This section presents the basic "nuts and bolts" of limited access, carrying the discussion of limited entry beyond the general considerations reviewed in previous sections to look at specific elements. A proposed checklist of items for consideration, along with a brief description of the main options is presented in Figure 1 below. Seven basic decision categories are:

1. Scope of the fishing activity to be restricted or allocated
2. Method of limiting access
3. Initial allocation of harvest rights
4. Transferability of harvest rights
5. Longevity of harvest rights
6. Mechanisms for adjusting the number of harvest rights
7. Handling disputes regarding issuance and transfer of rights.

In the absence of limited access to the fishery, any U.S. resident who pays the appropriate fees to State authorities has a right to fish for groundfish. This right is circumscribed by the various restrictions on commercial gear (e.g., trawl net minimum mesh size), by fishing season closures, by "trip limits," by incidental catch allowances, and prohibitions on retaining salmon and halibut. There is no legal restriction, however, on who can participate at any given time or place, and no specific restriction on the amount that any individual can legally land during a given fishing season. Thus, while there are many restrictions on fishing practices, current fishing rights are unlimited in number, unrestricted in total harvest amounts, and very inexpensive for the individual to maintain.

The discussion of elements in Figure 1 will focus on a trawl license limitation proposal developed in November 1984 by the Fishermen’s Marketing Association and Coast Draggers Association (FMA/CDA) (see Appendix A). Although that proposal is called a moratorium, it has the essential features of a license limitation program. Of interest here is the contrast between the features outlined in that specific proposal and the alternatives listed in Figure 1. We will proceed through each of the seven categories.

SCOPE

The FMA/CDA proposal envisions a relatively narrow scope for the license limitation program in some respects (limited to trawl vessels) and a rather broad scope in other respects (covers entire coast and all species of groundfish listed in the management plan (Pac. Fish. Manage. Counc. 1982)). It leaves out all other commercial gear types and recreational fishing. Except in southern California, the recreational component of groundfish catch is too small (and will probably remain too small) for this exemption to matter much. Ignoring other gear types, however, is a more substantive deletion. Although trawl gear dominates the total catch, gillnet fishing is apparently on the rise and may portend greater competition for fish and space in the future. One strength of this approach is that it limits the most important element of the commercial fleet while minimizing the number of individual fishing operations that must be regulated.

By including all groundfish species and all fishing sites on the west coast, the FMA/CDA proposal would preserve great latitude in trawl fishing operations. Trawl vessel operators have suggested that they need to have many options open to them under any regulatory system. Geographic area and fish species availability are two dimensions to these "options," but there are others. For example, with a large fishing fleet and great latitude in fishing
Figure 1—Limited Access Program Elements and Options

<table>
<thead>
<tr>
<th>Scope of fishing activities to be restricted or allocated</th>
<th>Competitive market allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Types of fishing to be included</td>
<td>1. Ascertain limited number of fishing licenses or IFQs.</td>
</tr>
<tr>
<td>1. All commercial and recreational</td>
<td>2. Sell licenses or IFQs at prices calculated to reflect market values.</td>
</tr>
<tr>
<td>2. All commercial plus for-profit party and charter boat fishing</td>
<td></td>
</tr>
<tr>
<td>3. All commercial fishing</td>
<td></td>
</tr>
<tr>
<td>4. Only &quot;big-time&quot; commercial operations, such as those landing at least 50 tons of groundfish per year.</td>
<td></td>
</tr>
<tr>
<td>B. Geographical extent</td>
<td></td>
</tr>
<tr>
<td>1. All Pacific coast including all seas within the EEZ</td>
<td></td>
</tr>
<tr>
<td>2. All Pacific coast coastal and offshore fishing grounds</td>
<td></td>
</tr>
<tr>
<td>3. Pacific coast offshore harvests from the 3-200 nautical mile zone (CCZ, excluding state waters).</td>
<td></td>
</tr>
<tr>
<td>4. Harvests in certain selected IFQ areas such as the Vancouver or Columbia areas</td>
<td></td>
</tr>
<tr>
<td>C. Fishing gear types</td>
<td></td>
</tr>
<tr>
<td>1. All gear including groundfish trawl, hook and line, fish pots, gill nets, and shrimp trawls.</td>
<td></td>
</tr>
<tr>
<td>2. Control only &quot;directed&quot; fishing with trawl gear, fish pots, and gill nets.</td>
<td></td>
</tr>
<tr>
<td>3. Control only the major gear type—trawls (see IFQ Appendix A).</td>
<td></td>
</tr>
<tr>
<td>D. Species of fish</td>
<td></td>
</tr>
<tr>
<td>1. All species listed in groundfish fishery management plan (Pat. Fish. Manage. Counc. 1982).</td>
<td></td>
</tr>
<tr>
<td>2. Include only &quot;important&quot; groundfish species (e.g., rockfish, whitefish, salmon, Dover sole, English sole, petrale sole, Pacific cod, ling cod).</td>
<td></td>
</tr>
<tr>
<td>3. Focus harvest permits or rights on single species or logical groups of species. For example, a &quot;rockfish&quot; permit is a &quot;whiting&quot; joint venture permit.</td>
<td></td>
</tr>
</tbody>
</table>

