to be used to mitigate the untoward effects of a straight IFQ program and that FCs are primarily for economic development, then the process of determining when to use FCs should be different than the above. While the concept of an FC may be related to the CDQ program, the conditions where they can be used in existing fisheries throughout the country are likely to be very different. To put it in the starkest terms, CDQ were given to isolated communities with weak economies composed of very poor ethnic minority individuals. The quota shares that they were given were part of a very large TAC of a healthy stock. Moreover, while there was heavy utilization of the stock, giving a small percentage of the TAC as CDQ did not have dramatic effects on the current users. In addition, some of the current users favored the

program because they foresaw the opportunity to gain access to these shares through the market place rather than racing across the high seas.

Most fisheries in the US today are fully utilized and many of them are overfished and will be, or are, undergoing rebuilding plans which means there will be short term reductions in harvest. At the same time, while there is a need for economic development in many small and remote places in the US, including fishing ports, the conditions are seldom as harsh as in the remote parts of Alaska.

It follows that if Councils choose to use FCs as mini-CDQ programs, they will be taking part of a decreasing pie away from current users, who because of restrictive regulations, may not be in the best of financial shape themselves. If constituents have weak support of LAPs in the first place, such an addition to a program will not be cheered.

On the other hand, economic development can be interpreted in a slightly different way. It may be that granting existing or historical users harvesting privileges in the context of an FC, may provide for economic development that was not possible when those users were involved in a competitive open access race for the fish. They will have the opportunity to cooperatively determine ways to harvest, process, and market the fish so as to increase the net returns and then distribute the gains amongst the members. It is also possible to focus these developmental gains because of the ability to actually grant harvesting privileges as part of the initial allocation. However, in addition to considering the issues discussed above with respect to how a Council would like an RFA to be organized, the eligibility criteria will have to be designed so that those eligible for economic development benefits are properly circumscribed.

As a final consideration, the ability to grant harvesting privileges as part of the initial allocation is something that could be very important to a Council as it strives to achieve overall management objectives. This being the case, a Council may choose to use a more general interpretation of a fishing community, and, noting carefully the differences specified in the law, use this type of organization in a LAP program, where all else equal it might us a RFA.

If the Council decides to use either FCs or RFAs, it will have to specify the criteria that will be used to evaluate the operation plans they must develop as part of their approval process. While the appropriate content of these plans will likely vary according to management objectives and the way in which the Councils choose to construct the entities, the following items will likely be useful or necessary. Some may also be necessary for an application to become recognized as a FC or an RFA, which would be a precursor to completing a final operations plan.

1. A statement of how the entity as organized meets the eligibility criteria specified by the Council.
2. A list of members including any pertinent information such as address, vessel or plant name, catch or processing history, or other data required for the initial allocation process.

3. The name and contract information of the representative or agent for service of process.
4. A plan on how the harvesting privileges will be used and by whom.
5. A plan to show how actual harvest of the group will not exceed the allotted harvesting privileges. This should include provisions for monitoring of all catch.
6. Rules for entry to and exit from the organization, including procedures for removing or disciplining members who do not abide by the rules, and for informing NMFS of such actions.
7. A contract signed by all parties that they will agree to abide by the plan.
8. A statement of operational rules including collection of fees, voting rules, etc.
9. [others?]

D. Duration

The term duration refers to the lifetime of a privilege or share itself and not its possession by any one entity. Possession of shares is governed by initial and subsequent eligibility requirements, transfer provisions, and other applicable rules. The MSA is very clear about some aspects of duration; LAPs may be revoked or limited in accordance with the act, they do not confer rights of compensation, and they do not create any ownership of a fish before it is harvested [303(d)(3)(b, c, and d)].

Given these constraints the policy choice is between making the privileges as permanent as possible (to provide appropriate incentives and minimize long term management costs) and various limited horizon options (to provide management flexibility). The potential options include:

1. Privileges assigned for the duration of the LAP program.
2. Privileges assigned for a fixed term with periodic automatic renewal for entire program unless Council terminates program. Alternatively, once they are renewed, the privileges are assigned for duration of program.
3. Privileges assigned for a fixed term with periodic possible renewable for entire program if Council votes to renew program. Alternatively, once they are renewed, the privileges are assigned for duration of program.
4. Privileges assigned for fixed term with periodic automatic renewal for those owners who, after going through an administrative review, are judged to have met specified criteria. Any privileges not renewed are reallocated. Alternatively, once they are renewed, the privileges are assigned for duration of program.
5. Privileges assigned for a fixed term with periodic possible renewable for those owners who, after going through an administrative review, are judged to have met specified criteria. Any privileges not renewed are reallocated. Alternatively, once they are renewed, the privileges are assigned for duration of program.
6. Privileges assigned for fixed term after which the entire program terminates and management reverts to a predetermined program.

Under any of these options, the Council always has the option of revoking the LAP program by amending the current FMP. The difference between them is the degree of

permanence of the privilege and the degree to which the Council will be required to take explicit action to keep the LAP program in place.

Those who argue for requiring explicit Council action want to mandate a structured debate to ensure all issues are reconsidered taking into account any lessons learned. They would not want things to continue by a wave of the hand or if the Council is busy with other tasks after the fixed term expires. Others would argue that since the Council always has the opportunity to re-look at the LAP program, a mandate to do so is overkill and will necessitate considerable work that may not be necessary. Further, the Council will be in a better position to judge if it is necessary after viewing the operation of the program.

The degree of permanence is a slightly different story. By allowing the privilege to be as permanent as current policy allows, the owner will have the securest possible planning horizon and will have better incentives to make efficient investments in harvesting and processing equipment and to develop market channels. Longer term privileges are expected to generate greater economic returns than shorter term privileges, thus, on economic efficiency grounds, a permanent quota is generally considered superior to a fixed term quota. Also, the longer the duration of privileges, the greater is the fishermen's stake in the fishery and stronger the desire to conserve and protect the resource.

Another potential drawback to fixed-term privileges is the indirect cost incurred by owners. With periodic allocations of fixed-term quotas, individuals would likely expend extra effort to protect their allocations, or even seek favored treatment to increase their allocation. They will have the incentive to engage in activities to influence their access to quota (e.g., by challenging the interpretation of allocation rules so as to increase their share). These activities use valuable resources in socially non-productive ways. Unless the rules for the periodic allocation of privileges are carefully thought out, the process will generate unanticipated and wasteful efforts by the fishing industry.

Some have argued in favor of shorter, fixed-term privileges on the basis of political flexibility. This can be important when an ITQ program is being considered for the first time and there is uncertainty about how well the program will work out. If quota privileges are initially set for a short period of time, it will be easier to modify the program and even abandon it if necessary. For example, if the initial allocation of quota is deemed inappropriate, a short, fixed-term privilege allows the Council to re-adjust the allocation to better suit the goals of the program. While fixed term limits do offer some flexibility and the ability to learn and adjust, by their very nature they will increase the amount of time and resources that the Council and NMFS will have expend to prepare and approve plan amendments at regular intervals.

As an example of the last point, a fixed terminal point for a DAP program means that the Council will likely have to specify what sort of regime will be put in place the day that the DAP program ends. This means that the replacement regime will have to be evaluated with the same care as is any other management regime. This means that a DAP

management plan with a fixed terminal point will effectively be two plans in one and will require twice as much work.

<p>LAP Spotlight #5: Pacific Whiting Conservation Cooperative http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/Whiting-Management/index.cfm, pacificwhiting.org.</p>	
Vital Stats	
First year:	1997.
Type of DAP:	Cooperative.
Management units:	In pacific whiting management, there are 3 sectors: Catcher/processor sector, mothership sector, shoreside sector. Each sector receives a portion of the commercial OY. The Catcher/Processor sector has 34% of the quota and formed a cooperative in 1997.
Vessels / Gear types:	The catcher/processor sector is comprised of vessels that harvest and process whiting, pollock, and other fish & crabs. Vessels are large (250-400 foot range).
Available Trend Data	
Season length:	In 1996, Catcher/processor sector had ~20 days. In 2002, Catcher/processor sector had ~165 days.
Ex-vessel value:	\$10 M annual additional revenue (\$2-4 M profits) related to co-op, related to the percent of edible product from total harvest increasing significantly after first year of cooperative fishing (Gil Sylvania). Because these are catcher-processor vessels there is no trip ticket upon which to calculate a traditional ex-vessel value.
Consolidation:	Since 1997, only 6-7 of the 10 eligible catcher-processor vessels have participated in the fishery. "Efficient" operators leased shares from "inefficient" operators. The other vessels likely entered other fisheries.
Stock status:	Currently - Overfishing: NO; Overfished: NO
Nature of Harvest Privilege	
Eligibility:	Open to 4 firms with 10 eligible catcher-processor vessels (limited access).
Duration:	Open ended. Annual Operations Plan must be approved by NMFS. Council can take action to end the program through the normal Council process.
Transferability:	Transferable within cooperative. Leasing occurs.
Accumulation:	The Justice Department specifically approved this cooperative and a certain amount of accumulation could raise anti-trust issues.
Initial Allocation:	NMFS/Council determined allocation to sector, firms negotiated relative shares.
Management	
Identified Costs:	Management costs for the sector may have declined because industry has taken responsibility for funding real-time reporting. Likely minimal incremental enforcement costs.
Cost recovery:	PWCC members are assessed a tonnage fee that is used to fund co-op administrative costs and scientific research (funding stock assessment and bycatch avoidance programs).
Monitoring:	Full time observer coverage. Catches reported to private reporting service. Reports shared to improve bycatch avoidance.
Special Insights:	

An option that is related to duration is a use it or lose it provision. The notion is that if the owner of exclusive privilege to harvest a portion of the nation's fish stocks does not use it, it should be turned over to someone who will. Otherwise consumers will have access to less fish and the opportunity to provide earnings to the industry will be lost. While at the surface this appears to be logical, there are many reasons why owners of privileges might not use their AHP in any given year. For one thing there may not be a

profitable market for the fish and other times the fish may not be accessible to the gear. If participants can not find the fish or can not sell them at a profit if they catch them, it does not make sense to penalize them. In addition, a use it or lose it policy would prohibit individuals, including NGOs, from taking independent conservation actions by allowing some fish to remain in the water.

E. Transferability

The constraints of the MSA with respect to transferability are as follows:

- In establishing a limited access privilege program, a Council shall—
 - (A) establish a policy on the transferability of limited access privileges (through sale or lease), that is consistent with the policies adopted by the Council for the fishery under subparagraph (5); and
 - (B) establish criteria for the approval and monitoring of transfers (including sales and leases) of limited access privileges. (Include proper citation)

Subparagraph (5) provides criteria to be considered in making initial allocations.

Transferability refers to the legal ability to transfer the ownership of the privileges from one entity to another. In brief, the advantages of transferability are the flexibility given to participants and the incentives that it provides to produce the allowable harvest as efficiently as possible. Those that argue against transferability would stress that it has the potential to disrupt the current industry structure. Others are opposed to transferability because it allows individuals to permanently gain from the sale of harvesting privileges rather than to use them to harvest fish.

When speaking of transferability of LAPs, especially IFQs, it is useful to distinguish between the quota share (QS) itself and the annual harvest privilege (AHP) which the QS generates. Given normally accepted policy, the QS is denominated in terms of a percentage of the TAC. The AHP, on the other hand, is denominated in terms of weight of allowable harvest that is generated for a given year by multiplying the percentage share times the TAC. Transferability can apply to both the enduring privilege and the annual catch privilege. Given these multi-dimensional characteristics, the main options for transferability can be summarized as follows.

Option 1.	QS - transferable	AHP - transferable
Option 2.	QS - transferable	AHP - non-transferable
Option 3.	QS - non-transferable	AHP - transferable
Option 4.	QS - non-transferable	AHP - non-transferable

One critical element of options 3 and 4 is that with no QS transferability, there must be a process to reallocate the LAPs once an owner has died or retired from fishing. Without QS transferability, the allocation question must be faced over and over again.

Transferability allows owners of LAPs to buy, sell, give away or lease their privileges. Buying or selling an AHP is equivalent to leasing in the normal sense of the word. The first issue related to transferability is whether transfer of quota shares should be allowed at all; the second issue is what restrictions, if any, should be imposed on transfers if they are allowed. In general, the ability to transfer quota enhances the economic performance of the fishery, provides fishermen with a valuable asset and compensation if they choose to leave the fishery, and tends to strengthen fishermen's desire to conserve and protect the resource on which the ITQ is based.

The trading of resources among firms encourages the evolution of efficient sized production units. For maximum economic performance, the number and size of firms in an industry must adjust over time as technology and markets vary. This can be accomplished through private transactions in financial capital, equipment, natural resources, and technology. Similarly, transferability of harvest privileges in a commercial fishery allows firms to accumulate quotas to achieve a quantity and species mix consistent with low cost, efficient operation. In general the harvest privileges will flow to the more efficient operators. Transferability of QS is necessary to make long term adjustments in firm output for example when purchasing a new boat. At the same time transferability of AHPs allows for short term flexibility to change annual production due to vessel repairs, to assist in end of season mop up activities, etc..

Finally, transferability helps share holders to plan future transactions, and it gives them an economic incentive to preserve the underlying sources of value in the resources they own. A run-down house will have less value when sold than will a well-kept house. Similarly, an LAP will be more valuable if the fish stocks underlying it are in good shape. Hence, transferability encourages the quota owner to think clearly about future consequences of near-term harvest activities.

While some may agree that that transferability offers incentives that allow for increases in efficiency, they may not like the fact that the gains which are generated go to the individuals or entities which receive the initial allocations rather than to the general public. As such they oppose, as a matter of principle, any transferability. The ability to auction off the LAPs, rather than give them away, may in some cases soften this opposition.

There is a middle ground between complete transferability and prohibitions on any transferability. Limitations on the types of trades that are permitted may be justified in certain circumstances. The initial allocation will likely include individuals who differ by gear type, boat size, firm size, type of final product, home port, area(s) fished, etc. Free transferability between all such individuals may result in changes in the industrial or cultural aspects of the fishery which the Council may wish to prevent because they run counter to overall objectives of the relevant Fishery Management Plan. Restrictions on transfers between specified groups may help prevent such changes. However, they will also limit the flexibility of participants and in the long term could become a stifling influence on the development and efficient utilization of the fishery as a whole. Further, it

is useful to keep in mind that some degree of fleet consolidation is often desirable or necessary, and may even be an objective of the FMP.

Another important issue is the effect of transferability rules on the cost of implementing the LAP program. While on the one hand a complete prohibition on transfers may reduce administrative costs in the short run, the necessity to go through the initial allocation process on a regular basis may be more expensive in the long run. Likewise restrictions on transfers between vessel types or areas will increase transaction costs because it will be necessary to ensure that the buyers and sellers are meeting all of the rules.

While unrestricted transferability may permit concentration of privileges in the hands of a few large producers, resulting in noncompetitive market structures and subsequent losses in economic performance, this is a slightly different issue and is treated in the section entitled excessive shares.

Using the above analysis it is possible to analyze the above transferability options in more detail. The rationale for options 1 and 4 are obvious given arguments for and against transferability. Option 2 could be preferred by those who favor the option of giving of allowing new participant the ability to gain “enduring” access to the fishery but who object to “sea-lords” who own the enduring right but do not participate in fishing. Rather they merely sell their annual privileges each year. On the other hand, option 3 would be preferred by those who do not want recipients to make permanent gains by selling the enduring privileges, but acknowledge the advantages of allowing participants to make short term adjustments in the amount they harvest in any year.

Of course it is possible to modify Options 1, 2, and 3 by allowing limited transferability with specified restrictions designed to meet other fishery management objectives. There are not hard and fast rules on how to structure each option. However, the issues of consideration should include the importance of the management objective, the degree to which the restrictions will lead to the achievement of the objectives, the effect they will have on individual flexibility and overall fishery-wide efficiency, and the impact they will have on regulation and monitoring activities and expenses.

The discussion thus far has been general because the same principles apply regardless of the type of LAP program. Options 1 through 4 are possible alternatives for traditional IFQ programs or more generally defined LAP programs. However, given the nature of RFAs and FCs, certain options may be more desirable than they otherwise would be for IFQ programs. For example, to achieve the goals of developing a FC, it may be wise to ban the sale of QS to ensure that the basic asset remains in place. However, sale of AHP may be useful for inter-temporal adjustments or to earn income to achieve certain development goals.

Given the specific legislative reference to RFAs purchasing LAPs on the open market, Congress appears to look favorably on transferability of LAPs between RFAs and between RFAs and other participants. However, the Council is free to place whatever restrictions it feels are necessary, subject to the above considerations.

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There is also something to be said for a transition phase in a LAP to allow participants the time to learn the benefits and costs of buying and selling QS and AHP. In recent research, Anderson and Sutinen [citation] have shown that in experimental markets for fishing quotas, the system was working better in the long run if only AHP were transferable in the first few years of the program but sales of QS were prohibited.

F. Excessive Share

While harvesting privileges offer many potential advantages, a concentration of ownership can lead to at least two different types of problems. One is market power including monopoly or monopsony. These problems are possible in other sections of the economy as well; it is not a problem unique to LAPs. A second problem is that the potential for concentration can lead to undesired changes in the structure of the fishing community broadly defined.

There are at two different types of market power problems that can follow from concentration of privileges. First, an operator may obtain monopoly power in the sale of fish products to the general consumer. The search for monopoly profits will lead to an artificial reduction in output and increase in prices to the consumer. In most instances the threat of this actually occurring is quite small because the product from any one LAP program must compete with similar products from other international fisheries. Only when the LAP is for a unique fishery with a separate market niche is this likely to become as problem.

Second, a participant may obtain a significant amount of the quota shares and thus operate as a monopsonist or monopolist in the market for quota. Such market power can reduce the actual transferability of quota and hence prevent an ownership pattern which allows for the most efficient operation of the fleet. This type of market power is more likely to occur than market power in the sale of final product.

The second type of problem that can result from concentration of ownership has to do with the life style of fishing households and fishing communities. There can be significant philosophical support for the maintenance of a fishery composed of many diverse individuals. According to this view, even if concentration will not produce market power problems, it is something to be avoided for its own sake.

While there are valid reasons for considering limits on ownership, such limits have their weaknesses as well. A main purpose of using LAPs is to allow individuals to have the flexibility to obtain more quota so as to be able to use more efficient vessels, either on their own account, or in combinations with others. Caps on ownership, or even the right to use more than certain amount of quota on one boat even if they are owned by different individuals, can be a direct barrier to such activities and this can result in significant losses.

An important reference point for discussions of “excessive shares” is National Standard 4:

Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocations shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges. 16 U.S.C. § 1851(a)(4).

LAP Spotlight #6: Pacific Sablefish Permit Stacking Program	
Vital Stats	
First year:	2001.
Type of DAP:	Under this permit-stacking program, a vessel owner may register up to three sablefish-endorsed permits for use with their vessel to harvest each of the primary season sablefish cumulative limits associated with the stacked permits.
Management units:	Limited entry, fixed-gear primary sablefish fishery off Washington, Oregon and California. There are 3 permit tiers of cumulative catch limits. NMFS calculates the size of the cumulative catch limits such to a set ratio.
Vessels / Gear types:	Fixed Gear
Available Trend Data	
Season length:	9-10 days before stacking program, Apr. 1 - Oct. 31 currently.
Ex-vessel value:	2000 (CA, OR, WA): ~\$21M; 2004 (CA, OR, WA): ~\$17M.
Consolidation:	164 Original Permits though not all permits were being used at the time of permit allocation. It is estimated that there are 60-80 boats in the fishery, with significant use of stacked permits.
Stock status:	Currently - Overfishing: NO; Overfished: NO
Nature of Harvest Privilege	
Eligibility:	Prohibition on ownership of permits by partnerships or corporations (unless grandfathered); an owner-on-board requirement; a prohibition on at-sea processing of sablefish.
Duration:	Open ended. Council can end the program through the normal Council process.
Transferability:	Under this permit-stacking program, a vessel owner may register (obtained through sale or lease) up to three sablefish-endorsed permits for use with their vessel to harvest each of the primary season sablefish cumulative limits associated with the stacked permits.
Accumulation:	A limit of three permits can be stacked per vessel.
Initial Allocation:	There are three tiers of annual catch limits that were based on historical harvest.
Management	
Identified Costs:	2007 estimated costs are \$0.160M w/o cost recovery. Region has not itemized costs for this fishery but will be for implementation of cost recovery program.
Cost recovery:	No, but working on it for Amendment 14-C.
Monitoring:	6 hours notice required before landings, sales recordkeeping, VMS. At least 24 hours (but not more than 36 hours) before departing on a fishing trip, a vessel that has been notified by NMFS that it is required to carry an observer, or that is operating in an active sampling unit, must notify NMFS (or its designated agent) of the vessel's intended time of departure.
Special Insights:	

Excessive share is referenced again in the section that grants Councils the power to create LAP programs.

(D) ensure that limited access privilege holders do not acquire an excessive share of the total limited access privileges in the program by— (i) establishing a maximum share, expressed as a percentage of the total limited access privileges, that a limited access privilege holder is permitted to hold, acquired, or use; and (ii) establishing any other limitations or measures necessary to prevent an inequitable concentration of limited access privileges. [Insert citation]

In the same section, the law states:

(B) to the extent practicable, consider the basic cultural and social framework of the fishery, especially through—(i) the development of policies to promote the sustained participation of small owner-operated fishing vessels and fishing communities that depend on the fisheries, including regional or port-specific landing or delivery requirements; and (ii) procedures to address concerns over excessive geographic or other consolidation in the harvesting or processing sectors of the fishery;

(C) include measures to assist, when necessary and appropriate, entry-level and small vessel owner-operators, captains, crew, and fishing communities through set-asides of harvesting allocations, including providing privileges, which may include set-asides or allocations of harvesting privileges, or economic assistance in the purchase of limited access privileges; (Insert proper citation)

The requirements to consider the allocation of shares to different entities, loan programs, and ways to address different types of consolidation are examples of possible management objectives that may affect what constitutes an excessive share. More to the point, there are specific instructions to develop procedures to address excessive geographic or other types of consolidation. But Councils must determine what “excessive” means.

