

MEMORANDUM

TO: Council, SSC and AP Members  
FROM: Clarence G. Pautzke  
Executive Director  
DATE: January 3, 1994  
SUBJECT: Total Weight Measurement



<p>ESTIMATED TIME 1 HOUR</p>
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**ACTION REQUIRED**

Receive status report on analysis of total weight measurement and review proposed alternatives.

**BACKGROUND**

NMFS staff will report progress on the analysis of a proposed regulatory amendment to require scales on processor vessels to improve measurement of groundfish catches. They will describe methods of estimating groundfish catch for all vessel and processor types and how to improve them with at-sea scales. They will also summarize the December 14, 1993 meeting with representatives of the fishing and weights/measures industries to discuss NMFS's initial recommendations for performance standards and operational requirements for weighing fish at sea.

The Council can review proposed alternatives to be included in the draft analysis and suggest revisions or additions. NMFS plans to present the draft analysis to the Council at its April, 1994 meeting and, if this draft is released for public review, final action could be taken by the Council in June. Final regulations could be published by January, 1995 at the earliest and, depending on the modifications required, NMFS could allow up to one year for full compliance.

**Status Report to the  
North Pacific Fishery Management Council**

**NMFS's Initial Recommendations for Groundfish Catch Monitoring  
under the Proposed Comprehensive Rationalization Plan**

**SUMMARY**

This report presents National Marine Fisheries Service's (NMFS) initial recommendations for monitoring groundfish catch under the Council's proposed Comprehensive Rationalization Plan (CRP). These recommendations will be presented to the Council in a draft analysis at its April, 1994 meeting.

NMFS believes that the individual fishing quota (IFQ) monitoring system must provide catch information to the vessel operators and to NMFS that will be accurate and timely enough to manage harvests by hundreds of processor and catcher vessels within the annual total allowable catch for each species or species group. The primary element of the recommended catch monitoring program is the requirement that all groundfish for which an IFQ has been issued must be weighed by species or species group prior to discard or processing. NMFS is preparing a draft analysis of a regulatory amendment which would require weighing by species or species group for all processors and for catcher vessels that discard groundfish at sea. We believe these regulations need to be implemented at least one year prior to implementation of the Council's CRP.

This status report provides:

- (1) NMFS's initial recommendations for groundfish IFQ monitoring requirements under the CRP which will be evaluated in the draft analysis;
- (2) discussion of NMFS's concern that the Council's CRP schedule requires the development of total weight measurement regulations which are focused on the needs of CRP rather than on interim management of the open access fishery;
- (3) a summary of the December 14, 1993 meeting with industry to discuss NMFS's initial recommendations for performance standards and operational requirements for at-sea scale systems;
- (4) proposed alternatives to be included in the regulatory amendment draft analysis; and
- (5) a proposed schedule for analysis and implementation of requirements to weigh fish at sea.

## Initial recommendations for CRP catch monitoring requirements

The primary purpose of this IFQ monitoring system would be to provide accurate, verifiable, enforceable, and timely information that will maximize the ability of NMFS to enforce the requirement that a vessel stop fishing once groundfish for which the vessel owner/operator has been issued quota shares has been harvested.

This IFQ monitoring system would be based on **catch measurement** to the extent possible, rather than on **catch estimates**. Catch measurement is accomplished by weighing groundfish by species or species group, as is currently done in shoreside processing plants. Catch estimates are made using many methods including converting the estimated volume of fish in a codend or fish bin to weight using standard density factors; estimating the weight of each species based on observer's species composition sampling; and converting product weight to round weight using product recovery rates. If a processor uses a scale to weigh total groundfish catch, but continues to rely on observer species composition sampling to determine the weight of each species or species group harvested, the result is still a catch estimate.

The uncertainty associated with catch estimates make it difficult to accurately and conclusively establish groundfish catch by species or species group on an individual vessel. In other words, it is more difficult to contest the results of scale weights by species or species group than it is to contest the results of volumetric estimates, species composition sampling, and standard product recovery rates. Catch estimates place the burden on NMFS to demonstrate that the estimates are correct before enforcement actions can be taken. Catch measurements based on scale weights by species or species group will place the burden on the vessel operator to provide NMFS with the information necessary to enforce the IFQs. If a vessel operator fails to accurately report groundfish catches or continues to fish after IFQs have been harvested, they will face enforcement actions.