II. Means of limiting access to the fishery

A. License limitation

1. Personal license to fish (with or without limiting to "natural persons").
2. License attached to vessel.
3. License attached to gear (e.g., net).
4. Dual system: fishing license for people plus vessel or gear permits.

B. Individual fisherman quota (IFQ)

1. IFQ conveys right to take a share of the allowable yield of specific stocks.
2. IFQ conveys right to take annually a specified quantity from a specific stock.
3. Annual yield is assigned to a company or fisherman's cooperative to be subdivided among fishermen. ("Enterprise quotas").

C. Taxes, royalties and fees

1. Set initial entry fees high enough to discourage excessive participation.
2. Establish landing royalties for fully utilized species.
3. Establish annual license renewal fees.

III. Basis for initial allocation of harvest rights

A. Administrative assignments

1. Include all persons or firms with recent record of landings (e.g., landed at least one fish in the past five years).
2. Include all applicants within a specified time period.
3. Include all persons or firms meeting minimum landings requirements.
4. Hold a lottery among all applicants.
5. Include all persons meeting certain qualifications as commercial fishermen.

IV. Transferability

A. Nontransferable

1. Retirement or death causes termination of fishing license or harvest right; may revert to State to be reissued.
2. Ownership transfer not allowed, but owner may lease or lend fishing right.

B. License or IFQ attached to specific vessel or gear

1. Transfer requires sale of vessel or gear.
2. May be transferred among vessels of equal fishing capacity.
3. May be subject to clearance by State and qualification of new owner.

C. Fully transferable at discretion of owner

1. Market sales may be subject to clearance by State fisheries agency or review board.
2. State may require that new vessel have no more harvest capacity than previously licensed vessel.

V. Duration of term of fishing right

1. Perpetual. The license or IFQ can be used as long as the owner wishes.
2. Annual, renewable or nonrenewable. Renewal could be automatic or could depend upon continued participation in fishery.
3. Dependent upon lifetime or career of permit holder. License or rights expire upon death or retirement of holder.
4. Fixed multiyear term. License or IFQ might confer right to fish for, say, 10 years.

VI. Means of altering number of licenses or fishing rights

A. Filer reduction

1. Attrition through retirement, termination, revocation for cause.
2. Buy-back of perpetual or long-lived licenses by State or Federal agency.
3. Automatic expiration of fixed-term licenses in conjunction with issue or sale of reduced number of new licenses.

B. Increase in number of licenses or rights

1. Lottery among "qualified applicants".
2. Sale to applicants at agency-established price.
3. Selection of new licensees on first-come, first-served basis.
4. Auction of new licenses or rights in competitive market open to all.

VII. Settling disputes regarding issuance and transfer of fishing rights

A. State/Federal Court

Fishermen can ultimately seek redress in the courts under any of the options.

B. Administrative Law Judge (ALJ)

1. ALJ could make a final administrative ruling after hearing with fisherman.
2. ALJ could make recommendation to agency administrator after hearing issue.

C. Special Appeals or Review Board

1. A board of peers (industry representatives) could make rulings or recommendations to agency administrator.
2. A board of disinterested citizens could hear disputes.

D. Agency Administrator

1. Administrator could make final rulings for agency (e.g., NMFS Regional Director).
2. Administrator could be bound to pass issue to Federal department head.
options, current fish stock conservation regulations have limited
the ability of trawl vessels to choose timing and quantity of rockfish
to catch by imposing trip limits and season closures.

Three alternatives to the FMA/CDA proposal merit considera-
tion are (1) including all gear types in the license limitation pro-
gram, (2) limiting the scope to "major" groundfish species, and
(3) permitting small catch levels by unlicensed vessels. Extension
to all gear types would increase the size of the licensed fleet by
an order of magnitude, but would bring the various fixed gear vessels
under control early. This would address the potential future prob-
lem of expanding harvest capacity by an unregulated portion of the
fishing fleet. Second, the idea of licensing only those vessels fishing
"major" species would alleviate the need to include in the limited
fleet every vessel that catches an occasional spiny dogfish or soup-
fin shark. Without restricting the program to major species, the
extension to all gear types would undoubtedly make the system too
all-inclusive and cumbersome.