It is clear that market power is one thing that needs to be considered in determining what constitutes an excessive share. However, Councils are also given considerable latitude to determine the management objectives for any FMP and to choose the subsequent management measures to achieve those objectives subject to the restrictions and obligations of all ten National Standards and other MSA requirements. National Standard 8 is of particular relevance to this discussion.

Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and the rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.16 U.S.C. § 1851(a)(8).

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Depending on the particular management objectives chosen and the ways in which the Councils decide to address the National Standards, it will be necessary to look at things other than simple market power to determine what constitutes an excessive share. However, it is useful to make a clear distinction between them because they address completely different issues, and are, for the most part, independent of each other. For purposes of discussion, this distinction will be maintained by referring to market power share and management objective share limits. An excessive share will exist if either limit is exceeded.

This section is divided into three parts. The first sets out the basic principle of how the excessive share limit can be conceptually determined by a joint consideration of market power (MP) excessive share and management objective excessive share. That is, the excessive share limit should at least be restrictive enough to prevent monopolistic price control, but it can be more restrictive depending upon a careful consideration of the ability to meet management objectives and potential negative effects on industry operation and plan administration costs. The next two sections describe the suggested procedures to specify each type of share limit.

While most of the economic analysis is placed in Appendix 1, the main conclusions are as follows. First, it is theoretically possible to solve for the value of an effective MP share limit, defined as the maximum percentage of quota that can be controlled by a single entity such that there will be no problems with market power output restrictions, either through actual output decisions or through restrictions on the sale or rental of the transferable annual harvest privileges, AHP, that are associated with the permanent quota share. Call this percentage value s^* . Second, the s^* market power share limit can address problems in both the market for fish and in the market for quota.

The discussion of the management objective (MO) share limit is different because, other than broadly defined benefit cost analysis, there is no body of theory, economic or otherwise, upon which to base the determination of the MO limit. Two points should be made at the outset, however. First, to be relevant, the management objective maximum share limit must be less than the market power share limit. Therefore if an operational MO share limit is chosen, it will preclude the necessity of rigorously determining s^* , because it will be a non-binding constraint. On the other hand, setting a management objective excessive share limit may not be enough to achieve most management objectives. Therefore they should be used with care and only when the perceived benefits are greater than potential costs, and only then where there are no less costly or less intrusive ways to achieve the same objective.

The Basic Principle

The basic principle for determining an excessive share limit can be stated using the heuristic diagram in Figure 2. Excessive share is expressed as an upper limit on the percentage of quota owned or controlled by a single entity (plotted on the horizontal axis). The market power share limit (MP limit), which is the bolded line in Figure 2,

establishes the upper limit for share accumulation based on market characteristics of a particular fishery. In principle, if this limit is exceeded, participants would control enough shares to be able to unduly influence the market price for the marketed product or the price of permanent or annual harvest shares.

Given the objectives of a particular FMP, the upper limit for management objective share limit (MO limit) may well lie somewhere to the left of the market power limit. The MO limit could be established based on the national standards, other MSA requirements, the objectives of the FMP based on relevant biological, social, cultural, and industrial organization characteristics of a fishery. In effect, the two limits work in concert to assure that potential share accumulation is consistent with management objectives and to protect consumers against manipulation of market prices.

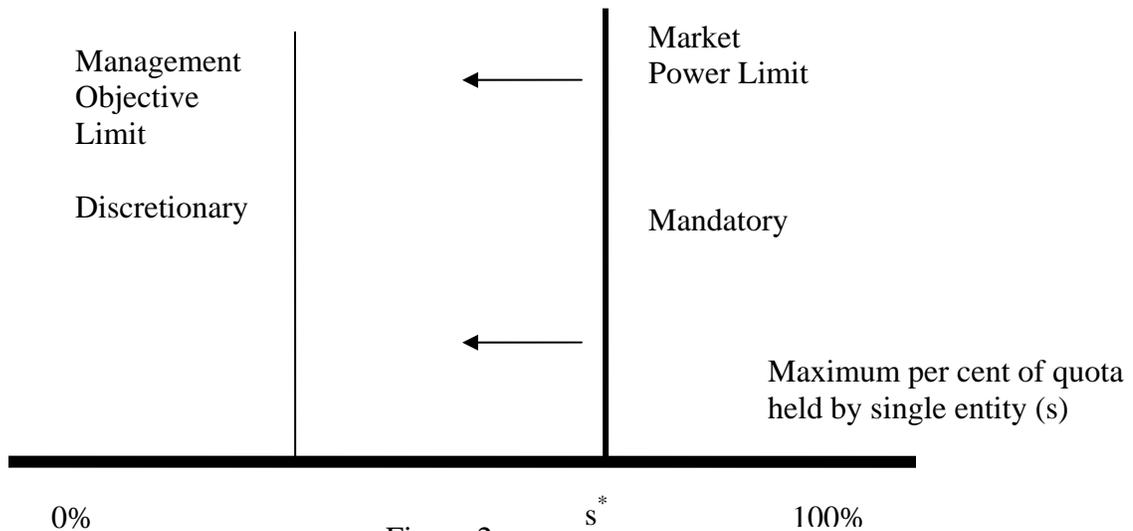


Figure 2

Making this conceptual framework operational means that the Council must determine the limit at which, in principle, participants would control enough shares to be able to unduly influence the market price for the marketed product or the price of permanent or annual harvest shares. This limit can be determined in a fairly straightforward manner, as described below. Once determined, this becomes the upper limit on the amount that can be controlled by one entity. Throughout this discussion, the MP limit will be referred to as s^* .

Once s^* has been determined, Councils have the prerogative to set more restrictive share limits if such limits are deemed necessary to accomplish stated fishery management objectives or to be in compliance with other National Standards, especially NS 8. That is, they may set a limit that is to the left of the bold vertical line in Figure 2. The question becomes what are the gains and what are the losses of moving the share limit progressively to the left. The problem here is that there are no established rules for

making such a judgment analogous to the rules to determine the market power excessive share limit.

The gains will reflect the degree to which the tighter limits will cause the LAP program to more closely meet the fishery management objectives. However, the tighter limits place restrictions on the output of individual entities that may lead to higher harvesting and processing costs. The Councils and NMFS will have to determine if the gains are expected to exceed the losses that may be generated by the lower limits. For example, if employment levels in an isolated port can be maintained at the expense of a 1% increase in the average cost of fish in a relatively small sector of the industry, the gains, although measured in a different metric, may well be worth the cost. On the other hand, if cost will increase 75% in a relatively large sector, a careful consideration may conclude that from a wider perspective the tighter restriction may not be prudent. It is difficult to specify hard and fast rules for determining exactly when the decision should switch from yes to no, but clearly these are the sorts of things that should be considered.

While conceptually the process consists of two steps (setting the outer MP limit and then, if deemed desirable, specifying a tighter MO limit), it is not always necessary for Councils to perform the analysis required for each step. The most obvious case is when the Council has no management objectives that will require tighter share limits. In that case, it is only necessary to consider the MP limit. On the other hand, if the Council has management objectives that it deems can only be achieved by a quite low MO limit, it will not be necessary to perform all the analysis to define the MP limit. It is only necessary to show that the chosen MO limit will for all practical purposes prevent market power abuses as well. Obviously this will involve a judgment call, but using the logic of the analysis to follow, if a Council were to choose, for example, a MO limit of 1%, there would be very little concern about market power. However, the Council would still have to show that the benefits of using that tight limit are greater than the potential cost increases described above. Appendix 1 provides more detailed background for the interpretation of this diagram.

In addition to the above, it is important to note that share limits are only one element in the design of an LAP program that will determine its relative ability to provide incentives for stewardship, cost efficiency, and higher productivity and to achieve other fishery management objectives. Other issues include determination of who is eligible to receive initial allocation, the exact formula for making such allocation, rules on transferability, and sunset clauses. Therefore Councils should not make a determination of excessive share limits in isolation.

Market Power Excessive Share

What has been termed market power excessive share has to do with the possibility that a single entity might control enough quota shares that it will have incentives to withhold production to raise market price. If this occurs, consumers will be hurt in two ways. First, they will pay a higher price for what they do consume, and second, part of the TAC will not be harvested and so there will be less available for consumption. The value of

this lost production is the inefficiency loss of monopoly. The purpose of this section is to describe a process for determining a market power share limit that will ensure that incentives to withhold production will be circumvented. This share limit, s^* defined above as the maximum allowable percentage of quota that may be controlled by a single entity, will be different for different fisheries and will depend upon the characteristics of the relevant markets.

LAP Spotlight #7: Gulf of Mexico Red Snapper http://sero.nmfs.noaa.gov/pubann/pa06/pdfs/FB06-038.pdf , http://sero.nmfs.noaa.gov/sf/RedSnapper/RedSnapperDocs.htm	
Vital Stats	
First year:	2007.
Type of DAP:	IFQ.
Management units:	Gulf Red Snapper.
Vessels / Gear types:	Gear types: bottom longlines, handlines, and bottom trawls
Available Trend Data	
Season length:	Under proposed IFQ program fishing year will be from January 1 through December 31.
Ex-vessel value:	\$10M (2004).
Consolidation:	This will be dependent on the ownership cap established in the Final Rule (2% cap = 50 possible owners; 5% cap = 20 possible owners; 10% = 10 possible owners; 7% cap = 12 possible owners. (Class 1 only).
Stock status:	Overfishing: YES; Overfished: YES
Nature of Harvest Privilege	
Eligibility:	Initial eligibility would be restricted to persons who own a Class 1 or Class 2 red snapper license. Permanent resident aliens who currently own a Class 1 or Class 2 license would be included in the initial allocation subject to any other qualifications included in this IFQ program.
Duration:	There is no limit to the duration of the IFQ program. However, a program evaluation will occur every 5 years. Council can take action to end the program through the normal Council process.
Transferability:	IFQ shares/allocations can be transferred only to individuals/vessels with a valid commercial reef fish permit during the first 5 years of the IFQ program, and U.S. citizens and permanent resident aliens thereafter. Eligible individuals must be U.S. citizens or permanent resident aliens.
Accumulation:	For any single fishing year, no person shall own IFQ shares that represent a percentage of the total, which exceeds the maximum percentage, issued to a recipient at the time of the initial apportionment of IFQ shares.
Initial Allocation:	Initial IFQ shares would be allocated proportionately among eligible participants based on the average annual landings associated with their current red snapper license(s). These data are available for the years 1990-2004 for some Class 1 license holders, 1998-2004 for Class 1 historical captains, and 1998-2004 for Class 2 license holders (see Action 5 in Amendment 26 for details).
Management	
Identified Costs:	2007 estimated costs are \$0.856M w/o cost recovery, and \$0.014M with cost recovery.
Cost recovery:	The fees would be calculated at the time of sale of fish to the registered IFQ dealer/processor after which the recognized IFQ dealer/processor would be responsible for submitting such fees to NOAA Fisheries Service. The collected fees would be submitted quarterly by the IFQ dealer/processor to NOAA Fisheries Service. For all IFQ pounds landed and sold, the cost recovery fee (3 percent) would be based on the actual ex-vessel value of the red snapper landings.
Monitoring:	New electronic reporting and monitoring system.
Special Insights:	

Before proceeding however, it is necessary to point out that after the introduction of LAPs, there may well be price increases that have nothing to do with market power. The halibut fishery is a good example. Under the previous regulations there was a race to fish that resulted in the product being processed in a very short period of time and frozen for consumption throughout the year. Under the LAP program harvesting has been spread more evenly throughout the year and the majority has been reaching the fresh market where it fetches a higher price. The higher price is the result of improvement in the quality of the product and the timing of how it reaches the market, not from a restriction in output. It is only the possibility of the latter that is important here. For practical purposes, this separation will not be much of a problem for the *ex-ante* studies under consideration here. The purpose is to determine if there is the possibility of market power before an LAP program is implemented. Price increases from improvements in product quality or seasonality of delivery, if they do occur, will do so after implementation. However, ex-post studies of LAP implementation will need to explicitly consider both potential causes of price increases. However, if the entire TAC is taken, or if firms with a high percentage of the shares use all their annual harvesting privileges, this would suggest that monopoly power did not constrain output.

The fundamental policy question is: What is the maximum percentage of the TAC that can be given to a single entity before there will be incentives to withhold production. Using basic microeconomic principles, it is possible to derive a formula for determining what that percentage should be for any given market situation. Using the calculated value of s^* as the excessive share limit will prevent undue market power in both the market for fish and the market for shares. It is beyond the scope of these guidelines to show how the formula is derived, but a detailed analysis can be found in [place citation here] In addition, Appendix 1 contains an abbreviated discussion of the derivation and provides suggestions for practical applications.

Management Objective Excessive Share

Once the Councils have set the market power excessive share limit, they are free to specify a more strict management objective excessive share limit. These tighter limits must follow from specific management objectives specified by the Councils. These management objectives must be set in accordance with the Magnuson-Stevens Act as discussed elsewhere in these guidelines. The Act addresses social considerations in LAP programs in section 1851 (national standards), section 1853(a) (required provisions of management plans), section 1853(b) (discretionary provisions of management plans), and section 1853(d), which addresses LAPs [Insert citation for new law].

National Standard 4, which includes a prohibition on the acquisition of excessive shares, also prohibits discrimination between residents of different States and provides that allocations of fishing privileges be “fair and equitable”. National Standard 5 directs Councils to “consider efficiency” when promulgating rules. National Standard 8 directs that conservation and management measures “take into account the importance of fishery resources to fishing communities, provide for the sustained participation of such

communities, and to the extent practicable, minimize adverse impacts on such communities.”

More generally, pursuant to section 1853(a)(9) of the MSA, social considerations should be addressed when a Council or the Secretary prepares a environmental impact statement. Furthermore, pursuant to section 1853(b), a Council or the Secretary has the discretion to establish a limited access system for a particular fishery. The establishment of such a system should take into account present participation in the fishery; historical fishing practices in, and dependence on, the fishery; and the cultural and social framework relevant to the fishery and to any fishing communities, among other factors.

In summary, the MSA National Standards and sections 1853(a), (b), and (d) either mandate or authorize a number of social objectives in LAP programs. At a minimum, these goals and considerations include:

- o Current and historical participation in and dependence on the fishery;
- o Fairness in allocations to fishermen who reside in different States;
- o Continued participation and economic welfare of fishing communities;
- o Special arrangements for entry-level fishermen, small vessel owners, and crew;
- o Social and cultural framework relevant to the fishery and any fishing communities,
- o Capability of vessels to engage in other fisheries.

This is by no means a complete list. There are also numerous other economic, cultural, and social issues that Councils may choose to address in a management objective. Within the context of these objectives, a management objective excessive share is one that will prevent or seriously jeopardize the achievement of these goals.

To set a management objective excessive share limit, the Councils must explicitly state the management objective(s) that will drive the determination of excessive share limits, and provide justification for choosing it (them). There are several key elements in this requirement. First, it must be explicit so that it can provide a meaningful basis for determining a excessive share limit. An objective to “address the cultural framework of fishery” does not really say anything. However an objective to “maintain the percentage distribution of harvest among gear types and ports with no more than a 5% deviation” is quite explicit. They must also discuss the reasoning used to select the particular objectives including a description of the perceived benefits of achieving these objectives. They must also show how these objectives are consistent with their mandatory duties and/or their discretionary authority under the Act and show how they are within the bounds of the other national standards.

The Councils also need to specify the share limit that will ensure that the objective, or set of objectives, is met and to show the justification for why that particular share limit is necessary. In other words if a Council selects a 2% maximum share limit they need to show why a limit any higher than that will preclude the achievement of the management objective(s).

If the Council wishes to address social and distributional goals, it should consider the full range of options of doing so. The rationale for this guidance is that across-the-board limits on ownership of quota shares will tend to reduce the economic efficiency gains of the LAP program. Other, more targeted measures may be able to achieve the social goals without compromising the anticipated economic improvement. As examples, the needs of fishing communities can be met by establishing community quotas within the larger LAP program. The continued participation of small-vessel and entry-level fishermen could be improved by using set aside programs. The relatively small share limit assigned to participants in the halibut/sablefish IFQ program was intended to provide for continued participation of the owner/operator class. Improved safety-at-sea can be achieved by more stringent regulations and better monitoring. The simple point is that many social and distributional goals can be adequately addressed without excessively constraining markets for quota shares in LAP programs.

At the same time, Councils should consider the effects of the more restrictive MO share limits to ensure that they do not adversely affect the achievement of biological goals or the management plan or of other social management objectives included in the plan.

Because some social goals are geographically specific, the more restrictive and lower limits, if necessary, should apply only to carefully designated regions and not to the entire LAP program. Examples of regionally specific social goals are: the protection of geographically remote fishing communities and assured minimum landings at designated ports. As a general rule, these regional goals can be achieved with measures that apply only to designated areas, and do not necessarily require an across-the-board lower and more restrictive limit on individual ownership of quota shares.

If a Council decides that, to meet a social goal, it must have a lower and more restrictive limit on individual ownership of quota shares, it should first conduct a careful analysis of the expected implications of that lower limit on economic efficiency. That way, a Council electing to adopt a more restrictive limit can make that decision knowledgeably, i.e., with full awareness of all the economic implications. Recall that National Standard 5 and E.O. 12866 require the Councils to consider economic efficiency.

The emphasis on market power excessive shares above was based on a concern for overall economic efficiency. Undue market power that restricts fishery output for monopoly purposes will mean that the net value of the overall consumer market basket is not as high as it could be. In this context, it is necessary to bear in mind that while an excessive share limit may be necessary to prevent undue market pressure, setting a management objective limit too far inside that limit may also cause inefficiencies. In this regard, the Councils need to list and quantify, to the extent possible, the likely negative impacts of the particular share limit they have chosen. Items to be considered include:

- o Possible increased harvesting costs
- o Possible increased processing costs
- o Possible increased data collection and management costs

o Possible losses in efficiency from the diminished overall flexibility and freedom for industry to adjust to normal market and stock fluctuations.

Finally the Councils must show that they have considered these extra costs and explain why they think the benefits from achieving the management objectives are worth the costs. Because of data limitations, it will likely be very difficult to estimate how a management objective excessive share rate will affect short and long run efficiency. However, it may be possible to use a very general analysis to get some rough estimates.

It is important to realize that while these guidelines discuss the issues that must be addressed to prevent any entity from obtaining an excessive share of the harvest privileges associated with an LAP program, the required work should be performed as an integrated part of the analysis of the overall plan. As indicated in the previous section, there are many ways to design an LAP program. The options chosen will depend upon the management objectives of the plan.

Because share limits are only one part of the design of an LAP program, there are three different circumstances under which the basic principle could be applied. The first case is where the overall design of the program does not include management objective excessive share limits. This would occur if the Council felt it could best achieve the management objectives by instituting other program elements such as allocation by vessel class, an owner on board rule, transferability limitations or restrictions on where fish can be landed. While it will be necessary to analyze the efficiency effects of these elements, as far as excessive share is concerned, it will only be necessary to determine the s^* rate to control for market power.

The second possible situation would be where the overall design elements include a very restrictive management objective excess share limit. For example, it is forbidden for any entity to control more than 1% of the quota. In this case the research should focus on the potential efficiency cost of this limit. If the efficiency costs appear reasonable in relationship to the benefits of achieving the management objectives, it would not be necessary to do an extensive analysis of s^* . A cursory examination to show that given the likely values of the critical parameters, the value of s^* is higher than 1% would suffice.

The final possibility is that the overall LAP program design includes a management objective excessive share limit of intermediate size such that it may allow for market power. In this case it would be prudent to do a careful market power analysis first. If it can be shown that the chosen management objective excessive share rate is greater than s^* , it would not be permissible to use it as the overall share limit for the LAP program. Rather it would be necessary to reduce it to at least s^* . On the other hand, if the management objective share limit is less than s^* , then it will be necessary to consider its effects on efficiency.

One other thing to note is that the efficacy of an excessive share limit depends upon the ability to monitor ownership. Therefore a necessary part of establishing a share limit is

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the design of a record keeping system that will be able to do so. This will require a record keeping protocol that will be able to identify who owns quota and how much. It will be necessary to maintain detailed records of ownership transfers that clearly identify who is buying and who is selling.

LAP Spotlight #8: Wreckfish	
http://www.safmc.net/Portals/6/Library/FMP/SnapGroup/SnapGroupAmend5.pdf	
Vital Stats	
First year:	1992.
Type of DAP:	ITQ
Management units:	Wreckfish (Atlantic offshore fishery)
Vessels / Gear types:	44-76 foot vessels with hydraulic reels fishing multiple circle hooks.
Available Trend Data	
Season length:	
Ex-vessel value:	
Consolidation:	Boats left this fishery because of lower grouper prices. Wreckfish was a substitute product for grouper. 2003 had 2 boats with landings.
Stock status:	Currently - Overfishing: NO; Overfished: NO
Nature of Harvest Privilege	
Eligibility:	5000+ pounds total dressed catch 1987 through 1990 and documented landings 1989-1990.
Duration:	Open ended. Council can end the program through the normal Council process.
Transferability:	Quota shares are transferable. Yearly allocations are transferable to other share holders.
Accumulation:	10% initial cap, no cap thereafter.
Initial Allocation:	Half of shares divided equally among eligible participants, half divided according to 1987-1990 catches.
Management	
Identified Costs:	2007 estimated costs are \$0.016M w/o cost recovery.
Cost recovery:	None.
Monitoring:	Dual entry system with coupons issued by NOAA Fisheries. Boats must have coupons for catch on board, fish houses must have dated coupons for fish in house.
Special Insights:	

2. Initial Allocation

A. Introduction

The initial allocation of harvest privileges is obviously very important. It will, for the most part, determine who gets the early gains from an LAP program. It will determine who will be the initial participants in the fishery. How future participants will be determined depends upon the rules for transferability and the duration of the program. The importance of this decision notwithstanding, for the most part the initial allocation issue is independent of other components of an LAP program. Given flexible transferability rules and non-expiring harvest privileges, allocation decisions only have to be made once. And, under

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these conditions, the exact makeup of the initial allocation will not affect the conservation or ultimate economic performance of the program. (Put another way, the fact that there will only be the need for a single allocation is an argument in favor of transferability and unlimited duration.). To maintain a balanced focus when considering LAPs, the relative independence of the initial allocation question from the other issues should be kept in mind. Otherwise, it is possible that the distributional issues will unnecessarily cloud or overshadow the discussions of other important, but basically independent issues.

