RECOMMENDATIONS FOR MINIMUM SIZE LIMITS ON CERTAIN FISHES

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Fish and Wildlife Service

United States Department of the Interior

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INTRODUCTION

This discussion and the recommendations which follow have been prepared at the request of the Atlantic States Marine Fisheries Commission. This request originated because of the alarm of some conservationists at the rapid growth of the "trash" fish industry which is using fish for meal and oil. This industry was reported to be using small sizes of edible species in addition to the "trash" fish. However, the small fish problem has been a part of the established fishing industry for many years and numerous recommendations have been made by the Fish and Wildlife Service.

In reviewing and supplementing these recommendations, it is desirable to discuss first the reasons for applying a minimum size limit and other measures which must accompany a size limit.

Minimum size limits have been very popular and have been widely used in fishery conservation because it is generally accepted that it is undesirable to catch small fish. The effects of their use and abuse have been investigated recently through a number of researches on both marine and fresh-water fishes. It has been found that minimum size limits are frequently not necessary and may, in fact, be harmful. Therefore, such a measure should be applied only when the problem is clearly understood and when the effects can be predicted.

A minimum size limit should be considered for one or both of two reasons. The first is to prevent the landing of those sizes of fish which the market ordinarily does not want. Occasionally, when fish are scarce, small fish will bring a moderate price when at other times they are worthless. Fishermen, being optimists and being unable to predict when the fish might be of value, will tend to catch them and ship them in sizes smaller than desired. In this case, the minimum size limit is an arrangement which helps to standardize the practices in the fishery.

The second reason for applying a minimum size limit is for conservation. If conservation is taken to mean the production of a maximum sustained catch, then a minimum size limit will be useful only when certain conditions prevail.

The first of these conditions is that the fishing industry must catch the sizes of the fish most valuable. If the young are more valuable than the adults, as is the case with the sea herring in Maine then a minimum size limit can not reasonably be considered.

A second condition is that during the period when the fish are protected by the size limit they must gain by growing more rapidly than they lose by dying. It is futile to protect small fish which grow slowly and die off so rapidly that they are not available for capture.

A third condition is essential after the second has been fulfilled. The fish must ultimately be caught or contribute to the spawning stock. They must not have migrated to inaccessible banks and they must be fished intensively enough to insure the capture of most of them. That they be available for capture later is as important as that they contribute to the spawning stock. According to recent researches it has been found that most species of fish have a large reserve of spawn. A few spawners can produce enough young to make use of the available space and food, and are capable of producing a large crop of adults.

But even if these conditions are met, the minimum size limit will be effective only if it prevents the young fish from being killed. Preventing them from being landed or sold is not enough since small fish, once caught, are virtually all killed in the usual fishing operations. Thus some means must be found to prevent the young from being caught.

A minimum size limit alone, in certain fisheries, may be moderately effective in preventing the capture of young fish. This will be the case when it discourages fishermen from fishing where there are such concentrations of small fish that it is too much work to sort out the few marketable ones. Usually, however, small fish are mixed with larger quantities of marketable fish and fishermen must catch them if they are to get a fare. This was shown conclusively by the trawl fleet operating on Georges Bank in 1947, when they destroyed and discarded at sea 17 million young haddock while bringing in to market 42 million of larger size.

Most small fish will escape through larger meshes. This has been shown by repeated experiments which compared mesh of different sizes. The most elaborate of these experiments was one in which British sister ships fished alternately with large and with small mesh for a period of a year. The large-mesh net allowed most small fish to escape, but actually caught fish worth slightly more money than those taken with the smaller mesh.

Some fishermen argue that the meshes close up when the net is towed, but their actual practice weakens their argument. They regularly use a small-mesh liner to catch slender fish, such as small hake and whiting, and also use a large mesh to avoid trash when fishing with a limited crew for broad fish such as fluke or yellowtail flounder.

However, the fisherman's argument that large mesh will catch small fish has some basis, for large mesh will catch some small fish. Our experiments on haddock show that the recommended mesh, which will permit most small haddock to escape, will still catch about 20 percent of the small fish (this would usually be less than 5 percent of the total catch) which entered the net and which became entangled with the mass of other fish. This proportion of small haddock would be killed, and having been killed, might as well be landed. (Preventing waste is conservation, too.)

Therefore, the minimum size limit must not be absolute prohibition against the landing of small fish. There must be a tolerance which would permit the handling of that small percentage of the catch which was small-sized fish, but which was unavoidably caught by the fishermen using large mesh.

The use of large mesh, however, is simply not practical in some fisheries. When several species of fish are sought that have different body shapes, there will be a great difference in the size which will escape. For example, a mesh permitting an eleven-inch yellowtail flounder to escape will allow a far larger red hake to escape. If the fisherman is seeking "trash" fish which consists largely of red hake, then he cannot use a mesh which will permit undersized yellowtail flounder to escape.