A third option might be to allow unlicensed vessels to land ground-
fish below a certain limit. All unlicensed vessels could be allowed,
for example, to land up to 1,000 pounds of groundfish on any trip,
or up to 10,000 pounds per year. This would permit the minor in-
cidental catch of groundfish by trollers, shrimp vessels, and purse
seiners without adding these vessels (and the redundant harvest
capacity they might represent) to a permanent licensed groundfish
fleet.

MEANS OF LIMITING ACCESS

The FMA/CDA proposal is for a groundfish fishing license attached
to the vessel. The principal alternative form of licensing, the per-
sonal fishing license, has been adopted in Alaska and elsewhere.
The choice between these two license alternatives should have some
effect on relative bargaining strengths of vessel owners and
fishermen. With personal licenses limiting the number of people
who can legally fish, ownership of capital equipment is not a pre-
requisite for ownership of fishing rights. In the Alaska salmon case,
personal fishing licenses cannot be used as collateral for loans and
cannot be owned by corporations. These provisions were supposed
to protect licensed fishermen from some possible threats to their
continued participation in the fishery. Vessel owners might object
to this because their ability to continue receiving income from a
capital investment would depend upon success in recruiting a
licensed crew.

Choice between attachment to individuals or vessels must be made
in designing IFQs as well. If the 10,000-ton allowable bycatch for
sablefish were allocated as 500 20-ton IFQs, these could be assigned
on the basis of historical share to fishermen, to vessel owners, or
even to corporations involved in fish processing. With personal
IFQs, a trawl vessel owner would need to hire a skipper or crew-
member holding an IFQ, with share assigned to vessels the owner
would have control of the harvest right and fishermen not owning
vessels would be at a disadvantage; and with corporate ownership
of shares the processors could more easily plan and manage the
fleet fishing for them.

A sub-option for IFQs is partial implementation of the system
for a subset of groundfish stocks. One could allocate the estimated
annual allowable catch of widow rockfish, sablefish, or Dover sole
while leaving other species out of the IFQ system. Also, as sug-
gested by Robert Stokes (1983) in his study of north Pacific halibut,
one could establish IFQs for a portion of the total harvest of a given
species while retaining a communal fishery for the remainder of
the harvest. This option has the advantage of providing a choice
to fishermen who, for whatever reason, do not want to join a quan-
titative rights system. If one-half of the traditional harvesters of
Dover sole object to an IFQ system, one could distribute IFQs for
half the annual yield to those wishing to join the system. The tradi-
tional harvest sector would fish from January 1 until one-half of
the annual allowable bycatch is taken. Fishermen with IFQs could
catch whenever they wish, and would probably time their harvest
to maximize its landed value.

INITIAL ALLOCATION OF
FISHING RIGHTS

The FMA/CDA proposal would allocate trawl licenses only to cer-
tain groundfish trawlers (1) landing at least 100,000 pounds or (2)
making at least 12 deliveries during 1984 or (3) demonstrating to
an industry-governing Board that they had prior involvement in the
fishery and were active in the north Pacific or Bering Sea trawl
fishery in 1984 or (4) demonstrating to the Board that they signed
a contract or began construction or conversion of a trawl vessel
during 1984. These qualifications would exclude very few ground-
fish trawl fishing vessels from the licensed fleet. For that reason,
this initial allocation of harvest rights would create no significant
reduction in harvesting capacity.

Whether licenses or IFQs are considered, the basic choice here
is between administrative assignment and some kind of "market
allocation." Administrative assignments are universally chosen in
existing limited access programs, largely because government
agencies (and legislators) are reluctant to take away historically
established fishing rights. As noted in the Introduction, when
government regulations are designed to correct technical problems
of communal resource usage, use rights are generally assigned to
actual, historic users in order to avoid causing a redistribution of
wealth. However, when developing new resources (offshore oil)
or distributing public resources not previously used (National Forest
timber), government mechanisms tend to use more market-oriented
allocations (auctions and royalties) which extract resource value
from the users.

A case could be made that both historic use and new uses are
found in the Pacific groundfish fishery. Extensive historic use of
most flatter, rockfish, and sablefish by commercial fishing fleets
could establish an informal "ownership" of the right to harvest.
At the same time, however, new or developing fisheries have no
such specific historic use. Pacific whiting, shortbelly rockfish, sand-
dabs, and possibly other groundfish stocks would be essentially
"new" from this perspective. A mix of administrative and market
allocation of initial harvest rights could be justified on this basis.
Ultimately, there is no technically correct answer to the initial alloca-
tion question. Distribution of public resources can and has been
done in many ways.