The Act does specify general guidance on initial allocation:

In developing a limited access privilege program to harvest fish a Council or the Secretary shall— (A) establish procedures to ensure fair and equitable initial allocations, including consideration of—(i) current and historical harvests; (ii) employment in the harvesting and processing sectors; (iii) investments in, and dependence upon, the fishery; and (iv) the current and historical participation of fishing communities; (B) to the extent practicable, consider the basic cultural and social framework of the fishery, especially through the development of policies to promote the sustained participation of small owner-operated fishing vessels and fishing communities that depend on the fisheries, including regional or port-specific landing or delivery requirements; (C) include measures to assist, when necessary and appropriate, entry-level and small vessel operators, captains, crew, and fishing communities through set-asides of harvesting allocations, including providing privileges and, where appropriate, recommending the provision of economic assistance in the purchase of limited access privileges to harvest fish. (insert proper citation.)

In summary, the allocations must be fair and equitable and they should consider the cultural and social framework of the fishery⁴. However given the use of terms such as “including considerations of” and “to the extent possible,” there is a considerable freedom in determining exactly how the harvest privileges will be distributed. The discussion here will not attempt to list all of the things that can not be done other than to say any distribution that showed blatant favoritism or utter disregard to the “fair and equitable” standard in the law would likely not be approved nor would it withstand legal challenge. Similarly there will be no attempt to make a list of all the permissible procedures or formulae that could be used. Rather the discussion will focus on procedures and lessons learned. The goal will be to assist the Councils as they use their ingenuity and inventiveness to develop allocation procedures taking into account the recent changes in the Act.

The initial allocation task can be broken down into two parts. First, it is necessary to select the pool of entities that will be eligible to receive harvest privileges. The basics of

⁴ Note however that the material under (B) has more to do with restrictions on the use of the harvesting privilege than it does with initial allocation, but the two are related.

this step have already been discussed in the section on eligibility to own above. It is possible however, that the pool of potential recipients can be a subset of those who are qualified to own privileges. The Council may approve of certain types of entities being able to acquire privileges in the open market, but may feel that they do not merit an initial allocation. Congress has placed RFAs in this category.

The second step is to determine how the privileges will be distributed among those in the designated pool. Under the reauthorized MSA, there are two ways that this can be accomplished. First as has been done in the past, the privileges can be given away according to specified allocation formulae. It is also possible to use auctions to sell the initial privileges as long as the auctions are constrained such that they meet the “fair and equitable” standards specified in the Act. It may be that if auctions are to be used, they would be most appropriate in traditional IFQ programs, but Councils may also wish to use them for RFAs or FCs as well. The two possible ways of allocating the privileges will be discussed in turn. The revised MSA also allows rent collection with formula based allocations, and this will be treated in a separate section.

B. Free Formula-based Allocations

There are literally an infinite number of allocation formulae acceptable under the MSA, and it will not be possible to list and discuss all of them here. It is possible however, to list some of the attributes upon which the formulae can be based. In the IFQ programs that have already been adopted under the MSA, the attributes were related to various aspects of participation in the fishery, primarily catch, capital investment, and number of years fished over a reference period.

In response to suggestions to expand the pool of eligible recipients that lead to some of the most recent revisions in the Act, characteristics of entities have become other attributes to consider. Examples are size, ownership characteristic (owner-operated), and operating location of the firm, various measures of dependence on the fishery including percent of revenue or opportunities to participate in other fisheries, and inter-relations with other fishery related business especially with respect to employment.

To be frank, the participation attributes, though not without controversy, are relatively easy to handle both conceptually and with respect to data availability. For example, in the surf clam and ocean quahog program, the allocation formula was based on a weighted average of a relative catch index and a relative investment index. Working with characteristic attributes will likely be a different story. Coming up with appropriate measures of the specific characteristics that can be calculated given existing or readily available data, and then using several of them to come up with an actual allocation formula will be a somewhat more difficult task. Nonetheless it is a task that will have to be accomplished by those Councils who choose to broaden the potential range of eligible entities.

The following discussion starts of with a consideration of the relatively easy participation attributes in the context of traditional IFQ fisheries. Using that as a base, the discussion

will turn to a preliminary assessment of the consideration of both types of attributes in the context of more general LAP programs.

Traditional IFQ programs.

If the eligible group is restricted to vessel owners, the allocation formula could be based on equal shares (for all individuals satisfying some minimum requirements), vessel size, catch history, the number of consecutive years of participation in the fishery, or some combination of two or more of these factors. One problem with equal shares is that part-timers will have their relative shares increased, and highliners (those who have historically accounted for a disproportionate share of the landings) will be brought down to the level of the average fisherman.

If the eligible group also includes crew members, it might be difficult to use catch histories for logistic reasons (turnover rates of crew are high and there may be no records of who was on which boat when catches were taken). Allocations to crew members could be based on either equal shares or the number of years of participation in the fishery or both. If both vessel owners and crew members are considered to be eligible to receive an initial allocation, it would probably be necessary to include several of the above categories in the allocation formula. For example, 30% of the total quota could be divided equally among all eligible parties, 30% could be divided on the basis of the number of years of full-time participation in the fishery, and 40% could be split among vessel owners on the basis of vessel size. Strategies of this nature (perhaps with the percentages split out differently) should be explored with the industry as alternatives to strategies that rely on catch histories. An alternative that avoids the necessity of deriving an allocation formula is to use a lottery system.

Identified options:

1. Allocate shares equally among eligible recipients.
2. Allocate shares on the basis of vessel size.
3. Allocate shares on the basis of catch histories.
4. Allocate shares on the basis of historical participation.
5. Use a lottery to allocate shares.
6. Allocate shares using combinations of two or more of the above.

General LAP programs.

There is little new in the above discussion for those individuals who have watched the current IFQ programs being developed. It is all second nature. However, to consider how to approach more complicated cases where LAPs are given to both traditional

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recipients and to FCs and may be available for purchase by RFAs, it will be useful to go back and recreate the mental process thought which the above potential options were developed. Given the laws and accepted views on who were potential recipients, a main concern at the time was to set up an allocation that would change the fishery from the status quo to an IFQ fishery with a minimum disruption of the current distribution between the recipients. If that was the goal, the question became what sorts of things could be used to quantitatively compare allocation among the potential recipients. Looking at participation characteristics was a good way to do this. Catch histories are a way to compare the relative success of various participants. Comparing the financial investments shows, albeit imperfectly, relative commitments to a fishery, and at the same time, relative differences in amounts that will have to be earned to support the capital equipment. It is interesting to note that the two measures will provide different rankings. A smaller older boat operated by a high-liner could have a very good catch record but could be way low on the financial investment ladder. Which measure is best? That is a judgment call. At the same time, others may not like either of these measures and would argue for years of participation. Finally others would suggest that the notion of maintaining the existing distribution is not appropriate and would argue for an equal distribution. The allocation formulas actually used were usually based on more than one of these measures.

Consider now the problem of coming up with an allocation formula or procedure for a more general LAP program. It would certainly be permissible to use the same type of measures that have been used in IFQ programs. However, such measures may miss some of the elements or issues that are being addressed by allowing FCs to receive harvesting privileges. It may be possible to correct for this by only using a subset of the measures or to use different weights when comparing making weighted averages.

If Councils want to do more, it may be useful to go through the same type of exercise as described above. For example, what are the motivations for choosing to use an FC in a particular case? Assume that it is the ability to look at the full range of fishery related business including processing, supply companies, and downstream marketers. Then find some measures that capture the specific issues that are being addressed, and can be quantitatively measured. Some possibilities include, total employment, employees per unit of fish, percentage of net revenue that remains in the area, etc. The final step would be to turn these measures into an allocation formula. It should be stressed that the above is an example only. The point is to demonstrate a process that the Councils can use to expand the standard ways of calculating allocation formula if they choose to do so.

It would also be possible to use different types of formulae with general LAP program. The Council may split the TAC into two parts and allocate one part as IFQs according to more or less traditional methods and allocate the second part to FCs with other methods.

Even with this vast array of choices, it is probably impossible to devise a system that will be perceived as equally fair by all eligible entities. To improve the perceived fairness it would likely be very helpful if the Council were to consult with the members of the selected pool or a broader constituency.

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LAP Spotlight #9: Surf Clam and Ocean Quahog ITQ
<http://www.mafmc.org/mid-atlantic/fmp/history/scoq.htm>,
<http://www.nero.noaa.gov/sfd/clams/>

Vital Stats

First year: 1990.
Type of DAP: ITQ.
Management units: Surf Clams, Ocean Quahogs, Maine Ocean Quahogs.
Vessels / Gear types: Mostly larger vessels with hydraulic clam dredges - landings in standard cages with cage tags. Maine fishery is smaller-scale.

Available Trend Data

Season length: 6 hours every other week pre-IFQ to full year currently.
Ex-vessel value: 1990: ~\$44M; 2004: \$59.2M.
Consolidation: From 1988 to 1994 the number of firms in the fishery declined 50% in the surf clam fishery and 29% in the ocean quahog fishery. From 1990 to 1997, numbers of active vessels declined by 74% in the surf clam fishery and 40% in the ocean quahog fishery.
Stock status: Overfishing: NO; Overfished: NO

Nature of Harvest Privilege

Eligibility: No foreign ownership but otherwise anyone can buy and fish quota.
Duration: Open ended. Council can end the program through the normal Council process.
Transferability: Fully tradable and there has been an active market.
Accumulation: None.
Initial Allocation: Initial ITQ shares of the fishery quota were issued to vessel owners based on a formula of historical catches (80%) and vessel size (20%).

Management

Identified Costs: \$274,000.
Cost recovery: None.
Monitoring: Cage-tagging requirement and mandatory reporting to NMFS by vessel owners and dealers of clams landed and purchased. Allocation permit numbers must be reported on both vessel logbook reports and dealer-processor reports. Dealers and processors must have annual permits. Enforcement relies heavily on shoreside surveillance, the cage tag system, and cross-checking logbooks between vessels and processors. At-sea and air surveillance to reduce the possibility that vessels with state permits or cage tags may stray into federal waters.

Special Insights:

C. Auction Allocations

Introduction

Auctions are sales in which items are sold to the highest bidders. The current MSA gives Councils the explicit authority to use auctions to simultaneously allocate limited access fishing privileges and to collect royalties. It is important to focus on both aspects of these simultaneous actions. Although the general topic is initial allocation, the revenue generation component is critical as well. The first thing to note is the collection of royalties is logically different than cost recovery and the two are treated separately in the MSA. The principle of cost recovery is that participants in a managed fishery should pay some or all of the cost of running the management program. (Logically the principle

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could apply to fisheries with all types of management, but it is only applied to LAP managed fisheries in the MSA.) The principle behind a royalty collection program is to transfer some of the financial gains earned from the use of a public resource to the general government coffers. More specifically with respect to LAPs, the notion is that a LAP program eliminates or reduces open access wastes and provides incentives for efficient use of the stock, which is ultimately a public resource. Some of the gains can be siphoned off so that the rewards of efficient use can be shared between the recipient of the LAP and the general public. Similar programs exist for the use of government owned rangeland, oil and gas resources, and other public resources.

Depending on how royalties are collected, care must be taken in determining how much to collect to avoid the problem of killing the goose that laid the golden egg. If too much of the financial gains are taxed away, the incentives to use the resource efficiently will be compromised. This is not a concern with auctions because royalty prices are determined by what bidders are willing to pay to use the resource.

Auctions can provide a number of benefits in limited access programs, including price discovery, guaranteed access to fishing privileges by entrants, efficient initial allocations, and revenue for improved fishery science and management. Councils that incorporate auctions into their allocation systems will need to address two important issues. First, the overall allocation system must result in allocations that meet the requirements of the MSA, including requirements to consider current and historical harvest and other characteristics of the fishing sector. Therefore general auctions open to the general public may be difficult to justify, but forms of restricted auctions may be possible. Second, Councils will need to weigh several factors when choosing an appropriate auction method, because what might work well in one context might not in another.

The exact guidance in the MSA with respect to LAPs, auctions, and the collection of royalties is as follows. [Provide citation.]

- (d) AUCTION AND OTHER PROGRAMS.—In establishing a limited access privilege program, a Council may consider, and provide for, if appropriate, an auction system or other program to collect royalties for the initial, or any subsequent, distribution of allocations in a limited access privilege program if—
- (1) the system or program is administered in such a way that the resulting distribution of limited access privilege shares meets the program requirements of subsection (c)(3)(A); and
 - (2) revenues generated through such a royalty program are deposited in the Limited Access System Administration Fund established by section 305(h)(5)(B) and available subject to annual appropriations.

In addition to auctions, Councils are also authorized to use other programs to collect royalties. Presumably this includes fees on the initial allocation or transfer of LAPs, an annual use fee, or fee based on a percentage of gross revenue above the amount collected for cost recovery.

One important caveat is that any royalties collected under this provision are to go to the Limited Access System Administration Fund, as are the revenues from cost recovery programs. This fund can only be used to cover the cost of administering the central registry system or to administer and implement the MSA in the fishery in which the fees were collected. There are major differences however. Funds collected in cost recovery programs are to be available without appropriation or fiscal year limitation. Funds collected from a royalty program are subject to appropriation.

The bottom line is that while Councils are given the opportunity to collect royalties in a manner that is not subject to the 3% of gross value limitation placed on cost recovery programs, there is no guarantee that the funds will be appropriated for use in the fishery, and if they are, they can only be used as allowed by the MSA.

A second important caveat is that the allocation that results from the auction must meet the specific requirements of the MSA with respect to initial allocations: [Provide citation]

(3) ALLOCATION.—In developing a limited access privilege program to harvest fish a Council or the Secretary shall—

(A) establish procedures to ensure fair and equitable initial allocations, including consideration of—

- (i) current and historical harvests;
- (ii) employment in the harvesting and processing sectors;
- (iii) investments in, and dependence upon, the fishery; and
- (iv) the current and historical participation of fishing communities;

This reservation will be discussed below.

General Overview of Auctions

Because auctions in fishery management are a relatively new topic for Council discussions, it will be useful to provide some background material before presenting the actual guidelines for their use. The first section below explains in broad terms the benefits of auctioning fishing privileges. This is followed by a general description of the things a Council, or more likely, the staff, will want to consider when designing an auction program. The discussion in the main text considers the issues of what to auction and ways of ensuring that auctions satisfy distributional criteria in the Act. The more technical discussions of how to select an auction type and design a specific auction

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format are presented in Appendix 2. To be frank, the discussion here is only a brief introduction. Space does not allow a complete analysis of this complex issue in these general guidelines. Appendix 2 also discusses the use of auctions to allocate other public resources and identifies lessons for the Councils in designing auctions for fishing privileges.

The Benefits of Auctions for Fishery Management

1. Auctions promote an economically efficient initial allocation

Fishing privileges are distributed in an economically efficient manner when they are held by the fishery participants who value them the most. These fishery participants are the ones most likely to harvest fish that consumers value highly and to do so at the lowest cost. These fishery participants also are the ones most likely to submit relatively high bids for fishing privileges in auctions. Auctions therefore promote efficient initial allocations. Trading in fishing privileges on the secondary market also may lead to economically efficient allocations over time as fishery participants that value fishing privileges the most purchase them from others. See the discussion of transferability above.

Even in programs that allow trading, however, auctions may improve economic efficiency in other important ways. First, auctions can help avoid lengthy political battles over formula-based allocation rules. This would speed program implementation and recovery of fish stocks, which benefits fishery participants economically. Second, auctions prevent the ecologically damaging, costly, and potentially dangerous “race for quota” that often develops in anticipation of an initial allocation based on historical catch. Finally, fishery participants that purchase fishing privileges in auctions, rather than receiving them for free, may be more likely to care for the resource to protect their investment.

2. Auctions allow new entrants into the fishery

Initial allocations through auctions give fishery participants without catch histories, including skippers, crew, and fish processors, an opportunity to gain access into the fishery. Annual auctions of fishing privileges can guarantee a steady flow of fishing privileges into the market, ensuring that potential new entrants have continuing access to fishing privileges. Trading of privileges also provides opportunities for entry.

3. Auctions provide price discovery

When conducted transparently, auctions can provide excellent information about the value of fishing privileges, which helps fishermen plan their investments and bankers assess the value of fishing privileges as collateral. Public information about prices also facilitates private trades outside the auction and can aid government monitors in assessing the financial health and status of the fishery.

4. Auctions generate revenue

Auctions generate revenue that can be used for a number of things including paying the cost of fishery management. As explained above, the MSA in its current form puts restrictions on the use of these funds.

Concluding Comments

All of these benefits notwithstanding, auctions will, by definition, allocate harvesting privileges to those individuals with enough money to make the highest bid. There are obviously other criteria by which to make allocations, as is evidenced by the restrictions Congress placed on the use of auctions. But it is important to realize that the individuals who win these types of auctions are not only those with the money but also generally those with a knowledge of, and participation history in, the fishery. Those who know a fishery and have a boat ready to fish are usually able to outbid outsiders simple because the harvesting privileges will be worth more to them.

Basic Principles of Auction Design

Many different auction methods can be used to allocate fishing privileges. This section suggests approaches that are most likely to strike an effective balance among important design considerations.

1. What to auction

There has been considerable discussion on designing the exact nature of the LAP harvest privilege. See the sections on denomination, duration, and eligibility to own above. Councils have a wide range of choice in setting the exact specification of the LAP. For the most part, auctions are fully consistent with all types of LAP design. The auction will just have to be adjusted in obvious ways. For example, LAP programs with unlimited duration will only require an auction for the initial allocation. On the other hand, a program with a five year life will require repeated periodic auctions.

One unifying principle is that the nature of the privilege must be clearly defined so that auction participants know exactly what they are bidding on.

2. Designing an Auction to Meet the Requirements of the Magnuson-Stevens Act

Because auctions allocate fishing privileges to the highest bidders they do not explicitly consider historical catch, employment, investments, and the participation of fishing communities. Councils will have to use modified auction systems to meet the allocation requirements.

LAP Spotlight #10: Georges Bank Cod Hook Sector
<http://www.nero.noaa.gov/nero/regs/frdoc/06mulhook.pdf>
<http://www.ccchfa.org/pages/4/25/>

Vital Stats

First year: 2004.
 Type of DAP: Sector Allocation
 Management units: The Georges Bank Hook Sector, fishing in the Georges Bank Cod Hook Sector Area, an area that represents only a portion of the overall Georges Bank Regulated Mesh Area. Sector has been allocated 10-13% of the total Georges Bank cod Target TAC. Most vessels participate in other fisheries.
 Vessels / Gear types: In 2004, 58 vessels between 23 and 42 feet. Vessels use benthic longline (tub trawl), jigging, or handlining (non-automated).

Available Trend Data

Season length: 8.33% of the Sector's cod quota is allocated to each month of the fishing year. Quota that is not landed during a month is rolled over into the next month. Once the aggregate monthly quota is reached, no Participating Vessel will be authorized to use fishing gear capable of catching species managed under the Plan.
 Ex-vessel value: \$110M (entire groundfish fishery, 2003 data); Sector allocation is approx. 11.5% of the GB cod TAC but only 35% of Sector TAC caught in 2004/2005
 Consolidation: When/if cod recover and the hook sector can catch its TAC, it will have to deal with the issue of its overcapitalization. With the 2004/2005 TAC there are only about 1200 pounds of cod quota per boat per month
 Stock status: Overfishing: YES; Overfished: YES. However, in FY 2004/05 the Hook Sector was allocated 371 metric tons and only landed approximately 130 metric tons (286,190.0 pounds) of Georges Bank cod.

Nature of Harvest Privilege

Eligibility: To qualify for membership in the Sector, each member must possess a limited access permit with Days at Sea and must qualify with landings of Georges Bank cod. Members sign a legally binding contract that commits their vessel and permit to the Sector Agreement for the fishing year.
 Duration: Open ended. Annual Operations Plan must be approved by NMFS after consultation with Council. Council can take action to end the program through the normal Council process. NMFS can withdraw approval of a Sector after consultation with the Council.
 Transferability: Participating Vessels and/or Permits may transfer or lease DAS to other Participating Vessels and/or Permits, provided that the Manager has given its prior written consent to such transfer or lease.
 Accumulation: A vessel may not lease in more DAS than its 2001 DAS allocation. Permanent consolidation of DAS can occur through the DAS Transfer Program
 Initial Allocation: Sector allocation set annually.

Management

Identified Costs: NMFS has estimated annual implementation and monitoring to be \$13,000.
 Cost recovery: The Hook Sector assesses per pound fees to pay for administration costs.
 Monitoring: Members must call or email Sector Manager prior to sailing. Once a Hook Sector member lands a trip, they are required to turn in copies of the dealer report and Vessel Trip Report (VTR) within 48 hours. About 40% has VMS.
 Special Insights:

One way to ensure that auctions meet the requirements of the MSA is to create “carve outs” for auction to particular classes of fishery participants. However, segmenting the auction market in this way could reduce competition leading to low auction revenue and increasing opportunities for auction participants to collude. Councils should therefore consider the full implication of implementing auctions that include artificial limits on competition.

An alternative way for Councils to ensure that the overall allocation system meets these requirements is to withhold a portion of fishing privileges for auction and allocate the remainder by formula using the rules described above. This approach can ensure that the overall allocation system meets the requirements of the MSA no matter how the auction turns out.

Auctioning a fraction of fishing privileges is roughly equivalent to collecting a percentage royalty on the value of fishing privileges, and provides a simple and straightforward way of doing so. For example, Councils that wishes to collect a 50% royalty on the value of fishing privileges could auction half of the fishing privileges. Auctioning a larger portion of fishing privileges will raise additional revenue

In addition to raising revenue, auctions promote economically efficient initial allocations and provide a number of other benefits, as described below. On the other hand, auctioning a large fraction of fishing privileges may diminish the control that Councils have over the overall allocation system and their ability to meet the requirements of the MSA. Councils therefore will want to choose the amount of fishing privileges to auction taking into consideration the requirements of the MSA, the benefits of auctioning a large portion or all fishing privileges, and the potential benefits of using auction revenue for improved fishery management.