In the trap fishery, too, a large mesh in the net is impractical. The fishermen may get successive runs of slender weakfish, broad-bodied butterfish, or scup. If he is to catch the slender fish, he has to catch the small sizes of the broad-bodied fish.

The situation is different in the haddock fishery. The haddock is the principal species sought and the mesh desirable for haddock will also retain the desirable sizes of cod, hake, cusk, lemon sole, etc.

In the light of these facts, it is apparent that each fishery must be considered separately and any regulations must be very carefully designed, if the objective of leaving fish in the sea for future capture is to be achieved. Therefore, our recommendations which follow include a careful discussion of the facts of each case.

MINIMUM SIZE LIMIT FOR HADDOCK

The Fish and Wildlife Service has long recommended a minimum size limit of 16-1/2 inches, (one and one-half pounds) for haddock. This is desirable because:

1. The haddock supports a major fishery on Georges Bank, where it has declined greatly in abundance. This decline is associated with very heavy fishing which is removing about 50 percent of the stock each year.
2. The haddock grows rapidly until it is three years old, when it averages 16-1/2 inches in length.
3. The natural death rate is much smaller than the rate of growth in the early years.
4. Great numbers of young haddock smaller than market size are killed and discarded at sea.
5. The Boston market announces that the minimum acceptable size is one and one-half pounds, but regularly handles sizes down to about one pound (14 inches).

Recent reports of haddock being landed by the tens of thousands of pounds at a size salable only as "trash" fish make a regulation even more desirable. The Fish and Wildlife Service has no information to indicate that this practice is extensive, but it certainly is poor conservation to catch any fish now at one cent a pound when a year from now they could be caught and would average about ten cents a pound.

Thus in the offshore trawl fishery, and possibly in the "trash" fishery, it appears that large numbers of rapidly growing haddock are killed which if saved would grow substantially and be caught later. It is to be noted that the fishermen have used a mesh which retained haddock much smaller than the minimum market size and therefore a minimum size limit must be used with a minimum mesh size. This will be practical only if: (1) a tolerance is allowed to permit those vessels which fish principally for haddock to land a few small haddock; and (2) vessels using smaller mesh principally for redfish or whiting could land a small proportion of haddock. Therefore, we recommend:

1. A minimum legal market size of 16-1/2 inches for haddock. (This measure is from the tip of the snout to the fork of the tail.)
2. An exception to the minimum size limit for up to 5 percent by number of the haddock in the catch.
3. A minimum mesh size of 4-5/8 inches, stretched measure, inside knots, as fished, in the top part of the cod end of the trawl net.
4. An exception to the minimum mesh size for vessels that are either 50 gross tons or less in size or land less than 5,000 pounds of haddock (gutted weight) in one week.
5. Continuing study of the effect of these regulations and granting of authority to the enforcement agency to vary the limits and exceptions within certain limits.

MINIMUM SIZE LIMIT FOR YELLOWTAIL FLOUNDER

Available information on the yellowtail flounder indicates that it supports a heavy fishery on the stock which lives on the southern New England Banks between Nantucket Shoals and Long Island. The abundance and total catch from this stock have declined greatly since 1942. The causes of this decline are not fully understood, but it appears probable that the fishery is so intense that any small yellowtail saved from destruction would be available to the fishery later.

The filleting industry which uses the yellowtail wants them more than 11 inches long. At this length they are in their third year of life and have passed through their rapidly growing period. Also, most of them are sexually mature. The yellowtail flounder, like the haddock, has been reported to be taken occasionally in large quantities at a small size for "trash" fish. No information is available to indicate that this is a widespread practice, but it would not be good for the valuable fillet industry to catch the yellowtail prematurely at one cent per pound. Therefore, we recommend:

1. A minimum size limit of 11 inches on yellowtail flounders.
2. An exception to the minimum size for up to 5 percent by number of the catch of yellowtail flounders.

This recommendation is intended to permit the use of yellowtail flounders exactly as in the past for filleting but to prohibit their use for "trash" fish. It is believed that in this instance a size limit without a mesh size will be useful since yellowtail do not occur in quantity on grounds where the red hake and whiting are abundant. The fisherman seeking "trash" fish can thus avoid concentrations of small yellowtail flounder.

MINIMUM SIZE LIMITS FOR SCUP AND BUTTERFISH

Information is not available on which to base a recommendation for a minimum size limit for the scup and butterfish. These two species have never been intensively studied, and they are of only moderate commercial importance (though locally they may be very important to a few fishermen), and the total catch records show no evidence of abrupt or continuing declines in production (in fact recent catch records for scup indicate a greater production than ever). It is believed that the great fluctuation in the success of individual fishermen is due to the vagaries of migration of these species and not to any overall decline.