Following are the major elements of the catch monitoring system that NMFS believes would be necessary to manage IFQs for groundfish:

- (1) all groundfish for which IFQs have been issued would be weighed by species or species group for the purposes of quota monitoring. No groundfish harvested under an IFQ program would be allowed to be discarded or processed until it has been weighed;

- (2) vessels would be required to either provide a scale system capable of weighing groundfish by species or species group or to deliver groundfish to a processor where it could be weighed by species or species group;
- (3) IFQs would be monitored on the basis of the vessel's catch reports from scale records. Vessel operators would be responsible for providing accurate catch information to NMFS and vessels would be required to cease fishing once their reports indicate that their IFQs have been harvested. Observer official total catch estimates from the scale and other vessel records, plus information about the performance of the scale system, would be used to verify the accuracy of the vessel reports; and
- (4) processors would continue to provide information on processed product weight to be used as a secondary source of information about groundfish harvests.

#### **The use of scale systems for management of the open access fishery**

At this time, NMFS is focusing on analysis of regulations necessary to implement the Council's CRP. NMFS believes that the current blend system of quota monitoring is adequate to manage the open access fishery if IFQs are to be implemented by 1997. Processor vessel operators who wish to avoid having standard product recovery rates used to determine their harvests in the current open access fishery may take two observers and provide either (1) certified fish bins for volumetric estimates in the pollock fishery, or (2) scales for total weight measurement in all other groundfish fisheries.

NMFS agrees that current methods of estimating groundfish harvests processed on catcher/processors or motherships could be improved. If the Council were to recommend scale systems on board processor vessels to improve observer estimates of groundfish catch in the open access fishery, NMFS would recommend a total catch weight measurement system based on a single scale to weigh all groundfish harvested. Species composition sampling would continue to be used to estimate the catch by species or species group. This type of scale system could cost up to \$75,000 or more per vessel.

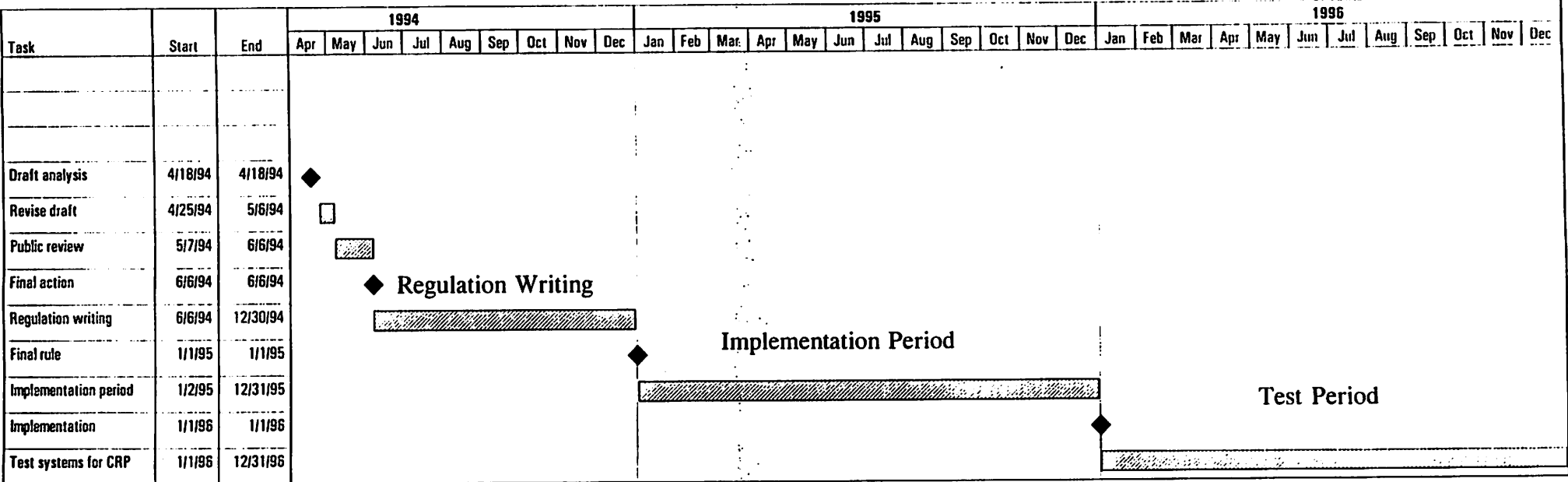
The system required to monitor IFQs will require that each species or species group for which a vessel has a quota be weighed separately and reported by the vessel operators. Quota monitoring will be based on vessel reports and observer data from the scale system will be collected to verify these reports. NMFS