Although auctioning a large portion or all fishing privileges may reduce the explicit control that Councils have over who receives the initial allocation, well-designed auctions can be consistent with the allocation requirements of the MSA:

- (1) To the extent that entities with substantial investments in the fishery and high levels of current and historical catch are more competitive, they will be the ones with the highest bids and as such will obtain fishing privileges at auction commensurate with their size and experience. Concentration or excessive limits will guarantee that no single entity obtains too many fishing privileges.
- (2) Auctions that permit broad participation provide opportunities for all fishery participants to obtain fishing privileges, including vessel owners, skippers, crew, and fish processors.
- (3) Low bidders that do not receive fishing privileges initially can buy fishing privileges on the secondary market. Secondary market prices and auctions prices should be closely related, so that those who are unsuccessful at auction should not be significantly disadvantaged relative to those who are successful.
- (4) Although the precise allocation that results from an auction can not be known in advance, the allocation may be less susceptible to controversy than allocations based on historical catch and other factors. The market rather than political decision making will determine who gets the privileges.

3. Basic types of auctions

The fundamental goal of an auction for fishing privileges is to sell a fixed number of identical items. Each auction approach must specify how a participant bids and the rule for deciding who wins and how much each winner pays. Some approaches have a single round and others have multiple rounds. Sometimes there are tradeoffs among the simplicity of the auction, the economic efficiency of the allocation that results from the auction, and the amount of revenue the auction raises. Since this goes somewhat beyond the topic of LAP program design, these topics are treated in Appendix 2.

D. Alternative Methods for Collecting Royalties

Besides auctions, Councils are authorized to use other methods to collect royalties. Such programs separate the royalty collection issues from the initial allocation issue. This section describes several different approaches to collecting royalties and discusses some of their benefits and drawbacks.

1. Per-unit fee assessed on allocations

Perhaps the most simple and straightforward way of collecting royalties is to assess a fee annually on every unit of fishing privileges.⁵ Fishery participants that hold more fishing privileges would make higher royalty payments overall. Fishery managers could determine the fee just prior to the fishing season or even several years in advance. Fishery managers could choose the level of the fee to target a specific amount of revenue. Alternatively, fishery managers could choose the level of the fee to equal a percentage of the value of fishing privileges. Finally, fishery managers could choose the level of the fee to equal a percentage of the average value of harvested fish over some historical period.

Per-unit fees assessed on allocations have several benefits. They can be implemented easily at low cost. They provide a predictable revenue stream. Making the allocation of annual fishing privileges conditional on payment would give privilege holders an incentive to pay their annual fees. One disadvantage of per-unit fees assessed on allocations is that, unlike auctions, royalty levels do not adjust automatically to changes in the fishery, and fishery managers will need to adjust fees periodically as fishery conditions change. Finally, fishery managers should choose the level of the royalty fee carefully, because if they set it too high privilege holders might choose not to fish at all. Auctions do not suffer from this problem, because royalty prices are determined by what bidders are willing to pay.

⁵ Although Councils could assess a per-unit fee just once on the initial allocation of fishing privileges that last the duration of the limited access program, the benefit of an annual fee is that it can be adjusted to reflect changes in the fishery or changes in the amount of revenue that is necessary to fund the LAP program. Programs that collect royalties just once may put NMFS in a situation where they require more revenue but have no means to acquire it.

2. Percentage fee assessed on the landed value of harvest

Another method for collecting royalties is to assess a percentage fee on the landed value of fish harvested. This is the method that is mandated in cost recovery programs. It is similar to a per-unit fee on allocations where the level of the fee is set to equal a percentage of the average value of harvested fish over some historical period, but differs in that royalty payments are determined at the end of the fishing season or at the time of landing rather than before the season begins.

The advantage of a percentage fee assessed on landed value is that royalty payments adjust automatically to changes in the quantity of fish landed and the market prices of fish. The flip side of this benefit, however, is that a fee on landed value results in a fluctuating and uncertain revenue stream.

Another disadvantage of fees on landed value is that they might distort behavior away from what is economically efficient. For example, because fees increase with the price of fish, they will impact harvesters that typically sell their catch in high-price markets more than harvesters operating in low-price markets. Depending upon the level of costs, in certain cases this could affect incentives to find higher priced markets for fish. Auctions and per-unit fees on allocations do not distort economic behavior in this way. In addition, a fee on landed value can be costly to administer, because fishery participants need to keep track of harvest quantities and prices, and fishery managers need to monitor that these quantities and prices are reported accurately. Fishery managers could reduce costs by valuing all harvested fish at the same average market price. In contrast, auctions of privileges generate revenues based on how much bidders expect to profit from harvesting fish.

3. Fees assessed on transfers

Councils are discouraged from assessing dollar or percentage fees on transfers of fishing privileges as a means of collecting royalties. Likewise, Councils are discouraged from charging percentage fees on capital gains (i.e., sales price minus purchase price) that result from transfers of fishing privileges, although such gains would be reportable on traders' income taxes. Although there may be some justification for charging a nominal fee on transfers to cover the incremental cost of updating and maintaining a database of privilege holders, large transfer fees would discourage economically beneficial transfers and reduce the efficiency of the fishery. Moreover, royalty revenues would depend crucially on the number of trades that occur in any given year and therefore would be highly variable.

3. Design Interrelationships

The above material has presented information about the various components of a LAP program. While there were frequent references to the interrelationships between specific components, a more focused look at these connections will prove useful. The discussion can be facilitated by using Figure 3. The different components discussed above are listed

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in the rows and columns of the box. An X in the different boxes indicates that an interrelationship exists. The significance of the relationships for each of the columns will be discussed below.

Before turning to the analysis, review the meaning of these comparison boxes. First the dark boxes on the diagonal are not relevant because they represent a comparison of a component with itself. The question that will be posed for the rest of the boxes is as follows. Will the choice of the component indicated by the column name affect the choice and operation of any of the components represented by the rows? What is interesting is that the comparisons will vary depending upon the row and column. For example, the choice of transferability options can effect duration but the choice of a duration option had no direct effect on transferability. This will be discussed in more detail below. Finally, for purposes of these comparisons, there is not much difference between formula based allocations and auction allocations, but both are included for completeness.

A few introductory remarks are in order. First in some cases the design or the operation of two components will be related. In other cases the design of one component will have a significant effect on the operation of another. For the most part, however, the gradations in both cases are sensitive to the specifics of the particular fishery, and it is not that simple to make general conclusions at this level of analysis. There has been no effort to create a more discriminating ranking system (i.e., one star represents a slight relationship and four stars represents a significant effect), but the nuances which tend to determine the type of relationship will be discussed.

	1. Specification of Management Unit	2. Denomination of LAP Unit	3. Eligibility to Own	4. Duration	5. Transferability	6 Excessive Based Share	7. Formula Based Allocations	8. Auction Allocations
1. Specification of Management Unit								
2. Denomination of LAP Unit			x					
3. Eligibility to Own	x							
4. Duration					x			
5. Transferability	x	x	x			x		
6. Excessive Share	x		x					
7. Formula Based Allocations	x		x	x	x	x		
8. Auction Allocations	x		x	x	x	x		

Figure 3

There are several ways the components can be related or can affect each other. The connections may be related to the ease and effectiveness of implementation, monitoring, and enforcement. In some cases the way one component is set up in juxtaposition to another can affect the way in which certain management objectives can be achieved. Finally the interrelationships can affect the economic efficiency of harvesting, processing, and marketing. This is really an extension of the previous discussion. Not only can the choice of a particular option for one particular component have an effect on these three things, but there are interconnections between different options for different components.

The remainder of this section will provide a discussion of possible connections between various components by looking at each column one at a time.

Specification of the Management or Resource Unit

The basic issue with the specification of the management unit is the number species, stocks, and/or stock aggregations to include in the plan. As pointed out above, the more species involved the more complex the plan. On the other hand, omitting stocks when they are biologically or technologically related to included stocks can cause a myriad of problems.

This can be connected to the eligibility to own and the allocation components in several ways. In the first place, increasing the number of stocks will likely increase the number of entities that have worked with an included stock and hence are potential participants in the LAP fishery. Further as more and more marginal stocks are included, the range of historical activity of the participants could vary widely. It will likely be quite difficult to develop an allocation programs that is perceived as fair when there is a large number of heterogeneous potential participants. It may require many sub-categories and/or special cases which will make tracking participants quite difficult.

On a more a more practical basis, the quality and length of the historical catch records may vary over the different types of fish. It may be harder to establish who is more deserving of being included. The extreme case would be where a fish stock is included to address by-catch issues or ecological relationships, and yet it has not been harvested to any real extent. These are problems that can be overcome, but it will not be easy. Finding a logical system will be big challenge in and of itself, and the many different views on distributional fairness will make it even that much more difficult.

The issue of transferability is also closely related to the specification of the management unit. For one thing, if the related species are caught together, participants will have to keep a portfolio of AHP for the different species that will match his/her catches. It is almost certain that it will be necessary to allow transferability to allow this to be accomplished. In addition, it may be wise to set some rules that may not be necessary elsewhere. For example if two species are usually caught together in certain approximate ratios, it may be wise to require trades to occur in bundles with those proportions. The exception would be if the purchaser could show his/her portfolio had sufficient AHP to match the proportions.

The excessive share issue can also be more complex according to the specification of the management unit. An expanded plan may increase the potential for market power excessive share. Ten percent of the quota share for the fishery for a single stock may grant no market power because there is so much competition from the products of other similar fisheries. However, ten percent of the total quota share for a group of fisheries in an area managed together may be sufficient to affect price.

The problem with management objective excessive share is more complex. The more species and stocks that are included in the LAP program, the greater will be the chances that the transition associated with the new program will result in reorganization and realignment of harvesting, processing, and marketing patterns that run counter to management objectives. In those instances, it is important that the management objectives are well thought out and that the potential effects from transition are fully considered.

Denomination of LAP Unit

The issue here is whether the LAP permit will be based on a percentage of TAC (the IFQ) or a portion of the TAC (the LAP). This will affect transferability if both types of permits are used simultaneously; IFQs for traditional recipients and LAPs for RFAs and FCs. There will be complications calibrating exchange rates between percentages and portions. One way to prevent the problem is to prevent transferability between the two types of permits. And the problem will not exist if either one or the other type of permits is used. Further it will be significantly reduced if the LAP portion of a dual program uses a cushion system.

It is worth repeating that in the received wisdom around the world in using LAP program is that issues quota shares as a percentage of the TAC is the most prudent way to go. Nonetheless the option to use a portion system is available. Councils may find that assignments in terms of fixed tonnages make sense for certain entities such as FCs to provide them with an extra measure of stability. If the TAC falls, prudent management will necessitate that total permissible harvest is reduced, but that reduction does not necessarily have to come out this tonnage catch privilege. The privileges of other participants could be forced to take all or a greater percentage of the hit. The flip side holds as well. If the TAC goes up, the management authority retains the option to choose how the extra privileges will be distributed.

For purposes of discussion, consider the implications of transferability between the two types of permits. If stock size and hence the TAC, is not likely to change very much, there will likely be little difficulty. Assume a person with an IFQ permit buy a privileges for 50 tons of harvest from a person with a LAP permit. If the relatively constant TAC is 1000 tons, there would be no biological implications from letting a transfer that represents a 5% QS in the IFQ program. And more to the point, if ten years later a similar trade was made in the opposite direction, a 5% IFQ QS could be transferred to a 50 ton LAP QS with no adverse effects.

However, things will not be so easy for fisheries undergoing a stock rebuilding program or where relatively large changes in the TAC can be expected. With a current TAC of 1000 tons, consider a sale of 5% QS from the IFQ program to that ends up as a 50 ton QS in the LAP program. The new owner has more harvest privileges and they are protected against TAC declines. However, if the TAC goes up, the LAP owner will not directly benefit without direct management action. Consider the reverse sale in the same situation. An IFQ permit holder buys 50 ton of LAP QS, which is transferred to a 5%

IFQ QS. When the TAC goes up, technically that 5% share will be translated in extra AHP. The 50 tons is effectively translated to 100 tons. Now what happens if this second sale is reversed? The IFQ permit holder will be able to sell 5% of the QS but it will be translated into 100 tons of LAP QS. If biological conditions revert to the status quo, the individual will now have 100 tons of protected harvesting privilege where before they only had 50.

Consider comparable sales in situations where the TAC falls. A sale of a 5% QS share to a LAP permit holder will generate 50 tons of LAP QS. A variable share has been translated into a, at least partially, protected share. If the TAC falls, the LAP permit holder will be able to maintain the 50 tons, and the harvest reduction hits may be imposed elsewhere. A trade between two participants may end up affecting other participants if total harvest must be reduced. This sort of thing will not exist in a percentage based system.

A sale from a LAP permit holder to an IFQ permit holder will result in the reverse situation. For the amount of the sale, the reduction in TAC will be taken from the IFQ permit holder on a percentage basis. There will be no discretion to lower harvest privileges elsewhere as would have been the case had the sale not occurred.

While it would be possible to discuss other hypothetical situations, for purposes here it should be clear that allowing transferability between IFQs and LAPs will allow for a number of biological and distributional problems. It will be necessary to develop the specific transferability rules that take consideration of these connections.

Eligibility to Own

The specification of eligibility to own criteria will have a direct bearing on the design of other components. Some are quite straight-forward and will follow from simple LAP programs. For example, the initial allocation procedure will have to be designed to ensure that entities that are not eligible do not receive QS. Further the transferability rules and trade approval processes will have to ensure that non-eligible entities do not acquire QS or AHP through market trades.

There are some other rather more subtle issues dealing with the introduction of RFAs and FCs. One has to do with the denomination of the LAP unit. Since the concept of the LAP based on a portion, rather than a percentage, of the TAC, and the possibility of using RFAs and FCs were introduced together in the most recent reauthorization, Congress presumably felt that allocating permits based on a portion of the TAC would potentially be better for these organizations than traditional IFQs. So if nothing else, it may be necessary to select the denomination type taking into account what will work best for the types of entity that will receive the quota share.

For example, as discussed above, Councils may feel that FCs, and perhaps certain types of RFAs, will be better suited to meet management objectives if their harvesting privileges are more protected. That is, in case of TAC declines, Councils may feel that

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they do not want to rely on mandatory percentage cuts. They may desire the option to structure the necessary cuts in some other fashion. Similarly, they may want the option of being able to allocate increases in TAC so that more of the increase goes to specially selected entities. Apparently these options are open given the language of the reauthorized MS. Two things should be clear however. First, going to a portion based QS does not in any way do away with the absolute necessity of keeping the allowing harvest at or below safe biological levels. When the TAC falls, cuts in allowable harvest will be necessary. The discretion will be on who takes the cut, not on whether the cut will be taken. Second, allowing for discretion in the way changes in the TAC are reflected in changes in the AHR of different entities will lead to very difficult and costly political negotiations, as well as the possibility of litigation.

The percentage based system has certain advantages. It is simple to operate, transparent, and likely to be view as more fair. It also provides more of the incentives that are the basis for using LAPs in the first place. The harvesting privileges of all participants are more secure which will provide incentives for both biological sustainability and production efficiency. Councils should take a hard look at the pros and cons of choosing either a percentage or a portion based program.

The use of RFAs or FCs will also affect the criteria to define management objective excessive share rates. One of the notions behind these organizations is that groups of fishery participants, especially if they are from different sectors, will be able to make fishery operational decisions that will be mutually beneficial to all. Or at least they will make decisions where the effects on all participants are taken into account. As such, it may be permissible, or even desirable, for such organization to control a larger portion of the outstanding QS. One purpose of setting management objective excessive share limits is to ensure that one entity can not adversely affect other participants. Since a wider group of participants may be involved in RFAs or FCs, the concern for this happening may be less.

The eligibility to own component can also be related to a “yes or no” decision on transferability. With respect to RFAs and FCs, Councils will have to decide whether transferability between either RFAs or FCs, or among RFAs, FCs, and other entities, and if so, in what direction, will help or hinder the achievement of management objectives. The same sort of decision may be necessary even in a traditional IFQ where there are different types of participants who use different types of gear or work out of different ports. This is discussed in more detail in the section on transferability above.

Duration

The choice of a duration component can have definite effects the allocation component. If a LAP program is designed with a limited duration it will be necessary to set up a continuing allocation system. In the extreme case, if there is an absolutely fixed duration, then the whole program, including the allocation procedure, will have to be redesigned to continue with a LAP program. In more subtle cases, where there is set date for a review and continuation decision, it is necessary to specify how the harvesting privileges will be

allocated if the system continues. The possibilities range from the current allocation, to reallocation among current participants based on performance criteria, to redesigning the whole program. When setting a duration limit, the repercussions on the need for a continuing reallocation process should not be overlooked.

Transferability

As with duration, certain choices in the transferability component will have effects elsewhere. If transferability is not allowed, barring any reallocation, the duration of the overall program will be as long as oldest surviving participant. The program will decrease in size as individual participants are eliminated. If these are corporate entities rather than individual human beings, the issue is somewhat muted.

Of course the real issue is that, in addition to its negative effects mentioned above, non-transferability will require a continuing process of re-allocation to keep the program going. Presumably, the initial recipients will include a large percentage if not all of the active participants in the fishery at the time of program design. It may be possible to restrict future re-allocation to this pool of active participants, at least for a while. However, this may lead to problems with excessive share.

And over time, the pool of active participants may be significantly reduced. This leads to another problem. The law stipulates that harvesting privileges must be allocated to entities that significantly participate in the fishery, and this is true even if auctions are used. It may not be possible to develop reallocation procedures that are consistent with the MSA.

As discussed in detail above, the initial allocation process can be very difficult to design properly even in the best of cases. The main point to be made here, is that it may be just that more difficult if the LAP program does not allow for transferability. Councils should fully consider these ramifications.

Excessive Share

The selection of an excessive share limit has an obvious and straightforward implication on the transferability and allocation options. First, the allocation program must ensure that no one participant receives more QS than is allowed by the excessive share limit. Second, the transferability rules and trade approval processes will have to ensure that no participant will be able to surpass the excessive share limit by acquiring QS or AHP through market trades.

Allocation Procedures

While an allocation procedure may have to be designed in a special way to be consistent with the way other components are selected, the a priori choice of a certain type of initial allocation method will not set any limits on the way the other components are selected.

PART 3: Other Aspects of LAP Management

The purpose of this document is to assist Councils as they design DAP programs. However, as they are developed and implemented, there are certain things that Councils do, and there are certain things that NMFS does. For the most part, the Councils design the programs while NMFS approves, implements, and monitors them. There is a range of choice in the first task, while there are accepted practices for doing the second task. However, with respect to some aspects of LAP programs, especially those provided or mandated for the first time in the recent reauthorization, have yet to be fully developed. While consultation with the Councils is common for some aspects of implementation and monitoring, other aspects are done solely by the agency.

The previous section covered the task of designing a LAP program. This section will briefly discuss some of the tasks related their implementation and operation. It is provided as a background for the Councils as they design programs. The idea is that they will be able to do a better designing job if they understand the issues of implementation and monitoring.

1. Enforcement

Introduction

A principal goal of any fisheries enforcement program is to change human behavior and encourage participatory obedience so as to obtain acceptable levels of compliance with the regulations that are promulgated to support plan. In the publication “Sharing the Fish,” by the National Research Council [citation], the importance of LAP monitoring and enforcement is addressed as follows: “regardless of how well any fishery management plan is designed, noncompliance can prevent the attainment of its economic, social, and biologic objectives. Plans containing LAPs are no exception.” Without regulatory compliance, any fishery management plan will fail to achieve the desired results.

Looked at from the other way, when the regulatory parameters exceed the capacity of law enforcement officials to achieve an acceptable level of compliance, that plan becomes threatened. But there are two sides to the equation, both of which are matters of policy. The most obvious is the capacity of the enforcement officials. Theoretically that capacity can always be increased. Hire more people and give them more resources! However, there are budgetary limits and there are also limits on what the workers and the resources can actually accomplish. The other side of the coin is the nature and complexity of the management program and the rules and regulations that are necessary to implement it. An important theme of these guidelines is that LAP programs should be designed to be as simple as possible while being able to achieve the management objectives. Simplicity is beneficial to the everyday working of the plan but it is also important with respect the balance between enforcement costs and enforceability.

With LAP programs it is important to realize that it is not just the actual monitoring of catch that is important. Given the nature of the system, there are a range of institutional structures that must be set up and a number of tasks that must be performed prior to or as a condition of the monitoring of catch. The most important is the registry of ownership of the LAPs which must be capable of annually issuing the proper amounts of annual harvest privileges (AHP) for each unit of quota share (QS) and of keeping track of trades in both QS and AHP. Also there is the whole record keeping system to balance landings against AHP. See below. These can be quite expensive to build and to run, and these costs will vary directly with the complexity of the LAP program.

Frequently Councils consider LAPs as an alternative to a struggling fishery plan which encompasses a downward trend in stocks, sinking economical viability, social skepticism and escalating levels of non-compliance; all four elements serving to undermine fishery management. By comprehending the underlying causes of non-compliance in the previous fishery plan, law enforcement experts can identify, control and eliminate factors which foster unlawful behavior, potentially threatening to the new LAP regime.

In troubled fisheries the cause of non-compliance, and the attending ills, can often be traced to management controls which serve to alienate the participants and create economic incentives to cheat. This is not an obvious or deliberate process. It can occur over a period of years or even decades depending upon the market conditions. As a fishery “heats up” managers attempt to control the harvest by controlling effective effort with management tools which are well established but ineffective against socioeconomic and market forces. Typically, a troubled plan moves from open access to limited access, from a full fishing season to fishing a limited number of days, from full fish holds to trip limits, moving ever closer to what is now called a “derby fishing”.

Lost in this evolution is the notion a fishing boat as a business and a business exists to make a profit. As such, even fishermen who once might have been supportive of the intentions of management become disenfranchised as the newer restrictions begin to cut into their profit margins. As fishing days are cut and trip limits reduced, marginal fishers are forced to the economic fringe where they face the unpleasant prospect of violating the law or having their families go without. However, as time passes and the more stressed the fishery becomes, the more stringent the regulations. More fishers are forced from mainstream profitability toward the fringe of economic survival.