It was reported to the Atlantic States Marine Fisheries Commission that these species were included in the catches of "trash" fish. The Fish and Wildlife Service is unable to find that large quantities are being used for "trash" fish and we do not believe that the inclusion of incidental amounts in the "trash" fish catch will affect the future fishery for these species.

MINIMUM SIZE LIMIT FOR WHITING

The whiting supports a large food fishery which is centered in eastern Massachusetts. It is also being caught in large quantities as "trash" for reduction to fish meal. While these might be conflicting uses, there is evidence that whiting is one of the most abundant fishes on the New England banks. Furthermore, most of the whiting which are caught as "trash" are of a size too small for use as food, and they are caught south of Cape Cod where almost none are caught for food. Thus the information, while admittedly scant, indicates that the "trash" fishery may be using an otherwise unexploited fish stock. The Fish and Wildlife Service suggests (and is planning) further study on whiting, but cannot recommend a minimum size limit at this time.

MINIMUM SIZE LIMIT FOR BLACKBACK FLOUNDER

Considerable studies of the blackback flounder which have been made over the past two decades show the following facts relative to a minimum size limit:

1. The species, while it occurs in quantity from New Jersey northward into Canada, is composed of many small individual stocks. Each of these stocks migrates a short distance with the changing seasons, but is available to the same group of fishermen each year. For example, the fish which appear annually in Narragansett Bay are caught almost entirely by Rhode Island fishermen and are not easily available at other times of the year to fishermen in other areas.
2. The principal stocks of blackback flounder occur off New York, Connecticut, Rhode Island, and southern Massachusetts. The production from these several stocks reached a peak in the mid-thirties and has declined greatly. Consequently, it is probable that most of these stocks are subject to heavy fishing and that fish saved from unnecessary destruction would be available to the fishery after they had grown.
3. The desired market size is over 10 inches, but many are caught between 8 and 10 inches by angling, especially in western Long Island Sound and in the Shinnecock and Moriches Bays.

The Fish and Wildlife Service had recommended (in 1940) a 10-inch minimum size for all Long Island waters except western Long Island Sound where a 6-inch limit was recommended, and in Shinnecock and Moriches Bays where a 6-inch limit was recommended provisionally. The data on which the above recommendations were based show that very few blackback flounder between 6 and 8 inches were then caught. Since that date, the State of New York has increased the minimum size limit to 8 inches.

Comparable studies have not been made on other stocks, but samples of the catch show that almost no blackback flounders less than 10 inches long are taken on Nantucket Shoals, while off Rhode Island they are regularly caught for food purposes down to about 8 inches.

Therefore, on the basis of these facts, and assuming that a uniform regulation is desirable we recommend:

1. A minimum size limit of 8 inches on blackback flounder.
2. An exception to the minimum size limit for up to 5 percent by number of the blackbacks in the catch.

This regulation should be reasonably effective without an accompanying regulation on mesh size, since concentrations of small blackback flounder can usually be avoided by vessels fishing for "trash".

EFFECT OF RESTRICTIONS ON THE TRASH FISHERY

This new "trash" fishery which mushroomed during 1949 and which appears to be destined for continued growth, offers both a promise and a threat to the fishing industry of New England. On the one hand it is a new development of great economic importance to small trawlermen, to fish-meal processors, and to fishmeal users. Insofar as it is making use of relatively unexploited fish stocks, it is a boon to the industry, and possibly also to the stocks of edible fish on the banks, which will have more food and more room to grow because of the removal of their competitors.

The threat lies in the destruction of edible species before they are large enough for market. Many such species, notably the haddock, yellowtail, blackback flounder, and rosefish are already subject to heavy fishing. Further fishing on the smaller sizes and sale of them to reduction plants might have serious consequences.

This threat, however, seems not too serious so far. In our samples we have found only a very small percentage of important edible species (except whiting). However, it has been reported to us that large quantities of haddock and yellowtail have been landed occasionally.

Thus, the problem is to safeguard the existing fishery and not to hamper a healthy new industry. The recommendations made previously in this article have been made with both of these necessities in mind, but two more measures are needed to supplement them:

1. Permit the possession, sale, purchase, or offer of sale of haddock, yellowtail flounder or blackback flounder of any size when these species singly or in the aggregate do not amount to more than 5 percent of the catch by number.
2. Provide for continuing study of these fisheries and for modification of the regulations, as scientific studies indicate that modification is necessary to achieve the objectives.

These two provisions are necessary to provide for the small percentage of the catch which the "trash" fisherman cannot sort out, and to provide for the changes which are certain to develop in any new fishery.

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Woods Hole,
Massachusetts.

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