does not believe that species composition sampling by the observer will be adequate to establish the catch by species or species group with enough certainty to allow NMFS to require the vessel to stop fishing in a timely manner. The catch monitoring system necessary for CRP may require more than one scale and considerable changes on processor vessels to provide area for holding fish that have been sorted by species group prior to weighing.

NMFS is concerned that a scale system adequate to improve total groundfish catch measurement in the open access fishery will not provide a "building block" to the scale system required for IFQs, but may be an entirely different system. Knowing that the Council intends to develop a CRP that will likely include IFQs for some or all groundfish species groups, perhaps by 1996 or 1997, it would be difficult for NMFS to justify requiring vessels to pay for scale systems to meet the less stringent requirements of monitoring the open access fishery then, in one or two years, require the industry to make costly changes or upgrades to that system to meet the needs of CRP.

Figure 1 is a possible time schedule for a total weight measurement regulation. If final action is taken on this issue by June, 1994, regulations may be in place by January, 1995. NMFS would allow the industry at least one year to install equipment and reconfigure the vessel to provide for scale weights by species or species group. Scale systems could be in place by January, 1996. If the Council remains on a schedule that results in vessels fishing with individual quotas by 1996 or 1997, the regulations implementing the catch monitoring system would have to be in place by early 1995. Therefore, under a most optimistic CRP time schedule, the date necessary for the IFQ monitoring system to be in place coincides with the earliest possible date NMFS believes any type of scale system would be operational on vessels.

# Figure Possible Time Schedule for a Total Catch Weight Regulation



## **NMFS initial recommendations for at-sea weighing**

NMFS developed initial recommendations for performance standards and operational requirements for weighing fish at sea based on the expected needs of an individual vessel quota fishery as proposed under the Council's CRP. These recommendations were mailed to Council members, the Council's Advisory Panel and Scientific Committee, members of the fishing industry, representatives of scale manufacturers, and other interested parties in mid-November, 1993.

**Performance standards** which refer to specific elements of the scale system that would be required or functions that the scale system must be designed to perform:

1. the scale system perform at a specified standard of accuracy under operating conditions,
2. the scale system be capable of weighing all fish harvested,
3. the scale system be designed to minimize the opportunity for tampering,
4. the scale system provide an electronic and printed record of total catch weights,
5. the scale system be designed so that NMFS certified observers would be capable of independently verifying accuracy under operating conditions.

**Operational requirements** which refer to the use or monitoring of the scale systems by vessel operators, NMFS, or other government agencies.

1. all fish must be sorted by species or species group and weighed prior to discard or processing,
2. scale systems would be required to be inspected annually,
3. if the scale system becomes inoperable the vessel must cease fishing.

## **Consultation with the National Institute of Standards and Technology**

NMFS has been working with the National Institute for Standards and Technology (NIST) and the State of Alaska to learn more about the technical and operational requirements, testing, and monitoring of scale systems used in commercial transactions. NIST works with the National Conference on Weights and Measures to develop uniform national standards for weighing and measuring devices used in commerce. These standards are published annually in "Handbook 44" and are adopted by most State and local weights and measures agencies, including the State of Alaska. For example, scales in shoreside processing plants must meet Handbook 44 requirements.

Policies or regulations adopted by NMFS to govern at-sea scales need to be developed based upon existing requirements governing the use of scale systems in commercial transactions. Consistency with the commercial scale requirements will simplify the process of developing requirements for at-sea weighing and will take advantage of the regulatory framework that has already been established. However, commercial scale requirements will have to be adapted for the unique environment of the at-sea processor and the use of these scale systems will be monitored and enforced by NMFS unless another regulatory agency is specifically included.

NIST also assisted NMFS in identifying scale manufacturers worldwide who were provided information about our need to weigh fish at sea. Approximately ninety scale manufacturers were contacted and invited to participate in development of performance standards governing at-sea weighing. About fifteen companies expressed interest in the project and representatives of nine companies attended the December 14, 1993 public meeting with NMFS and the fishing industry.