This cyclic effect, which is different for each participant based upon his/her fishing ability, is the underlying rationale for most non-compliance. There becomes a point in the management process when competing interests develop between participants who want to stay in business and the management process which needs more aggressive regulations to ensure over-fished stocks recover.

Fisheries researchers world-wide have shown that when stringent government regulations adversely impact fishermen to the point of distress, it is seen as morally acceptable within the fleet to violate the law to “make ends meet.” Law-abiding fishermen are reluctant to report errant colleagues under these circumstances because of the widespread belief the

“government is trying to put them out of business.” When this level of non-compliance is pervasive, law enforcement officials can detect and apprehend violators but cannot curb the rate of non-compliance. With each successful apprehension by law enforcement officials, experienced violators change their modus operandi to make detection more difficult. Others reluctant to join at first will be pulled in as it becomes socially acceptable and profitable to cheat, and the probability of detection diminished. Certainly, there are some who will comply no matter what. Usually these are leaders in their respective fishery, highliners, and those totally invested in the outcome. However good their intentions, they cannot offset the rising magnitude and scale of regulatory non-compliance in the fishery. At some undetermined point, the degree of lawlessness exceeds the capacity of law enforcement officials to change social behavior and the plan slowly spirals out of control.

LAP Enforcement Operations

While the institution of a LAP program will not change the mindset of industry participants, it can over time have a favorable effect on the way they view the enforcement system. For one thing, it will eliminate the race between the Council and the individual fishermen where the Council makes a move to control their activities or catch levels, and the fishermen make counter moves to maintain or increase their ability to take fish. For another it limits the way the management system can affect a given entity. With a LAP program, a change in the TAC will change the annual allowable harvest of all participants and they will be affected proportionally with IFQs and in a known specified way in more general LAP programs. In non-LAP programs individuals can be hit with a range in input and output restrictions, which can have differential effects depending on the type and size of fishing vessel, individual fishing habits, and relative fishing skills. Finally, because individual owners have a long term interest in the health of the stock, there are more incentives abide by the fishing rules and to cooperate with enforcement officers with respect to the activities of others.

At the core, the enforcement issue in a LAP program is to annually ensure that each participant does not harvest more than is permitted by the total of his/her accumulated AHP, that amount being the sum of that generated from his/her QS plus or minus any changes from trades. If that is accomplished, total harvest in the fishery will be less than or equal to the TAC. By the nature of the system, the enforcement is best done by accountants in green eye-shades and not by fish cops watching the when, where, and what of fishermen’s activities. The main enforcement procedure is a double entry accounting system under which routine audits can detect illegal landings (landings that are not backed up by AHP) and unlawful downstream fish sales (sales that are not backed up by documented legal landings.)

To be more specific, the success of a LAP program rests entirely upon the ability to track the owners of Quota Shares (QS), allocate the appropriate amount of Annual Harvest Privileges (AHP) that flow from the QS, reconcile landings against those AHP, and, ultimately balance the collective figures against the total allowable catch (TAC). If this can not be accomplished, both illegal landings and unlawful sales will be possible which,

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more than likely, will eventually destroy the program. These violations not only undermine management goals and objectives they also erode the very foundation of quasi-privatization which is a core concept of LAPs. If the participants lose confidence in the government's ability to manage the program, the LAP will fail.

It is in the marketing of fish where traditional fishery regulations and LAP programs converge. While many things may change, what remains constant and intact is the commercial aspects of the fishery- the entire commercial and economic superstructure- including any black markets. To market legal or illegal fish requires the commercial involvement of others, e.g. dealers, wholesalers, purchasing agents for restaurants, the general public and the like. For example, fish from a traditional plan were harvested out of season and proper record-keeping and landing reports were filled out, it would immediately draw official attention to the perpetrators. The successful movement of illegally harvested fish requires surreptitious transactions, often co-mingled with legitimate product and paperwork, as a means of avoiding detection. This is why a LAP program requires a double entry accounting system.

The fundamentals of the required monitoring/enforcement procedures can be described heuristically in terms of Figure 4. For simplicity, it is assumed that there are only three harvesting participants and three processors or fish receivers. Level 1 shows the registry of ownership of QS. It is necessary to track who owns it which means being able to track sales from one participant to another. The more limitations on who can own and who can trade with whom, the more difficult and expensive it will be to run the registry

Level 2 shows the actual harvesting part of the system. Harvesting is authorized by the AHP which are generated by the ownership of QS. Recall that while QS has traditionally been denominated in percentage points of the TAC, AHP is denominated in terms of pounds of allowable harvest. The exact amount will depend upon the percentage points owned and the size of the TAC. If allowed, once the AHP are distributed, they can also be traded. Enforcement officers must be able to keep track of individual balances after such trades. Those balances represent the amount of fish that each participant will be allowed to harvest.

Level 3 shows the fish receivers. If a LAP program is to work, all entities that act in that capacity must be licensed and must keep appropriate records of all transactions. The most important part of a LAP enforcement program is a double entry bookkeeping system between harvesters and fish receivers. Every time a harvester brings in a load of fish, the transaction is marked by the name and number of the harvester, the name and number of the fish receiver, and the amount of the sale. The transaction must be recorded with the NMFS enforcement branch, after which, the amount of harvest will be subtracted from the harvester's AHP account. The harvester will not be able to complete any more landings transaction when his/her AHP account is emptied. As a double check, at the end of the year, the records of all fish receivers can be collected and summed across harvesters. The total recorded landings can then be checked against the AHP available to each participant. If all participants are within their permitted level of AHP, the total catch will be within the TAC.

In addition the total purchases of any one fish receiver can be checked against the amount of their sales on down the product line. If they are selling more than they are legally buying, they will be out of compliance. If fish receivers know this, they will have every incentive to make sure they can prove all of their purchases are legal. They will not be tempted to buy fish off the record from harvesters.

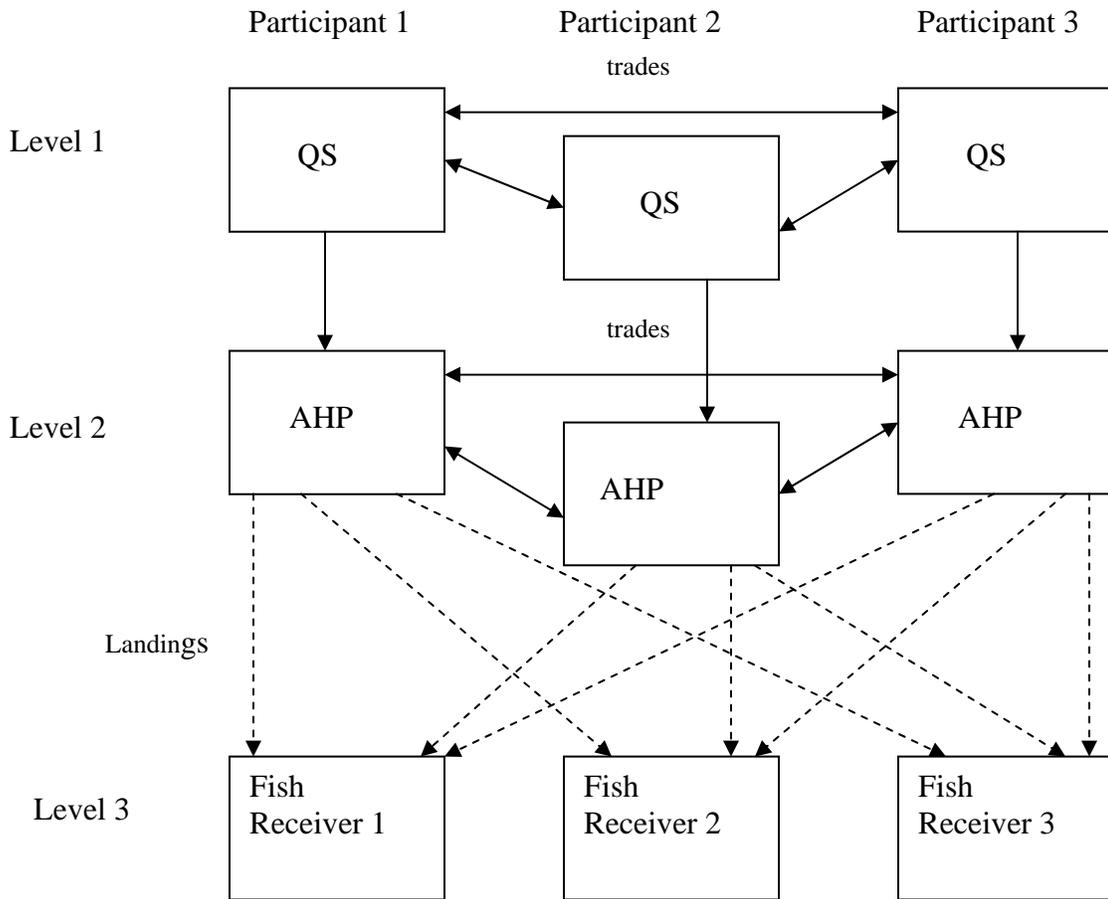


Figure 4

A LAP checks and balances system need not be more difficult than the average on-line banking process. A bank account is opened with a deposit. As more checks are written the account is debited and the balance is continually reduced. Without additional deposits the balance in the account will eventually reach zero. LAP electronic accounting provides an analogous service. The difference is that NMFS is the “bank” and oversees all electronic transactions. Electronically accounting for annual allocation expenditure with the landing of catch and reconciliation with the TAC using a checks and balances system is the best assurance that illegal landing and unlawful sales do not take place.

The optimum method of uncovering and identifying illegal product in commerce is through the use of a “paper-trail.” A LAP program can ensure the identification of legal product by incorporating a few additional accounting procedures. First, all purchases by LAP qualified i.e. licensed or permitted LAP dealers, is tracked through an account just like the LAP fishers. Unlike the fisher’s account which tracks annual allocation expenditures at the point of sale, the dealer’s account tracks the amount of fish purchased and from whom. Obviously, these two accounts should balance. The monthly totals of the dealers account can be used to estimate the amount of cost recovery fees owed; the amount of fish purchased by a single dealer; the total amount of fish purchased by the dealer against individual landings and compared with the TAC and so forth.

The use and tracking of dealer accounts is a critical component in the checks and balance system. Law enforcement officials who audit fish plants will have an up to the moment account of fish purchases by the LAP licensed or permitted dealer greatly facilitating and enhancing the audit process. Another essential function of the checks and balances system is to provide an approval code for every purchase which can easily be generated for each reported landing. The approval code should be required on all shipping documents, purchase orders, bills of lading and manifests whether the code reflects one fish or the entire load. This enables an NMFS agent in another region to easily determine whether the fish for sale in the marketplace falls inside or outside the LAP. If the paperwork does not show an approval code then the product is either imported or illegal. If it is imported, there will be U.S. Customs and foreign documentation available by the dealer. If no documentation of any kind exists there is a strong probability the fish were harvested, transported, and marketed illegally and an investigation ensues.

To summarize, the following are necessary parts of a LAP monitoring program:

1. All landings are recorded immediately upon offload
2. Participants and Dealers have separate PINS
3. Participants and dealers have separate accounts tracked by NMFS
4. Participants can transfer annual allocations electronically
5. No transaction is complete without an NMFS approval code
6. The approval is required on all transportation and sales documentation

In some cases, the system can be improved by creating an overage system where a LAP fisher is permitted to have a 10% overage on the last landing without sanction. The overage amount should simply be docked from the following year’s annual allocation. The other part of this is that LAP licensed or permitted dealers can purchase fish overages with the approval of NMFS and without possibility of sanction. The use of the 10% overage eliminates the potential of the law enforcement program getting wrapped up in numerous cases involving small amounts of fish.

Second Lines of Defense for the Double Entry Accounting System

Ideally, the double entry accounting system will provide all the monitoring and enforcement activity that is necessary. If routine audits can locate situations where fish are landed that are not backed up by AHP or where final product is sold that can not be

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backed up by a documented legal landing, these activities can easily be identified and the appropriate punishments can be doled out. What is more, if fishery participants know illegal landings or unlawful sales can be identified, they will have no incentive to undertake such activities. But things do not always work this nicely, especially when the landings from LAP programs run through the same landing and processing channels as those of non-LAP programs. For example, sometimes it is possible to pass off the landings or the final product sale of a LAP fishery as being from a non-LAP fishery. The illegally harvested fish is co-mingled with legally harvested fish and the entire load is sold in local, intra-state or inter-state commerce as a legal product. To do this requires accomplices who agree to illegally purchase and transport the fish. More importantly for purposes of discussion here, violators fail to file required record keeping and reporting requirements. Falsifying records to conceal illegal landings protect those involved in the collusion to escape detection. These reports are essential for monitoring the existing TAC and for help in determining next year's TAC and quota allocation.

A possible second line of defense is to require a robust, shore-based, real-time data reporting and monitoring program. The shore-side, real-time data reporting begins with a prior notice of landing (PNL). This typically occurs 3-6 hours before the vessel is moored. When the PNL is made, it should require identification of the operator and the quota-share holder aboard, if different. Also required are holder's permit number, vessel name and number; species targeted; estimated catch aboard; destination for off-load (and whether they will deliver to more than one LAP (licensed or permitted) dealer as well as the approximate time the vessel will be in port. This is a final opportunity for the permit holder to "self-report" if they know they have more fish aboard than quota to cover the landing.

Once they have made their PNL and declared their catch aboard, an officer has approximately 3-6 hours to meet the vessel dockside and monitor the offload. Offloads must occur during an "offload window" usually 0600-1800. An offload window ensures the dealer will be open and an enforcement officer will be present. In the event an offload monitoring is required, it must be monitored to completion and the hold checked to ensure no fish remain. Twenty-four hour offload windows are inefficient and only serve to drive up enforcement costs of the LAP needlessly. In fisheries where more than one LAP species can be harvested and retained monitoring becomes a bit more complex but is sorted out dockside as the fish are placed in totes and weighed.

Fishing vessels may elect to leave the management area for a destination outside the boundaries of the LAP management regime. If this is going to occur, the vessel must request "vessel clearance" and proceed to a mutually convenient port to have the catch examined by a law enforcement officer, who will grant final permission for the vessel to leave the area (or the country). LAP programs are shore-based systems and as such, at-sea evolutions such as transshipments must be prohibited if the LAP is to be enforceable.

Once the catch is landed and offloaded to a LAP licensed or permitted dealer and the catch is sorted; measured/weighed and valued prior the data is entered into electronically into the third side of the pyramid: the checks and balance system.

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To summarize, the following are necessary to minimally support real-time data reporting:

1. Prior Notice of Landing (usually made 3-6 hours in advance)
2. Offload Windows (usually 0600 to 1800)
3. Vessel clearance (when vessel leaves management area)
4. For the most part transshipment before landing should be prohibited, although there may be special fisheries where it could be allowed.

Another tool that can be used in tandem with a real time data reporting system is to require a vessel monitoring system (VMS). VMS is an essential requirement to show the vessel was at-sea, how long it was out, where it docked when it came into port and the present vessel location. VMS is capable of understanding and recording small details of the ship's evolutions. It can document, for instance, specific course changes and engine speed changes by a vessel. Collectively this pattern is termed a signature. At present there is not enough data to make a signature admissible in court as an indicator of fishing. Regardless, VMS technicians are trained to look at positioning data and other factors indicating potential fishing activity. An investigator can be dispatched to the landing site intercepting the vessel as it comes into port or even anchors in a remote area. If the captain and crew are believed have illegally harvested a LAP species, the agent or officer can intercept the vessel. If, during the course of an initial investigation, a violation surfaces the agent or officer will bring the vessel to port, seize the catch and cite the errant fishers.

In summary the following conditions are necessary to minimally support a LAP-VMS program:

1. All participant vessels are equipped with NMFS authorized VMS units
2. The system must be operated 24/7 for 365 days a year.
3. Fisher must present documented proof VMS is fully operational prior to receiving annual allocation
4. Participants agree to return to port if VMS is dysfunctional as a condition of participation
5. Tampering with the VMS or power source supporting VMS must be prohibited.

Using all parts of the enforcement program including the double entry reporting system, real time monitoring of landings and monitory and VMS, it is possible improve enforcement by profiling for possible non-compliance. The complete system can collectively and simultaneously monitor vessel activity, fishing activity, landing ports, fish sales and dealer reports. From all this electronic information harvest tracks and trends emerge. Vessel and fishing activities that do not conform to normal commercial patterns will draw the scrutiny of officials. A comparative analysis between VMS track-lines, landing activity, landing reports and dealer reports will determine if further investigation is warranted. If the analysis is inconclusive or information indicates a probable violation the fisher, vessel and dealer are placed on a list to be immediately

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contacted by law enforcement officials. The vessel is intercepted, boarded and checked. The dealer plant is inspected and electronic data files are audited. Based upon the results of this information, the initial activity drawing the attention of officials in the first place suggests that: 1. A violation is probable and an investigation ensues; 2. A violation did not occur and the activity is explained; and 3. The result is inconclusive and both the fisherman and dealer are placed under scrutiny.

Concluding Comments on Enforcement

The above is a brief summary of the basics of the design and operation of an enforcement program for a LAP managed fishery. As with other aspects of fisheries management, the Devil is in the details. While, for the most part, Councils will not have direct responsibility for these activities it is important that members and staff understand what needs to be done. For one thing, clear communication during the construction of the plan will help to ensure that the peculiarities of the fishery which might affect enforcement are known to NMFS and that the nuances of enforcement that might affect compliance in a particular fishery are known to Council members.

At the end of the day, however, it will be a team of professionals from various NOAA Fisheries offices that design the actual system and make the determination of what second lines of defense will be necessary to back up the basic double entry monitoring system.

It is important to stress that while the simple diagram in Figure 3 can provide a heuristic picture of what must be done in a LAP monitoring program, the details can be very complex indeed. Also, there is likely a linear relation between the complexity and the costs of implementation and operation of a system, and also its ability to actually get the job done. Councils should keep this in mind as they design the details of the LAP program. This is not to say the best plan is the one that has the lowest enforcement costs. The best plan is the one that gets the job done (where success is defined meeting the demands of the MSA and accomplishing the management objectives of the plan) and doing so in the most efficient manner. If there are two ways to achieve a management objective, all else equal, choose the one that costs less to implement and enforce.

It is important to recall that the cost recovery provisions of the MSA place of cap on recovery of 3% of the gross value of annual receipts. While the costs of enforcing the Halibut/Sablefish program are under that cap, it is not clear that this will be the case for all future LAP programs, especially those with smaller TACs and lower market prices. While the logic of efficient use of enforcement funds holds regardless of the 3% cap, it is especially compelling where enforcement cost will be above the cap. In times of limited funding, it may be difficult to find the necessary funds.

It is also important to remember that there are economies of scale in implementing LAP enforcement programs. The professionals and the system that is used to implement one can often, with only moderate cost increases, can handle more. This is only true, of course, if the actual design of the actual LAP programs are similar. Therefore, it makes

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good sense, both from the participant's point of view, and from an implementation perspective, to minimize the differences between different LAP programs to the greatest extent possible.

2. *Cost Recovery*

The MSA mandates that all LAP programs have a cost recovery program. Both the Secretary and the Councils are given specific tasks. The Secretary is directed to collect a fee that will be used to cover certain specified costs. [Put in appropriate citation]

Notwithstanding paragraph (1), the Secretary is authorized and shall collect a fee to recover the actual costs directly related to the management, data collection, and enforcement of

- (i) a limited access privilege program; and
- (ii) community development quota program that allocates a percentage of the total allowable catch of a fishery to such program.

(B) Such fee shall not exceed 3 percent of the ex-vessel value of fish harvested under any such program, and shall be collected at either the time of the landing, filing of a landing report, or sale of such fish during a fishing season or in the last quarter of the calendar year in which the fish is harvested.

(C) (i) Fees collected under this paragraph shall be in addition to any other fees charged under this Act and shall be deposited in the Limited Access System Administration Fund established under section 305(h)(5)(B).

Given the mandate concerning the necessity and type of cost recovery program, Councils do not face any substantive design choice questions here as they do with other aspects of a LAP program. However, knowledge of the theory and the operation of cost recovery programs is useful background for overall LAP program development.

With respect to the role of the Councils in developing LAP programs, the MSA states: [insert proper citation]

In establishing a limited access privilege program, a Council shall—

(1) develop a methodology and the means to identify and assess the management, science, data collection, observer coverage, and enforcement programs that are directly related to and in support of the program; and

(2) provide, under section 304(d)(2), for a program of fees paid by limited access privilege holders that will cover the costs of management, science, data collection and analysis, observer coverage, and enforcement activities.

(f) LIMITED ACCESS PRIVILEGE ASSISTED PURCHASE PROGRAM.—

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(1) IN GENERAL.—A Council may submit, and the Secretary may approve and implement, a program which reserves up to 25 percent of any fees collected from a fishery under section 304(d)(2) to be used, pursuant to section 1104A(a)(7) of the Merchant Marine Act, 1936 (46 U.S.C. App. 1274(a)(7)), to issue obligations that aid in financing—

- (A) the purchase of limited access privileges in that fishery by fishermen who fish from small vessels; and
- (B) the first-time purchase of limited access privileges in that fishery by entry level fishermen.

(2) ELIGIBILITY CRITERIA.—A Council making a submission under paragraph (1) shall recommend criteria, consistent with the provisions of this Act, that a fisherman must meet to qualify for guarantees under subparagraphs (A) and (B) of paragraph (1) and the portion of funds to be allocated for guarantees under each subparagraph.

The object of the fee program is to cover the costs of management and the Councils are given the task of developing the methodology and means to assess the costs that are directly related to and in support of the program. But what exactly does that mean? There is a cost recovery protocol that has been established in the halibut/sablefish IFQ program. The relevant costs are “the incremental costs (i.e., those costs that would not have been incurred but for the IFQ program)” (NMFS 2003). Conceptually, measuring these costs involves a “with and without” comparison. What is the cost of running the management program for the specified fishery under the status quo regime? What is the cost of running the management program under the LAP program? The difference is the incremental costs attributable to implementing the LAP program. While current accounting practices preclude following this procedure exactly, the basic principle can be applied.