TRANSFERABILITY OF
HARVEST RIGHTS

Under the FMA/CDA proposal, the trawl licenses would be trans-
ferred with sale of the vessel and could be shifted from one vessel
to another by the owner if the licensed vessel is lost or if the owner
wants to "upgrade" or "downgrade" his vessel. Although the license
itself would not be salable under this system, it would be
fairly easy to perform almost any kind of transfer. For example,
MECHANISMS FOR ADJUSTING NUMBERS OF HARVEST RIGHTS

Under the FMA/CDA proposal, the number of trawl licenses, once established, would change only where individual owners allowed their licenses to lapse. Because these licenses would be potentially valuable in the future, it would be unlikely that significant numbers of vessel owners would voluntarily withdraw from the licensed fleet. Assuming that there will be slow attrition from the trawl fishery, the FMA/CDA proposal calls for an annual review of the size and condition of the fleet. No specific procedures are included, however, for either causing more rapid decrease in the fleet or for increasing the number of licenses at some future time.

To achieve an economically efficient fleet size, some reduction in number of vessels would be necessary under a license limitation program. On the other hand, an expansion of the currently developable fisheries for Pacific whiting and short-nosed rockfish might justify adding to the fleet.

For fleet reduction, attrition and buyback programs are the only frequently discussed alternatives. For attrition to have much effect, there must be fairly stringent annual requirements for renewal of licenses, and the licenses must not be transferable to new fishermen. This approach, therefore, seems to impose a rather arbitrary distribution of fleet reduction burden among fishermen. Also, while waiting for attrition to take its toll, many fishermen may be led to remain in the fishery when they should not for health or safety reasons.

Buyback of vessel licenses provides a positive means of reducing the number of vessels, but it requires a source of funding. In their extensive review of buyback of fishing rights, Schelle and Muse (1984) found only one that was not a government subsidized program. On the other hand, an expansion of the currently developable fisheries for Pacific whiting and short-nosed rockfish might justify adding to the fleet.

In view of the long-lived investments inherent in both fishing vessels and fishing know-how, there seems to be no logical reason for licenses or IFQs to expire annually or over a short period of years. The FMA/CDA proposal allows perpetual trawl licenses. Only if a vessel owner fails to meet minimum landing requirements and fails to seek an exemption for his vessel, would a license be automatically retired. Personal licenses in Alaska and elsewhere are also perpetual. The Pearse Commission recommended that British Columbia salmon licenses be issued for a 10-year term, but this proposal was part of an intended fleet reduction program that would end with issuance of a smaller number of perpetual licenses.

In a limited access program incorporating all gear types, however, it might be useful to issue short-term licenses to vessels that really intend to fish only for a short time or which temporarily exceed some maximum harvest level allowed for unlicensed vessels. With a fully marketable IFQ system, anyone wanting to temporarily enter or leave the groundfish fishery would have the opportunity to do so.
might arise under such a system in the absence of any experience with it or a specific proposal.

HANDLING DISPUTES

Disputes are likely to arise concerning the initial allocation of harvest rights (whether licenses or IFQs), and in exercising the mechanisms for license transfer, renewal and termination. Most existing license limitation programs avoid disputes regarding initial allocation by including almost every conceivable claimant. Alaska's salmon license program did not, much to the chagrin of the Commercial Fisheries Entry Commission. The Alaska system required the Entry Commission to establish means of determining the extent to which applicants met various criteria concerning historic participation and dependence on the fishery. Challenges to the Commission's procedures and decisions still, after 10 years of operation, constitute a significant portion of the Commission's business. This could be avoided by establishing quantitative criteria in law or regulation at the outset, rather than leaving interpretation of some vague criteria to a quasiregulatory body.

To deal with the disputes that occur, several alternative procedures could be established. A review board dominated by fishermen and other industry members could decide whether individuals should be given licenses and whether proposed license or vessel transfers should be allowed. A variant on this is to use the board to make recommendations to an agency administrator (e.g., an NMFS Regional Director) who would make an official ruling. Fishermen affected by decisions of the Board may feel that they will get a more sympathetic hearing before their peers than before a nonfishing administrative or judicial panel. On the other hand, both fishermen and the public-at-large occasionally may fear that conflicts of interest or favoritism are more likely to affect the decisions of an industry-dominated review board.

Other approaches could include use of an Administrative Law Judge to hear evidence and make recommendations or rulings. Agency administrative procedures could be used to hear grievances and make rulings. In any case, a fisherman has access to the courts to seek redress of arbitrary or wrongful actions by the management agency.

CONCLUSIONS

A tremendous variety of combinations of limited access program elements can and have been attempted. This chapter has introduced and explained many of the most commonly discussed alternatives under seven categories. Further innovation in developing variants on these alternatives will surely be an activity for fishermen, managers, and scientists involved in limited access programs.