There are two justifications for limiting recoverable costs to incremental costs.

- (1) If the issue is to find the funds to cover the costs of adding LAP programs, then the real problem is to cover incremental costs.
- (2) To minimize the disincentives for Councils and their constituents as they consider replacing non-LAP programs with LAPs, it makes sense to have participants in LAP programs only pay for the costs that are added because of the LAP program itself. For example, stock assessment costs will be required no matter what type of program is used. Given the current law, it is not possible have participants in non-LAP programs pay for stock assessments. Therefore it does not seem fair to have participants in LAP programs pay for stock assessment.

This issue was addressed in a recent GAO study on cost recovery. [GAO, 2005]. GAO pointed out that “actual costs” could also be interpreted as the full costs of managing the fishery under consideration. Every dollar that is spent on managing the fishery should be

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counted. In its response NOAA reiterated its belief that the current methodology of defining recoverable costs as those that are directly attributable to the implementation of an IFQ program to be the correct interpretation of the Magnuson Stevenson Act. The GAO stopped short of suggesting that full costs should be recovered. Rather, they said that if Congress wanted full costs to be recovered, it should clarify the cost recovery fee provision of the act. The current reauthorization of the Act made no changes.

The actual measurement of the incremental costs that are directly related to implementing a LAP program can be quite difficult. And given where the data is located, it is a task better suited for NMFS than the Councils to perform. The Operations, Management, and Information Division in some regions have instituted an automated process whereby the time spent by employees on different categories of work can be recorded and collected. In the Alaska region it is set up to capture time allocation information of all personnel who work on management or enforcement of any LAP program. These costs are collected and added to other costs that are documented to be attributable to IFQ operation such as printing, training, supply, travel, and so forth to obtain an estimate of direct incremental costs. While the procedure is more complicated than this simple explanation, suffice it to say that there are procedures that will allow the measurement of the appropriate costs and as such it will not be necessary to the Councils to develop a process on their own.

The Councils do have flexibility with respect to the use of the loan programs that can be funded using the proceeds of the cost recovery programs. The decision to implement such a program and the establishment of the criteria for participation should be based on the objectives of management plan and should be consistent with the other aspects of the LAP program discussed above. And it is important to remember that there are two sides to these programs. While they can provide benefits related to meeting general fishery management objectives, there are repercussions on the amount funds collected to pay for the LAP programs. When a fully funded loan fund program is in place, a maximum of 75% of the funds collected go toward financing the program because 25% of whatever is billed and collected always goes into the loan fund.

Given the language in the law, the determination of the fee is a straightforward calculation. With the 3% cap on the amount that can be collected, the determination of the percentage fee can be expressed as follows. Let DPC be the direct program costs measured using the process described above. Let P equals the average landings price over the season, and TAC equal the total allowable catch. The product of P times TAC is the value of the harvest. The percentage fee is then:

$$\% \text{Fee} = 100 * \text{DPC} / [\text{P} * \text{TAC}] \text{ or } 3\% \text{ whichever is lower}$$

It is interesting to note that in the Halibut/Sablefish program, the fee has always been less than the cap of 3%. However, back of the envelop calculations concerning other likely LAP candidate fisheries suggest that this will not always be the case. The Gulf of Mexico Red Snapper IFQ program, the Gulf of Mexico Reef Fish program, and the Central Gulf

of Alaska Rockfish Pilot Program are expected to have management costs greater than the 3% that can be recovered.

Because cost recovery may be an important item in the potential approval of a LAP program, it might be wise for Councils to propose an adjustment to the fee formula to at least partially compensate for funds lost to the loan program. Let L represent the per cent of fees the Council can choose to allocate to the loan program, where according to the law, L can vary from 0 to 0.25. The adjusted formula would be:

$$\% \text{Fee} = 100 * \text{DPC} / \{ [P * \text{TAC}] * [1 - L] \} \text{ or } 3\% \text{ whichever is lower.}$$

In the normal case where L is equal to .25, this is equivalent to multiplying the basic equation by 1.33. Ignoring the 3% cap for the moment, this means that if 25% of everything that is collected is given to the loan fund, there will still be enough collected to cover the direct program costs. Of course the cap does remain, and so this will only work when the basic calculated fee is less than 3%. This process has been done for the Alaska Crab Rationalization Program. See 71 FR 26728.

The Councils may also want to provide input on one aspect of the actual work of collecting the fees. However, there are some things that may be important. While one might think that the language concerning the timing of the collection of fees is a very small item and of questionable concern, it can have important implications for the business operations of the participants both with respect to convenience and cash flow issues. Councils may wish to include certain specifications in the plan after considering the needs of participants and the existing procedures fishermen use for selling and getting paid for their fish. For example, if payments are received monthly and not at the conclusion of each trip, it will likely be necessary to schedule fee payments on a monthly basis as well.

The timing of fee collection is also important with respect to enforceability. Having a program where the fees are withheld by the fish buyer will likely be more convenient for the participant and will also ensure that there is a high compliance rate.

This raises another issue with respect to the timing of fee collections. The fee can not be determined until the average price is set or at least approximated. It may be necessary to let the fishery go for several months without collected fees to get an estimate of P, which could then be used for the rest of the year. At the end of the year it may be necessary make adjustments.

3. Monitoring and Data Collection

Effective management of LAP programs requires development and implementation of a highly accurate, timely, and accountable catch accounting system. Although the system could theoretically be a manual reporting mechanism (in very small fisheries with few participants, for example, the use of paper fish tickets may be appropriate), it is almost

certain that monitoring and collecting sufficient data for managing an LAP program will require an electronic reporting system.

Such a system should provide for landing reports that include, at a minimum the date and time of the landing, the name and Official Number of the vessel from which the landing is being made, the name(s) and license number(s) of the permit holder and the individual responsible for making the landing, the name(s) of the species and poundage (or numbers of fish) being landed, the name and identifying number of the processor or buyer, the ex-vessel value of the catch (if known at time of landing), and any other information deemed appropriate and necessary to manage the program such as the identification of by-catch and discards.

The data should electronically feed into a central data bank. The information in the data bank should be immediately available to agents of the Office of Law Enforcement (OLE), program managers, fish buyers, and permit holders. Because of confidentiality constraints, it may be necessary to electronically “mask” certain information from certain users. For example, a skipper may not be authorized to view the delivery patterns pertaining to a given fish buyer/processor and a processor or other member of the public may not be allowed to view all of a skipper’s dates and times of landing. Even with certain constraints, however, a permanent record of the landing must be entered and maintained. The landing data will show the “balance” available to land on the LAP permit, and the permit holder will therefore have a permanent record of his/her landings. At the same time landing rates can be monitored and the system can be set to notify OLE if an overage is detected. Additionally, by maintaining precise in-season permit balance information, applications for transfers of permits can be more timely and accurate.

Finally, gathering complete information at the time of landing will greatly enhance future uses of the data – for analyzing possible programmatic adjustments, for reviewing and reporting on program performance, etc.

Designing a system to track landings on LAP permits should not be done in a vacuum. To the extent practicable, it should be an “umbrella” system that can accommodate landings information needed for a variety of purposes and by different jurisdictions. For example, in the Alaska Region an interagency team of programmers and managers from NOAA Fisheries (including management and law enforcement), the Alaska Department of Fish and Game, and the International Pacific Halibut Commission) have recently completed design of a comprehensive “e-Landing” system that is sufficiently flexible to meet all the needs of all the participating agencies and which is adaptable to meet specific programmatic requirements. The system is being phased in; its first use will be in the Bering Sea Crab rationalization programs. During the 2006 season, the halibut/sablefish IFQ landings system was changed over to accommodate the requirements and improvements of the new system. The system is intended to supplant the decades-old paper “Fish Ticket” system maintained by the Alaska Department of Fish and Game.

Such a system could also be used to accept biological data provided by skippers (i.e., pilothouse “log book” information) and observers. Electronic recording of this type of information at the time of landing makes for more timely and accurate recordkeeping.

Accurate and up to date records of catch are necessary to ensure that current harvest does surpass allowable harvest in any TAC system. It is especially true in a LAP program, and the job is more difficult because it is not only necessary to track total catch but catch against the individual permits. A rigorous, timely, and accurate electronic reporting mechanism is necessary to maximize the benefits of LAP programs. A good system will make enforcement of the program more robust and will greatly reduce the potential for data fouling. This will help to address public concern over the effectiveness of the management system.

Under the mandate for cost recovery premised on ex-vessel values of the harvests, it is critical that accurate records of these parameters be established and maintained. This is true, regardless of which sector (e.g., harvesting or processing) is obligated to pay the fees.

Another important element of catch accounting is “sideboard” management. Sideboards are limitations that can be placed on the activities of vessels in rationalized fisheries to prevent them from being used improperly in parallel fisheries, thus exacerbating overcapacity problems. Any sideboards imposed on vessels (or licenses) will be unique for each LAP program that is developed and may require special reporting requirements in non-targeted fisheries. Because a special “sideboard allocation” may be established in those other fisheries, electronic reporting may be appropriate to track that sub-allocation to a sub-set of vessels.

Under an LAP program, in which specific entities are allocated or otherwise obtain a specific amount of AHP in a given year, it is necessary to monitor harvests at the individual level and not simply by the overall TAC. In fisheries suffering from the “race for fish” phenomenon, all managers can do is estimate how long it will take the fleet to harvest the TAC, and based on in-season “guesstimates” of harvest rates, terminate the fishing season when expected harvest is equal to the TAC. A post-hoc landings review is necessary to determine if actual harvest is at or below the TAC.

An LAP program design ensures that the season will be spread out over a greater length of time and that it will be prosecuted in a more orderly fashion. The benefits of this approach are legion; however, the trade-off is the requirement to design and implement a more robust reporting system.

As in most things, the simpler the program design, the less complex its implementation will be. This includes the design of the system to record harvests. For example, restrictive eligibility to own and transferability rules can make it more complex to issue and keep track of permit ownership. However, because of the paramount consideration of the health of the resource, and because a major tool to ensure that health is the use of

hard TACs, the burden of timely and accurate harvest reporting is a necessary cost of good management.

4. Permits

Permitting is at the heart of managing harvest privileges under a LAP system. The LAP permit defines the nature of the privilege (what activity does it allow?), describes any limitation on the permitted activity (how much is allowed, by what methods and means?), delineates its duration (effective when, and for how long, may the privilege be exercised?), and identifies the person or business entity that may exercise the privilege. Further, each permit is assigned a unique number or other identification.

Once assembled and issued, the permit information is included in the agency database. Information in the database is accessible to managers and to enforcement. The information is also available to the general public and can be published on the agency's web site.

Many LAP programs provide for the use of more than one type of permit. For example, the following permits are issued under the Bering Sea/Aleutian Island Crab Rationalization program:

Quota Share (QS) permit [a permit of indefinite duration that indicates, by fishery and area, the number of units of QS one holds; in the most basic sense, the number of units represents the percentage of the annual Total Allowable Catch (TAC) the QS permit holder may harvest];

Processing QS permit (similar to a harvesting QS permit, but issued to eligible processors to permit receiving crab from harvesters);

Individual Fishing Quota (IFQ) permit (the annual permit that displays the number of pounds the permit holder may harvest);

Individual Processing quota (IPQ) permit (the processor equivalent of the IFQ permit);

Registered Crab Receiver permit (a numbered permit, issued annually, to entities eligible to receive IFQ crab);

Crab Harvesting Cooperative permit;

Crab Vessel permit; and,

Crab Hired Master permit.

In addition, the program calls for several certificates (e.g., certificate of eligibility to receive crab QA by transfer). The halibut/sablefish IFQ program also uses several different types of permits. The new Bering Sea crab rationalization program is even

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more complex; it includes all of the types of permits outlined above, as well as processor Quota Share and annual Processing Quota amounts, vessel permits, cooperative permits. Some permits (e.g., the QS permits) are transferable to certain eligible persons, while others are not. The point is that any LAP program requires permitting, and frequently of more than one aspect of the program.

Permitting is essential to manage both the fishery and the LAP program. Permitting unambiguously establishes who is allowed to participate in the fishery, under what terms and limitations, for how long, etc. Good permitting is essential for good Law Enforcement, and Enforcement personnel should be directly involved in designing the permitting program to ensure that the permits are sufficiently specific to clarify when violations have occurred. Additionally, Enforcement personnel should have ready access (electronic, if possible) to permitting information at the Regional Offices, so that review of the data from the field would be possible.

It is clear that a LAP program with many complex design elements will give rise to more permitting requirements than a program with simple elements. For instance, a comprehensive program that includes quota shares in a variety of fisheries for a variety of fishery sectors (e.g., vessels, skippers, processors, etc.) will require a more sophisticated suite of permits than a program that simply limits entry with a transferable license.

Another consideration in a LAP program is accountability for individual quota accounts; in that case, timely and accurate reporting of removals is essential to good management – and such reporting can be made a permit requirement (for instance, it can be made an obligation of a business that holds a permit to receive LAP species from a permitted harvester). Withholding, or failing to renew, a permit can be used as a way to induce compliance with the permitting requirements.

5 Determination and Appeals

According to the MSA, when Councils prepare a LAP program, they must:

include an appeals process for administrative review of determinations with respect to the Secretary's decisions regarding administration of the limited access privilege program; [citation]

A process for making fair, honest, and accountable determinations on applications for harvest privileges and subsequent associated matters (e.g., transfer applications) must be developed and included in regulations implementing a LAP FMP. The system should contain provisions for accepting and reviewing applications, and it should establish standards against which applications will be adjudicated. Additionally, it should provide for preparation of full decisions while including time frames binding on both the applicants and the agency and. Finally, it should provide a formal process for appealing administrative determinations to a separate office established for that purpose.

For purposes of initially allocating the harvest privilege (whether a license, quota, certification of catch history for cooperatives, etc.), it is useful to create an “Official Record,” derived from licensing and harvest files, as a starting point. The Official Record would contain all relevant current and historic data related to persons perceived to be eligible for the privilege. Depending on the allocation criteria, the record could be assembled to include annual vessel licensing and ownership information, vessel characteristics (LOA, displacement, predominant use, etc.), historic harvest information for identified qualifying years, by vessel or license number or however it may have been recorded, licensing information on all who appear to be eligible for initially issued harvest privilege, and any other information from an official source(s) that may be used to construct a profile of potentially eligible persons.

Once collected, the raw data should be assembled and organized in such a way that the agency can determine who is eligible for the harvest privilege. Once assembled, the Official Record is presumed to be correct. However, that presumption is refutable. Applicants must be given the opportunity to challenge the Official Record; however, those who do challenge it have the burden of demonstrating that his/her contrary claims are accurate.

When a timely⁶ application is received, the information set out on the application is compared with the information in the Official Record. If the applicant has advanced a contrary claim, and has submitted sufficient evidence to support it, it can be accepted. On the other hand, if an applicant’s claims are not sufficiently supported, s/he should be so notified and provided a period of time to provide additional information in support of the claims. If s/he does so, and the information is sufficient to amend the Official Record, then that should occur and the harvest privilege issued. Alternatively, if s/he does not provide sufficient information, then the claims should be formally denied.

The denial should be issued as an Initial Administrative Determination (IAD). This is a formal decision on an applicant’s claims that identifies the applicant, the program, and the claim. The IAD contains a background section that summarizes the proceedings to date and then discusses the claim in light of information in the Official Record and the requirements of the regulations. The formal denial is then set out and the applicant is informed of her/his right to appeal.

The Alaska Region has established a separate “Office of Administrative Appeals” to handle all appeals of IADs. Other regions, with a smaller number of administrative determinations may not find that it is cost-effective to establish such an office and,

⁶ Application deadlines can be useful for bringing the application period to a close, thus allowing implementation to move forward to the next stage; also, if there is a possibility that more than one applicant could apply for the harvest privilege premised on the same activity (e.g., vessel landings during a certain season), an application period serves to identify those conflicts and allows them to be resolved before issuing the benefit. Finally, application deadlines bring certainty and stability to the process, thus furthering the goal of seeking to implement a LAP program in the first place. On the other hand, denying and adjudicating “late” applications can be time consuming and counter-productive, especially if a small amount of quota (or other privilege) is at stake. Managers should decide on a case-by-case basis how to approach this issue.

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instead, rely on appeals assistance from NOAA General Counsel. Either way, the appeals function should be separate from the regular decision-making chain of command and should be absolutely neutral with respect to considering claims from applicants.

The standards for handling appeals should be determined regionally, but are relatively straight-forward. The appeals officer (hearing officer) should be given sufficient authority to seek documents, administer oaths, subpoena persons and documents (if permitted) and, generally, have all the powers of most administrative law judges. Upon completion of a full record on appeal, a decision should be written.

Subject to review by the Regional Administrator, advised by General Counsel, a Decision should become the Final Agency Action on an applicant's claims 30 days after it is issued. At that point, the agency either approves or denies the claim. At this point an aggrieved applicant's only remedy is an appeal to a U.S. District Court.

The key to whole process is fairness and objectivity. Every effort should be made to ensure that political intervention will not be rewarded or tolerated. It is improper and unethical for anyone other than the interested parties and their legal representatives to try to influence the outcome of any adjudication. For that reason, it is recommended that tribunals of lay persons (e.g., Council committees) not be used to adjudicate claims or to hear appeals. The surest way to invite cries of favoritism and corruption is to allow the process to appear to be politicized.

Although this discussion has focused on the application process, the same general approach should be used whenever a person applies for a benefit accorded by a LAP program. For instance, if a an application to transfer (sell or lease) quota is received, and if approving the application would violate the terms of the regulations that govern the program, the same system would be utilized to bring closure to the conflict.

LAP programs are controversial and frequently contentious. Additionally, they have the potential of conferring significant benefits on successful applicants. To be accepted by industry and the public, it is essential that the process by which the benefits are conferred, and contrary claims adjudicated, is honest, fair, clear, and incorruptible.

At the inception of a LAP program, it is necessary to determine who will, and who will not, benefit from the initial allocation of the harvest privilege. Some ("winners") will have the harvest privilege issued to them, while others ("losers") will not. This is true regardless of the method used to distribute the benefit.

There are distinct legal requirements (due process – notice and the right to be heard) that govern the ways in which government benefits are conferred and withdrawn. In one instance, the US Court of Appeals (9th Circuit) ruled that an applicant for a harvest privilege in a LAP program (Alaska halibut and sablefish) had a "property right" in the privilege and that it could not be denied the applicant without full due process of the law. To ensure the legal sufficiency of the procedures implemented, General Counsel should be consulted.

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In addition to legal obligations, effective program implementation requires that agency leadership, at both the HQ and Regional levels, stand between political pressure and staff who are implementing the program. If a phone call from Senator “So-and-So” results in preferential treatment for one of his more prominent supporters, all is lost. The system will rightly be condemned as corrupt. If that happens, the contemptuous attitude of industry will be reflected in behavior on the grounds, to the detriment of regulatory compliance and the resource itself.

The bottom line is that may not concentrate on this aspect of a LAP program, they are both critical and very complicated. The somewhat elaborate system outlined above pertains directly (and specifically) to LAP programs. Although the basic elements of due process (notice and the right to be heard) pertain to all government activities that affect citizens, only LAP programs depend of the alignment of certain facts to demonstrate eligibility for a benefit.

It is axiomatic that more complex and challenging programs give rise to more (and more complex) determinations and, thus, appeals. The Alaska halibut/sablefish IFQ program) is a program with many elements. An applicant was applying not only for Quota, but for certain amounts of quota premised on vessel activities over a 7 year period; additionally, an applicant was seeking quota in a particular vessel length and use category and in a particular area for each of the two species. With over 8,000 applications for quota, the potential number of combinations of factual administrative determinations to be made was staggering. The process did produce 11,600 IADs that gave rise to almost 170 appeals.

To the contrary, the eligibility test for the Norton Sound red/blue king crab limited license program was whether, in either or both of two years, an applicant had held a state of Alaska permit to participate and whether the applicant did, in fact, participate (as demonstrated by a harvest record). There were no appeals of any IADs in that fishery.

Another source of adjudicative complexity is regulatory provisions that provide credit for “special” or “unavoidable” circumstances, or hardships. For instance, if a harvesting requirement may be waived upon a showing that, but for an “unavoidable” hardship that kept an applicant’s vessel from participating, then the adjudication burden increases dramatically. Every such claim, even those apparently frivolous on their face, is inevitably complex and must be handled with considerable care. And because appropriate determinations depend almost always on the facts of a particular situation, formal hearings by trained appeals officers are frequently the only way to resolve them.

6. A Final Note on Program Complexity.

From the above discussion it can be seen that implementing and operating a LAP program can be quite complex. Further, administration costs will vary directly with program complexity. What is important is that in many cases, Councils can have a very significant effect on implementation and operation complexity by the nature of the

program they design. LAP FMPs that address simple and one-dimensional problems with simple one-dimensional programs are less expensive and complex to implement. But most problems in fisheries are not simple and one-dimensional; rather, they are complex, involve several industry sectors, require thoughtful balancing of a variety of interests, and almost inevitably lead to more complex programs. However, while Councils should design programs to meet fishery management objectives, it is prudent to balance the relative expense of implementing a complex system against the benefits achieved, especially if there are other ways to achieve the same benefits.

Put another way, simplicity of design should not be a goal in and of itself; rather, in some rare cases, it can be viewed as a gift. Councils should focus on designing the programs they need to address the myriad complexities and pressures they face. Sacrificing program effectiveness for simplicity could be a mistake and could well lead to additional complexities in the future, as steps are taken to “retro-fit” program amendments. On the other hand adding more and more complexities to address every perceived nuance can impose costs, that if not carefully considered may not be commensurate with the real gains.

Appendix 1 Excessive Share Details.

Economic Foundation for the Basic Principle

While the actual determination of an excessive share rate involves more than economics, a conceptualization of the economic issues can serve as a useful framework for policy formulation when applying the basic principle and for a discussion of the types and details of analysis that would ideally be necessary. The essence of the framework can be summarized in the hypothetical example presented in Figure A1.1. The choice of the share limit, s , is important because it can affect the net value of goods and services produced in the economy. Depending on the market conditions of the particular situation, the choice of s will allow for, or cause, economic inefficiencies. The dollar amount of efficiency losses will vary with the level of s as shown in Figure A1.1.

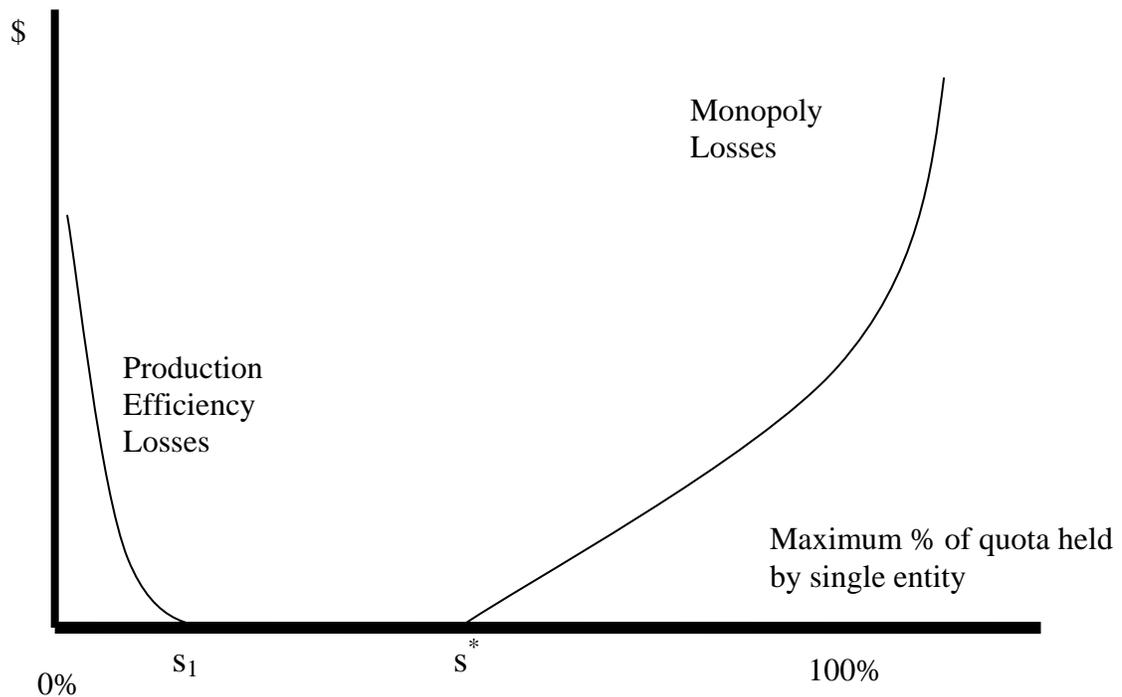


Figure A1.1

At higher levels of s , there is the potential for efficiency losses due to monopoly pricing. Whether such losses will occur will depend upon the given set of market conditions and the TAC level. In some cases there will be no potential for monopoly losses even if s equals 1. If such losses will exist when $s = 1$, (as is the case in the hypothetical situation depicted in the figure) then they will monotonically decrease as s is decreased. For purposes of this discussion, s^* has been defined as the highest share rate which will

prevent any monopoly losses. In terms of Figure A1.1, s^* is the market power excessive share limit. While it would be very difficult to estimate how monopoly losses will vary with s , when there is adequate economic information, it is relatively easy to obtain an estimate of s^* , the share rate when the monopoly losses fall to zero, which is all that is necessary for policy purposes.

On the other hand, at lower levels of s , there will be the potential for a different type of efficiency loss. If the output level of firms is constrained by the choice of the s rate, the cost of producing the TAC may be higher than necessary and, further, incentives to develop more efficient vessels and higher quality products may be blunted. The size of these losses will depend upon the number and types of vessels in the fleet and the potential technological and market innovations. In the hypothetical case here, s_1 is the share level when production constraints will start to affect at least one vessel. As s is reduced below s_1 , more vessels will be affected and the constraints will cause higher costs and so the sum of efficiency losses will increase.⁷

While the concept of output constraints imposing inefficiencies is straightforward, it will be a very difficult task to measure them in actual LAP programs. This would be true even if fleet size and technology remained constant. However, as permanent quota shares and annual harvest privileges (AHP) are traded, and especially if the LAP program replaces a TAC or other regime which affect vessel operation, there will be incentives for fleet size and technology to change. It would be difficult to measure the efficiency losses for the existing fleet, but it will be that much more difficult to predict how the fleet will change and then estimate how the s rate will affect efficiency. However, for policy purposes, it is the production inefficiencies that may occur with the hard to predict changes that will be important.

Ignoring the measurement difficulties for the moment, assume that the curves in Figure A1.1 show how inefficiency losses will vary with s . As far as economic efficiency is concerned the s rate should be no higher than s^* . That will correct for any possible monopoly losses. At the same time any rate between s_1 and s^* , will have exactly the same effect. All of them will correct for potential monopoly losses and yet none of them will cause any production efficiency losses.

Therefore if a Council desires to achieve a management objective by reducing the share rate, there will be no economic concern as long as the chosen rate is higher than s_1 . However, if a lower share rate is chosen, there will be efficiency losses. Conceptually if the share rate is to be less than s_1 , the gains from achieving the management objective, although they will be measured in a different metric, should be greater than the efficiency losses.

Details on Market Power Analysis

⁷ It is assumed, as will likely be the case, that the two curves do not cross. If they did, which would be the case if s^* is so small that curing for monopoly would lead to other economic inefficiencies, then the critical cost point would be at the s where the sum of the two curves is a minimum.

The fundamental policy question is: What is the maximum percentage of the TAC that can be given to a single entity before there will be incentives to withhold production. Using basic microeconomic principles, it is possible to derive a formula for determining what that percentage should be for any given market situation. The calculated value of s^* will prevent undue market power in both the market for fish and the market for shares.

If we let the market demand and supply curves of fish be represented as:

$$\begin{aligned} P_D &= P_D(Q) && \text{Demand} \\ P_S &= P_S(Q) && \text{Supply} \end{aligned}$$

where Q is the level of market output, the required formula is:

$$s^* = -[1 - \{P_S(TAC)/P_D(TAC)\}] / [1/e_D - \{P_S(TAC)/P_D(TAC)\}/e_S] \quad (1)$$

The terms e_D and e_S , represent the elasticity of demand and supply respectively, and they and P_D and P_S must be evaluated where Q equals the TAC in the LAP fishery⁸.

Since e_D is negative, s^* will be positive. As the difference between the demand and the supply price increases, s^* will increase. Likewise as e_D and e_S get larger, s^* will increase. The calculated value can be greater than 1, which means that given the parameters values, the MR and MC curves for 100% of the AHP intersect at an output lower than the TAC. Looking at the two extreme cases can make interpretation somewhat simpler. If the demand curve is horizontal so e_D is equal to infinity, the equation reduces to:

$$s^* = -[P_D/P_S(TAC) - 1]e_S \quad (2)$$

If the supply curve is horizontal so the P_S equals the constant MC of production, the elasticity of supply is infinite and the s^* equation becomes:

$$s^* = -[1 - MC/P_D(TAC)]e_D \quad (3)$$

In the above expression, s^* is proportional to the elasticity of demand and the ratio of proportionality will always be less than one. The higher is the elasticity of demand and the lower MC is relative to price, the higher will be the value of s^* and the less concern there will be for possible monopoly actions. See below.

Practical Applications

While the general formulation of the s^* equation is rather complex, its value can be calculated using three parameters: the elasticities of demand and supply and the ratio of P_S to P_D , all evaluated at the TAC level of output. Nonetheless, it may be difficult to obtain estimates of these parameters for practical policy analysis. The problem is made

⁸ The values for P_D and P_S will be different because the price of AHP drives a wedge between the demand and the supply curve where Q equals the TAC.

even more difficult because while the decision on an excessive share value will likely be made before an LAP program is implemented, the introduction of the program will likely change demand and supply conditions through changes in product quality and harvesting and processing technology.

To be more explicit, the market parameters used to calculate s^* must be the ones that will apply in the working LAP fishery which, for reasons discussed below, will often, after a transition period, be different than the ones that apply in the status quo market. Since staff will only have (incomplete) status quo data, the calculated value of s^* must be interpreted with care. A related point is that the analysis of the possible inefficiency costs that will be imposed by setting a MO limit less than the MP limit to obtain a management objective, should also consider the cost structure that could potentially occur under the unfettered operation of the LAP program.

But perhaps the potential inability to obtain accurate estimates of the necessary parameters may not always pose a problem. Consider Table 2 which shows the value of s^* for a range of P_S/P_D and of elasticities of supply when the elasticity of demand is equal to -2. Except for the top left hand corner of the table, the values are quite large even for this moderate value for the elasticity of demand. And as the fixed value for the elasticity of demand is increased, this becomes more pronounced. See Table 3 where the elasticity of demand is set at -10. In the lower right hand part of the tables, the s^* values are listed as being equal to 1, because the calculated value is greater than 1. This means that no share limit is required to prevent output reduction.

And while the elasticity of demand for a particular fishery is an empirical question, it is safe to assume that it will generally be elastic. There are many substitutes for most fish products, including the flesh of other types of fish and sources of protein from other animals. Further, it should be remembered that the demand curve under consideration is the one facing the producers in the particular fishery under LAP management. That is, there may be an LAP program for “green fish” in one region but there may be other sources of the exact same fish from other regions. One could assume that the demand curve facing the producers in the LAP fishery would be quite elastic, perhaps even perfectly elastic.

Note that while the left hand column is the ratio of supply price (MC) to demand price, for practical purposes the demand price at the TAC level of output will likely be known. The important issue is the marginal cost. Note that that the excessive share limit increases with MC. The reasoning is as follows. The benefits from withholding production are the higher prices for the remaining output and the cost savings from the reduction in output. Therefore, all else equal, firms with higher costs will have higher benefits from restricting output and will require tighter excessive share limits.

Ps/Pd	$e_D = -2$										
	0.75	0.90	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
0.9	0.06	0.07	0.07	0.09	0.11	0.12	0.13	0.13	0.14	0.14	0.15
0.8	0.13	0.14	0.15	0.19	0.22	0.24	0.26	0.27	0.29	0.30	0.30
0.7	0.21	0.23	0.25	0.31	0.35	0.38	0.41	0.43	0.44	0.46	0.47
0.6	0.31	0.34	0.36	0.44	0.50	0.54	0.57	0.60	0.62	0.63	0.65
0.5	0.43	0.47	0.50	0.60	0.67	0.71	0.75	0.78	0.80	0.82	0.83
0.4	0.58	0.64	0.67	0.78	0.86	0.91	0.95	0.98	1.00	1.00	1.00
0.3	0.78	0.84	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
e_s	0.75	0.90	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00

Table 2. Comparative values of s^* when the elasticity of demand is -2 .

Again, while the ratio of MC to price in any LAP fishery is an empirical question, there are reasons to believe it will not be excessively high and perhaps that it might be quite low. To make a long story short, it depends upon the vertical difference between the post LAP demand curve and the long run efficient supply curve at the TAC level of output. The larger that difference, the lower will be the MC/P ratio.

Ps/Pd	$e_D = -10$										
	0.75	0.90	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
0.9	0.08	0.09	0.10	0.14	0.18	0.22	0.25	0.28	0.31	0.33	0.36
0.8	0.17	0.20	0.22	0.32	0.40	0.48	0.55	0.61	0.67	0.72	0.77
0.7	0.29	0.34	0.38	0.53	0.67	0.79	0.90	1.00	1.00	1.00	1.00
0.6	0.44	0.52	0.57	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.5	0.65	0.76	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.4	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
e_s	0.75	0.90	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00

Table 3. Comparative values of s^* when the elasticity of demand is -10 .

From a casual perusal of the two tables and the understanding that the elasticity of demand will *tend* to be high and the MC/P ratio will *tend* to be low, it does not appear that monopoly restrictions of output will be very likely in LAP fisheries. It is an indication that the concern over monopolistic excessive share is ill founded. Put another way, the excessive share limits that have been set in real world fisheries (20% in New Zealand and less than 1% in the Alaska Halibut fishery) will likely prevent any monopoly problems whatever the reason for their implementation.

The above analysis suggests that in the absence of the required parameters, a useful approach to determining an s^* for a real world fishery would be to come up with the best *The design and use of limited access privilege programs*. November 2006 Preliminary Draft

estimate of the elasticity of demand and use it to construct a table similar to those in the text. Unless there is reason to believe that the parameters that apply to this fishery are in the range where the s^* value is less than 1, there is no need to set a monopoly excessive share limit. In the opposite case, try to come up with the best rough estimate of the other two parameters and set the s^* accordingly using a conservative approach.

Finally, it should be stressed that even if all of the values in the table equal 1, it does not follow that no excessive share limits are necessary. The analysis here has focused solely on monopoly power excessive share limits. Share limits which address fishery management objective or equity concerns have not been considered.

As a final note, it was stated above that to properly calculate the value of s^* for a particular fishery, it would be necessary to use market parameters that would exist in the fully operational LAP fishery. However, since the incentives in the LAP market will tend to reduce costs and increase price (i.e., reduce the MC/P ratio), all else equal using the status quo estimates of MC and P will result in a MP limit that is more restrictive than necessary, which will provide something of a safety margin.

Appendix 2

Types of Auctions

1. Single-round sealed-bid auction

In a sealed-bid auction participants simultaneously submit bids for desired quantities of fishing privileges along with the per-unit prices they are willing to pay. This auction uses only one round of bidding to allocate all the auctioned privileges. Participants each submit one or multiple bids that reflect their value of holding specific quantities of fishing privileges. For example, a bidder might be willing to pay \$100 per unit for the first 100 units, but only \$75 per unit for the next 100 units, and could submit a two-part bid to reflect these preferences. The auction authority collects the bids and orders them from highest to lowest price to form an aggregate demand schedule. The point at which the aggregate demand schedule equals the available supply of fishing privileges determines the clearing price. All bids above the clearing price are accepted. Any remaining privileges are then rationed among bids equal to the clearing price, for example by dividing them in proportion to the bid quantities or by lottery. Bids below the clearing price are rejected. See Figure A2.1 for an illustration.

Determining prices paid. With sealed-bid auctions the *quantities* that successful bidders win are determined by the quantities specified in their accepted bids. There are several standard approaches for determining the *prices* that each winning bidder pays. Different pricing rules will result in different bidding incentives and strategies, so the pricing rule is a very important component of the auction design. Under pay-your-bid pricing,

participants pay the prices specified in their successful bids. Under uniform pricing, all successful bidders pay the clearing price, which is the price of the lowest successful bid.⁹

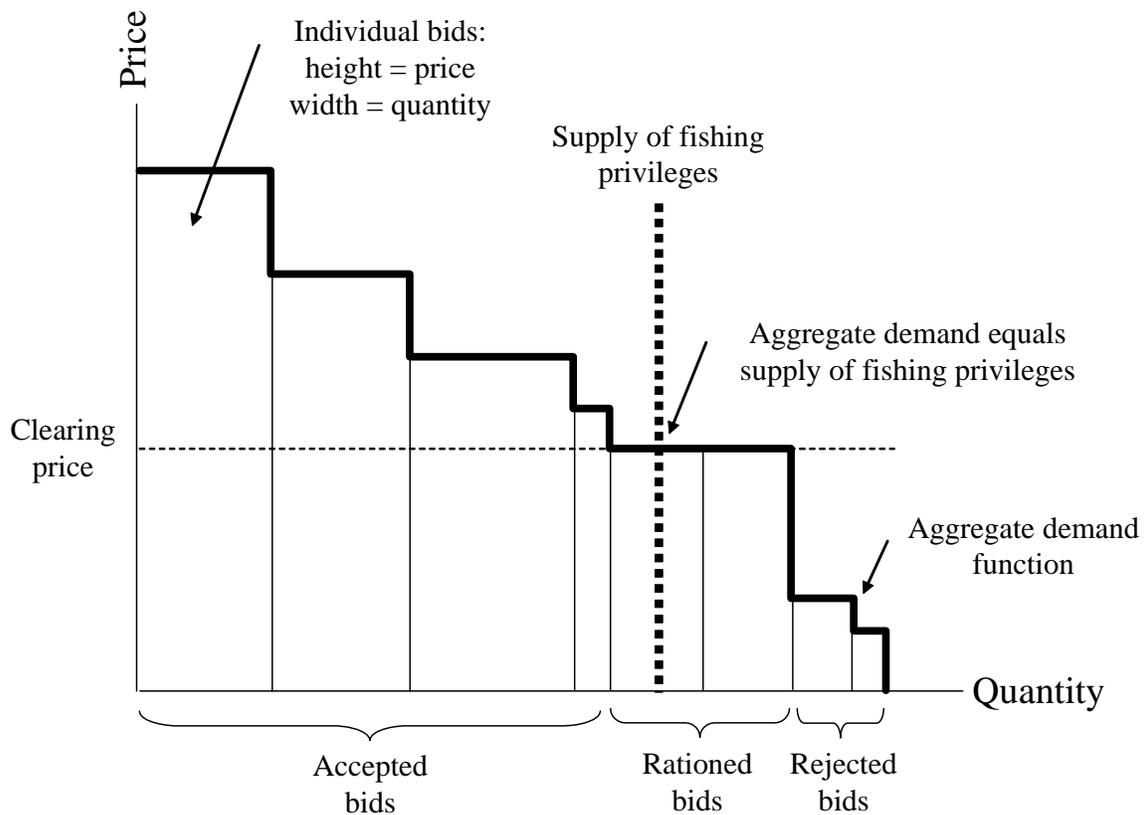


Figure A2.1

Bidding incentives, revenue, and economic efficiency. With pay-your-bid pricing, the auction in the figure above would raise revenue equal to the area under the aggregate demand schedule and to the left of the supply of fishing privileges. With uniform market-clearing pricing the auction in the figure above would raise revenue equal to the area of the rectangle bounded on top by the clearing price and on the right by the supply of fishing privilege. In the figure, pay-your-bid pricing would result in more revenue than uniform pricing.

The analysis in Figure A2.1 ignores an important consideration, however, which is that bids under uniform pricing likely will be higher overall than bids under pay-your-bid pricing. Bidders under pay-your-bid pricing have substantial incentives to “shade” their bids by bidding below their true value of holding fishing privileges in order to reduce the prices that they pay. Bids below the clearing price are not accepted, however, so bidders

⁹ Alternatively, uniform pricing could use the price of the highest unsuccessful bid. See below for empirical evidence regarding the effects of these different pricing approaches on bidding behavior and revenues in laboratory experiments.

need to guess what the eventual clearing price will be and bid above it. Uniform pricing reduces the incentive for bidders to shade their bids.

Which of these pricing approaches is most efficient and raises the most revenue must be determined empirically. The results of recent laboratory experiments designed to simulate New Zealand fishery auctions suggest that bids are higher under uniform market-clearing pricing than under pay-your-bid pricing, as expected, but that pay-your-bid pricing still generates more revenue. Both pricing approaches led to equally efficient initial allocations.¹⁰

2. Multiple-round clock auction

A clock auction uses multiple rounds of bidding to allocate fishing privileges. In a clock auction the “clock” indicates the current price, which starts low. Participants submit bids for the amount of fishing privileges they are willing to purchase at that price. The auction authority adds up the bids and reports the total quantity demanded at that price. If aggregate demand exceeds the supply of available fishing privileges the auction authority increases the price on the clock either by a predetermined increment, according to some rule, or based on discretion. The process repeats until aggregate demand falls below the supply of available fishing privileges. At this point the auction authority accepts all remaining bids at the previous price and rations any remaining fishing privileges among participants that reduced their demand in the final round. An “activity rule” is needed to encourage active participation in the auctions early rounds. The rule is that bidders may not increase their demand as the price increases.^{11,12}

10 An economist named Vickrey developed a pricing approach for sealed-bid auctions that, at least in theory and under certain conditions, should result in the most economically efficient outcome. Under Vickrey pricing each participant pays an amount equal to the total value (i.e., price times quantity) of the of the unsuccessful bids submitted by the participant’s competitors that would have been accepted had the participant not submitted any bids at all. The key to Vickrey pricing is that bid shading does not reduce the amount paid, because prices depend wholly on the bids of others, but bid shading does reduce the chances of winning. Bidders therefore have an incentive to submit bids that reflect their “true” value of holding different quantities of fishing privileges, resulting in economically efficient initial allocations. In practice, bidders may be reluctant to report their true values if they fear that such information, if made public, could hurt them in future auctions or negotiations. Vickrey pricing is considerably more complicated than pay-your-bid or uniform pricing, can lead to low revenues, and may be more susceptible to collusion among bidders.

11 Ascending-bid auctions are multiple round versions of sealed-bid auctions. Each round operates just like a sealed-bid auction. The clearing price following each round is preliminary. If nobody wants to increase any bids, the auction ends, and the winning quantities are determined just as in any sealed bid auction. If any bidder wishes to improve a bid in light of the preliminary clearing price another round is offered. Councils generally will prefer an ascending-clock auction to an ascending-bid auction. Bidding is simpler in the ascending-clock auction, because bidders submit just a single quantity bid in each round. The activity rule is simpler. The auction ends sooner, because bidders only have one bid to change in each round. The auction is less susceptible to collusion, because the auction authority need only report total demand following each round.

12 An economist named Ausubel developed an ascending-clock auction with a modified allocation and pricing rule. The auction authority accepts bids as they are “clinched” and at the price where this occurs. A bidder clinches fishing privileges when the total quantity demanded by everyone else falls below the available supply. At this point the bidder is guaranteed of winning an amount equal to the total available
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Other Issues and Challenges in Auction Design

1 Avoiding collusion

Collusion occurs when bidders explicitly or implicitly agree to avoid bidding up prices. Collusion is most likely to be a problem in multiple round auctions, because bidders can use early rounds to signal and coordinate their behavior, and can retaliate in later rounds against bidders who deviate from potential agreements.

There are several ways to mitigate collusion. First, Councils should promote broad participation, because it is more difficult to collude when there are many bidders. Second, Councils can limit the amount of information that is made public between rounds in multiple round auctions. For example, the auction authority need only reveal the total quantity demanded between rounds in a clock auction. Finally, the auction authority should require that participants bid in round numbers in both types of ascending auctions to prevent bidders from encoding messages in their bids.

2. Reducing the effects of the Winner's Curse

The winner's curse befalls auction participants who overestimate the value of fishing privileges and win by bidding too high. This is most likely to happen when the value of holding fishing privileges is highly uncertain at the time of the auction, such as when new species are brought under limited access management. Bidders might be uncertain about future market prices for fish products, changes in the health of the fishery, a shifting TAC, new fishery regulations, and other factors that might affect the value of holding fishing privileges. Under these circumstances bidders that win at auction may be those that overestimate the value of fishing privileges the most. Knowing this, auction participants will respond to uncertainty by lowering their bids to protect against paying too much.

Some experts argue that multiple-round auctions deal with the bid-lowering effects of the winner's curse more effectively than sealed-bid auctions. This occurs because bidders in multiple-round auctions learn how others value fishing privileges with each successive round, thereby gaining confidence in their own bids, eventually leading to higher prices. This is most likely to occur when auction participants have bidders similar to themselves (e.g., similar size and harvesting techniques) that they can look to for comparison.¹³

supply minus the total quantity demanded by everyone else, so this is how much the bidder clinches. Everyone's clinched privileges are removed from available supply following each round, and the clock then continues to increase. Analogous to the Vickrey auction above, under certain conditions Ausubel auctions give bidders the incentive to report quantities that reflect their "true" demand for fishing privileges, resulting in efficient initial allocations.

¹³ Some experts argue, however, that ascending-bid auctions actually may exacerbate the winner's curse when auction participants do not compete with similar bidders. The rationale is that advantaged bidders, such as those with lower harvesting costs, will bid more aggressively in the auction's initial stages, causing weaker bidders to be especially cautious, because outbidding a stronger bidder is evidence that you have overestimated value substantially. The result is that stronger bidders usually win and pay low prices. This *The design and use of limited access privilege programs*. November 2006 Preliminary Draft

Some experts argue that a sealed-bid auction with pay-your-bid pricing will expose bidders to an increased risk of the winner's curse relative to uniform pricing, thus leading to more cautious bidding and lower expected revenue from the auction. Therefore it may be preferable to use a uniform pricing scheme for sealed-bid auctions.

3. Reducing uncertainty

While choosing an appropriate auction method has the potential to mitigate the effects of uncertainty on bidding behavior and auction revenues, Councils can do a number of things prior to the auction to reduce uncertainty directly. Such actions include disseminating scientific and market information about the fishery, establishing predictable and transparent procedures for setting TAC in future years, and dealing with foreseeable regulatory issues immediately rather than delaying such issues to the future.

Fishery participants might be particularly wary when bidding on "permanent" fishing privileges that last the full duration of the limited access program. Councils might consider auctioning only annual privileges initially and auctioning privileges lasting a longer duration at a later date after fishery participants have had an opportunity to observe price information in secondary markets and in auctions of annual privileges.

4. Auctioning privileges for related species or fish stocks

In some cases the value of fishing privileges for different species or stocks will be interdependent. To take one extreme example, if species A and B are caught simultaneously in precisely equal quantities, the privilege to harvest a single unit of species A is worthless unless one also holds a matching privilege for species B. Conducting multiple clock auctions for different species simultaneously would allow fishermen to update their bids as the auctions progressed to ensure that they have fishing privileges in the appropriate combinations. Sealed-bid auctions do not allow fishermen to update their bids to ensure appropriate combinations and therefore could result in cautious bidding and low auction revenues, although fishermen would still have the option of acquiring appropriate combinations of fishing privileges in the secondary market. Multiple clock auctions require modified activity rules and have other unique features that are beyond the scope of this discussion, so Councils should research these auctions thoroughly before implementing them.

Some auction approaches allow bidding on particular "combinations" of fishing privileges, such as a bid on 100 units of species A and 200 units of species B for a total of \$1500. Auctions that allow bidding on particular combinations may result in more efficient initial allocations and can raise additional revenue but are complicated to implement in practice and likely beyond the needs of most Councils. Councils that

argument suggests that sealed-bid auctions, which give weaker bidders a better chance of winning, encourage more aggressive bidding overall.

determine that bidding on combinations is important should research such auctions thoroughly.

5. Determining a reserve price

The auction authority can set a reserve price below which no bids are accepted. A reserve price can limit the gains from collusion because bidders will always pay a minimum price. A reserve price also guarantees that the seller will receive a minimum amount for any privileges sold.

The reserve price should reflect the value of fishing privileges. It is easy to determine the reserve price when a secondary market for fishing privileges already exists: the reserve price should roughly equal the price of fishing privileges in the secondary market, with perhaps a modest cushion to avoid setting the reserve price too high. Even when no secondary market exists, such as when a new species is brought under limited access management, it might be possible to estimate a likely range of values based on the market price of fish, harvesting costs, and other industry data.

In cases where Councils are unable to generate a reliable estimate of the value of fishing privileges, Councils may choose not to set a reserve price. Auctions without reserve prices are most likely to be successful when Councils expect strong competition for fishing privileges. Whether or not Councils expect strong competition, however, they might consider auctioning annual fishing privileges rather than privileges that last the full duration of the limited access program. This would limit the effects of an inappropriately low sales price to one year, and Councils subsequently could use secondary market prices to set reserve prices for future auctions.

6. Avoiding loopholes and remaining credible

Councils should scrutinize auction rules closely for any loopholes that might lead to unintended outcomes. For example, the rules should make clear that all bids accepted by the auction authority are binding. Otherwise, participants might decide to default on their commitments at a later date.

Councils also should make sure that they are able to enforce the auction rules credibly. For example, if the auction authority sets the reserve price too high and no fishing privileges are sold, it might be pressured to lower the reserve price after the fact, reducing its future credibility regarding reserve prices and other auction rules. The auction authority therefore should set a reserve price and other auction rules it knows it can commit to and select these rules with care.

Fishery managers will also have to make decisions about whether to reveal the identities of bidders and/or the magnitude of their bids. Some analysts argue that allowing bidders to know the identities and bids of other bidders can make colluding easier and disadvantage smaller bidders, particularly in multiple round auctions. In auctions for Treasury securities, even the identity of winners is considered confidential business

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information. Others believe transparency is valuable and appropriate for federal programs. In auctions for New Zealand fishing privileges, only the prices and quantities of winning bids are made public, while the identities of winning bidders are not. In auctions for SO₂ allowances, the identities of all bidders and their winning and losing bids are made public.

A review of existing public auctions for fisheries and other natural resources

Fisheries in New Zealand¹⁴

New Zealand introduced a quota management system (QMS) for its marine fisheries in 1986. The system is characterized by a total allowable catch (TAC) set annually for each fish stock, individual transferable quotas (ITQ) that each represent a share of the TAC, and annual catch entitlements (ACE) that flow from the ITQ and depend on the level of the TAC.

The Maori (indigenous New Zealanders) receive 20% of the ITQs for any new fish stock incorporated into the QMS. If harvesters' catch histories together exceed 80% of the initial TAC, the Ministry of Fisheries (MFish)¹⁵ allocates the remaining ITQs to harvesters in proportion to their catch histories. Otherwise each harvester receives only enough ITQs so that his ACE equals his catch history, and the remaining ITQs go to the government. In the past the government has auctioned both ITQs and ACE. Auctions of ITQs and ACE in 2004 and 2005 raised revenue totaling about US\$3 million.¹⁶

MFish commissioned a study in 2005 to review options for auctioning government-held quota.¹⁷ The study compared different auction mechanisms using various criteria, including to what extent the auctions resulted in efficient initial allocations, whether they provided quality price information, how much revenue they raised, their transparency and simplicity, and their acceptance by industry. The study also addressed the logistical and practical implementation of different auction approaches. The study concluded that a sealed-bid auction would be much easier to implement than an ascending auction. The study then compared pay-your-bid versus uniform pricing for sealed-bid auctions, but did not express a preference.

Bidding in the most recent New Zealand fisheries auction for ITQs in over 100 fish stocks closed in February 2006. This was a standard sealed-bid auction with pay-your-bid pricing. The auction was administered by Commercial Fisheries Services Limited (FishServe)¹⁸, an industry-owned organization that serves as the government's quota

14 See Straker et al. (2002) and National Research Council (1999) for summaries of New Zealand's quota management system for marine fisheries; see Gardner Pinfold (2005) for a summary of its use of auctions to allocate fishing privileges.

15 MFish commercial fishing website: <http://www.fish.govt.nz/commercial/index.html>

16 Results of ACE auction: <http://www.fish.govt.nz/commercial/info/ace-tender.html>; results of ITQ auction: <http://www.fish.govt.nz/commercial/info/crown-tender.html>.

17 See Garner Pinfold (2005).

18 FishServe website: <http://www.fishserve.co.nz/>

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broker and administers some aspects of the QMS. Bidders were instructed to enter their bids on official bidding forms and submit them to FishServe by the auction's closing date.¹⁹ Withdrawal of bids was permitted prior to the close date, after which MFish acceptance of bids at specified quantities and prices was binding.

Auction instructions stated that MFish would set a reserve price for each fish stock and was unlikely to accept bids below the reserve price, but that MFish reserved the right to accept any bid. These reserve prices appear never to have been published. Many species of fish had well-developed secondary ITQ and ACE markets prior to auction, which appears to have helped MFish set reserve prices. Earlier New Zealand fisheries auctions have been conducted using similar auction approaches.

U.S. SO₂ permits

Title IV of the 1990 Clean Air Act Amendments established a national cap-and-trade system to control sulfur dioxide (SO₂) emissions, which are generated by the burning of fossil fuels, such as coal and natural gas, and are a component of acid rain. The SO₂ program is administered by the Environmental Protection Agency (EPA) and began limiting SO₂ emissions in 1995.²⁰ The program caps total emissions from power plants nationwide and requires that each facility hold a permit or "allowance" for each unit of SO₂ that it emits. The cap on emissions is analogous to the TAC in a limited access fishery program, and allowances are analogous to annual fishing privileges. Facilities are allowed to buy and sell allowances.

Annual allowances are allocated to electric generating units that began operating in 1995 or earlier in proportion to their historical consumption of fossil fuel energy. Units that began operating in 1996 or later do not receive annual allocations and must purchase allowances in the secondary market or in auctions. Together with trading in the secondary market, auctions promote price discovery and provide a way for newer electric generating units to obtain allowances.

The EPA sets aside a reserve of approximately 2.8 percent of each year's allowances for auction. EPA returns the proceeds earned on the 2.8 percent of allowances it withholds for auction on a proportional basis to those units from which EPA originally withheld allowances to create the auction reserve. The SO₂ allowance auctions therefore raise no revenue for EPA. Half of the auctioned allowances are sold in "spot auctions" just prior to the first year in which they can be used, and the other half are sold in "advance auctions" seven years prior to the first year in which they can be used. Successful bidders in the most recent EPA spot auction in the spring of 2006 paid a total of over \$110 million, while successful bidders in the advance auction paid a total of over \$34 million. Total payments of about \$145 million were nearly five times larger in real terms than in 2000.

¹⁹ New Zealand fishery auction bidding form:

http://www.fishserve.co.nz/news/Tender_Document_2006_01.pdf

²⁰ EPA Acid Rain Program: <http://www.epa.gov/airmarkets/arp/index.html>

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The EPA offers the allowances it sets aside for auction with a reserve price of zero. EPA *spot* auctions also allow participation by non-EPA sellers. This leads to two-sided auctions with where buyers submit sealed bids to purchase allowances,²¹ and sellers can submit sealed offers to sell allowances.²² Bids are ordered from highest to lowest price to form an aggregate demand schedule, and offers are ordered from lowest to highest price to form an aggregate supply schedule. Then bids and offers are matched, starting with the highest bids and lowest offers, with trade occurring at the buyer's bid. Matching stops at the point where aggregate demand meets aggregate supply. This strange pricing rule creates an incentive for sellers to bias their offers downward—perhaps even below the value to them of keeping the allowances—to be matched with the highest bidders. It turns out that this issue usually is irrelevant, however, because few allowance holders submit offers to sell their allowances. In fact, no such offers were submitted in 2005 or 2006. Nonetheless, Councils that contemplate using two-sided auctions for fishing privileges should use uniform market-clearing pricing. EPA advance *auctions* are standard (i.e., one-sided) sealed-bid auctions with pay-your-bid pricing.

Marketable U.S. Treasury securities

To finance the debt of the U.S. federal government, the Treasury Department sells Treasury bills, Treasury notes, Treasury bonds, and Treasury Inflation Protected Securities (TIPS) at more than 150 auctions held throughout the year.²³ These securities are marketable, meaning that they are fully tradable in secondary markets. At almost 4.4 trillion dollars in total bids accepted last year, these are by far the largest auctions in dollar terms conducted by the federal government.²⁴ The U.S. treasury typically raises from 6 to 24 billion dollars in total face value at each auction. Each auction offers a fixed total face value of a single kind of bill, note, or bond. Treasury auctions are similar to fishing privilege auctions in that the auction must allocate a fixed number of identical assets.

Treasury auctions allow two types of bidding: competitive and noncompetitive. Each competitive bidder enters a single bid in the form of the lowest interest rate the bidder is willing to accept and a dollar amount for the total face value desired. Noncompetitive “bidders” state only the total face value they wish to purchase and accept whatever market-clearing interest rate results from the auction. Investors who do not consider themselves expert securities traders usually bid noncompetitively. In recent years, the

21 EPA SO2 allowance bidding form: <http://www.epa.gov/airmarkets/forms/auctions/2006BidForm.pdf>

22 EPA SO2 allowance offer form: <http://www.epa.gov/airmarkets/forms/auctions/2006OfferForm.pdf>

23 Treasury bills are short-term government securities with maturities ranging from a few days to 26 weeks (http://www.treasurydirect.gov/indiv/products/tbills_glance.htm). Bills are sold at a discount from their face value, and do not earn interest. Treasury notes are government securities that have maturities of 2, 3, 5 and 10 years and earn interest every six months (http://www.treasurydirect.gov/indiv/products/tnotes_glance.htm). Treasury bonds have a term longer than 10 years, up to a current maximum of 30 years. Bonds earn interest every six months. TIPS are marketable securities whose principal is adjusted by changes in the Consumer Price Index.

24 As determined from 2005 data available at <http://www.publicdebt.treas.gov/of/ofaicqry.htm>. February 27, 2006.

volume of non-competitive bids has averaged between 10% and 25% of the issues sold. Individual bidders cannot bid noncompetitively for more than \$5 million in any one auction. Offering a noncompetitive bidding option may be useful in some limited access fisheries in which there are a number of small operators who are not comfortable with bidding. Fishery managers must ensure, however, that there are enough competitive bidders to set an efficient price.

The Treasury posts its tentative schedule of auctions, and then confirms the date and time a few days in advance. All auctions are open to the public. The Treasury accepts sealed bids until the cutoff date. After the cutoff, a computer system ranks the interest rates offered by competitive bidders (noncompetitive bidders do not offer interest rates). The system identifies the set of winners such that the total face value of winning competitive bids plus the total of all noncompetitive bids matches the total face value that the Treasury intended to auction. In this single-price auction, all successful bidders are awarded securities at the interest rate equivalent to the highest accepted rate of the accepted competitive bids. Thus, Treasury may reject a competitive bid, grant the bidder in less than the amount requested, or grant the bidder the full amount requested.

Treasury conducts only single price (i.e., uniform price) single round auctions. About eight years ago, Treasury converted from a multiple price (pay-your-bid) approach to single price auctions. The rationale for this change was that bidding in a single price auction is less risky and helped bidders avoid a “winner’s curse.” If bidders are more comfortable bidding aggressively, then in theory the Treasury could raise the required funds at lower total cost. Empirical evidence suggests that this was indeed the case.²⁵ In addition, analysts argued that since single price auctions are strategically simpler, bidders may be more inclined to bid directly in auctions rather than through specialized dealers. This behavior leads to lower transactions costs and a more efficient system.

One important feature of the Treasury bill market is the robustness of the secondary market. Investors who want to buy bills other than at regular auction and those wishing to sell their bills prior to maturity may do so easily, and with low transactions costs. The secondary market in Treasury bills is the largest and most efficient of any money market instrument. The secondary market in bills is maintained principally by a group of security dealers known as primary dealers. All Treasury bills are now issued and held electronically, which facilitates secondary transactions.

U.S. radio spectrum

In 1993, the Federal Communications Commission (FCC) received the statutory authority to use competitive bidding to allocate radio spectrum licenses. Prior to this historic legislation, the FCC mainly relied upon comparative hearings and lotteries to select a single licensee from a pool of competing applicants for a license. In general, the licenses

²⁵ <http://www.treas.gov/offices/domestic-finance/debt-management/auctions-study/upas2.pdf>
Uniform Price Auctions: Update of the Treasury Experience. 1998.

allow users to broadcast radio signals in certain frequency bands, at specified maximum power levels, in specified locations. Some licenses have other restrictions, such as what kind of service can be provided with the airwave access.

FCC auctions are open to any eligible company or individual that submits an application and upfront payment and is found to be a qualified bidder by the FCC. FCC auctions are conducted electronically and are accessible over the Internet. The Commission has found that spectrum auctions are more effective than either comparative hearings or lotteries. Also, by using auctions the FCC has greatly reduced the average time from initial application to license grant.

The FCC applies some of the most complicated auction approaches used by the federal government. In its simultaneous multiple-round (SMR) auctions, all licenses are available for bidding throughout the entire auction, thus the term “simultaneous.” SMR auctions have discrete, successive rounds, with the length of each round announced in advance by the Commission. After each round closes, round results are processed and made public. At that time bidders learn about the bids placed by other bidders. This provides information about the value of the licenses to all bidders and increases the likelihood that the licenses will be assigned to the bidders who value them the most. The period between auction rounds also allows bidders to adjust their bidding strategies. In an SMR auction, there is no preset number of rounds. Bidding continues until a round occurs in which no bids have changed, at which time the auction closes. Depending on the auction design, number of bidders, and the number of licenses being offered, an auction might run from one day to several weeks.

The FCC SMR auctions are different than the multiple round clock auctions discussed above. In particular, the set of licenses that the FCC auctions simultaneously are not necessarily identical items, and bidders bid individually on each license with an individual price. The two kinds of auctions also have different rules about how a bidder must change or can change bids from one round to another. Also, while not an inherent property of the auctions, the FCC has generally revealed the bidder identities during SMR auctions but not during clock auctions. The FCC is planning to move to anonymous bidding for its next major auction (AWS-1 with 90 MHz), so this difference will not persist.

The FCC experience is quite instructive for fishery managers who are concerned about the distributional effects of auctions. Required by law to seek diversity in granting licenses, the FCC has given preference in auctions to certain categories of bidders, called “designated entities.” Designated entities have generally included small, minority-owned, and women-owned businesses. The preferences have taken different forms. One approach was to offer designated entities a lower down payment and more time to pay for their winnings, with a low interest rate on the unpaid balance. Small businesses also received a 25% bidding credit, meaning that they actually paid only 75% percent of their winning bid. Although such approaches may seem like fairly simple ways to promote

distributional goals, the results of the preferences are controversial, possibly quite costly, and ultimately ineffective.²⁶

First, the evidence suggests that credits for bidding have led to designated entities' bidding up the prices for everyone else. Second, the value of the low interest loan also appears to have been capitalized into the price of the licenses. Third, some designated entities got in over their heads and defaulted on their bids, leading to delay and litigation. Finally, regulators have become concerned that large firms have been using small firms as "fronts" in the bidding. These issues have generated unpleasant press and credibility problems for the FCC. In conclusion, the lesson to fishery managers from the FCC's experience is that adjusting auction rules for certain classes of bidders is not likely to be an effective way to produce a more socially desirable outcome. If necessary, it would probably be preferable to reserve a share of privileges for direct allocation to certain groups.

Oil and gas leases in the U.S. Outer Continental Shelf

The U.S. Department of the Interior's Minerals Management Service (MMS) leases out access to certain oil and gas reserves in the outer continental shelf (OCS). The OCS is the submerged lands between three miles and about 200 to 300 miles from U.S. shores. State governments control the areas from the shoreline to three miles out. The leases grant the right to explore, develop, and produce oil and/or natural gas for a specific period of time from a specific tract of the OCS land. MMS collects about \$5 billion per year in lease payments (called "bonuses"), rental payments, and royalties from OCS minerals.²⁷

MMS schedules its offshore leasing according to a five year plan, an elaborate document that considers environmental factors, regional equities, projected energy demand, and other stakeholder interests. Once the agency issues a final notice of sale, firms may submit their sealed bids. Bidders can bid on any or all of the tracts offered. After the cutoff time, the agency opens and reads the bids publicly. MMS evaluates the bids for each tract individually (i.e., not allowing for combinatorial bidding), making sure that the high bids are legally and technically sound and that no anti-trust issues arise. The high bids are compared against a "fair market value" (i.e., reserve price) that the agency computes for the tracts. The government accepts the high bids (i.e., lease bonuses) that meet the fair market value test and grants the leases.

The lease agreement (disclosed before the bidding) specifies certain payments to the government in addition to the lease bonus paid at auction. Two additional payments generally apply. An annual rental payment applies until the production of minerals begins. Rental payments are generally \$5 to \$6.25 per acre for shallower water, \$7.50 to

²⁶ See a critique of the designated entity approach by Hazlett and Boliek, 1999, at <http://www.law.indiana.edu/fclj/pubs/v51/no3/BabMac17.PDF>

²⁷ A recent write-up of the OCS program appears in "Leasing Oil and Natural Resources: Outer Continental Shelf," by the U.S. Department of the Interior's Minerals Management Service, available at <http://www.mms.gov/ld/PDFs/GreenBook-LeasingDocument.pdf>.

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\$9.50 for deeper water, and more for Alaskan waters. After production begins or achieves a specified level, the lessee generally must pay the government a royalty (a percentage of the value of the mineral) for each unit of production, usually 11% to 17%. Rental and royalty payments reduce the amount that bidders will be willing to pay up front in auctions.

As long as the lessee is producing minerals from the tract, the lease is extended. When a field can no longer be produced economically and the lease expires, the lessee must plug and abandon all wells and remove the platform and any sub-sea devices.

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