### **Public meeting on at-sea weighing**

A public meeting was held in Seattle on December 14, 1993 to discuss weighing fish on board processor vessels. The purpose of the meeting was to initiate discussions with the fishing industry, scale manufacturers, and other interested parties on NMFS's initial recommendations for performance standards and operational requirements for weighing fish at sea. The meeting was attended by about 60 people including fishing industry representatives, scale manufacturers, and government agency representatives. Carroll Brickenkamp, Chief of the Office of Weights and Measures in the National Institute for Standards and Technology (NIST) and Ed Comiskey, Supervisor of the State of Alaska's Division of Measurement Standards attended this meeting.



## **Comments on NMFS initial recommendations**

Following is a summary of comments, suggestions, or recommendations that developed out of the discussions at this meeting.

### **Marine scales can accurately weigh fish at sea**

Representatives from nine scale manufacturers attended the meeting. Two scale companies, Marel from Iceland and Scanvaegt from Denmark, currently manufacture marine scales which include components to compensate for effect of vessel motion on the recorded weights. Phillips Morris Scale Company proposed a scale system which would also use this technology. The meeting participants agreed that, in order for a marine scale to weigh accurately, it must make use of the "motion compensation" technology.

Scale systems capable of accurately weighing a large volume of groundfish as it moves through the sorting and processing lines will probably cost between \$30,000 and \$50,000. This price estimate does not include the cost of installation of the scale system which, depending on the amount of reconfiguration necessary, may cost from several thousand dollars to tens of thousands of dollars.

### **Accuracy standards for marine scale systems**

NMFS initially proposed that the appropriate accuracy standard for marine scales was between 0.50 percent and 5.0 percent. The range reflects NMFS's belief that the accuracy standard for marine scales would be somewhat lower than what could be achieved by similar systems on land. Scale manufacturers indicated that an accuracy standard of 3 percent was reasonable. In other words, they believe that marine scales could be expected to weigh fish, or a suitable test material, to within three percent of its true weight. Some marine scale manufacturers claim they can achieve a higher level of accuracy, but NMFS believes that a 3 percent accuracy standard balances the needs of fishery management with the recommendations of the scale manufacturers and the cost of setting too high a standard. If the accuracy requirement is too high, scale systems may fail to pass performance tests when they are, in fact, providing data of acceptable accuracy for fisheries management purposes.

### **There are no established performance standards for marine scales**

As mentioned previously, Handbook 44 does not include performance standards for marine scales because there are no scales of this type in use for commercial purposes. There are also no established standards for the design and testing of the motion

compensation components. Consequently, performance standards for scale systems used to weigh groundfish at sea will have to be developed by NMFS in cooperation with weights and measures agency and industry representatives.

#### **Minimizing the opportunity for fraud**

In addition to requiring a high level of accuracy from the scale systems, NMFS would also like to require scales that are designed to limit the opportunity for people to tamper with the weighing, recording, or reporting mechanisms. Commercial scale regulations contain requirements specifically designed to minimize the potential for fraud and many of these requirements can be adopted for marine scales. However, there are limits to ability of NMFS to mandate tamper-proof scale systems, particularly in the design of computer software used to record and report scale readings. The success of processor vessel quota monitoring on the basis of scale weights will depend a great deal on the level of observer monitoring and the continued collection of processed product weight information.

#### **Sorting groundfish by species or species group and weighing before discard or processing**

The recommendation that processor vessels provide NMFS a scale weight of groundfish catch by species or species group was discussed at length. Vessel operators present at the meeting expressed concern that the space limitations on the processor vessels made it impossible to provide the sorting and holding area that would be necessary meet this requirement. They stated that extensive remodeling would be necessary and, in many cases, not only would processing equipment have to be moved, but some equipment may have to be removed from the factory. NMFS agrees that space is very limited on many processor vessels. However, at this time, NMFS believes that the standards for establishing catch for an individual vessel will require scale weights of each species or species group for which the vessel has an individual quota.

#### **Back-up measurement systems for the open access fishery in case the scale system fails to operate**

Many of the meeting participants felt that NMFS's initial recommendation to require a vessel to cease fishing if their scale system failed to operate was too severe, especially if it were applied to scale systems used in the open access fishery. They believed that this requirement punished the processor vessels with 100 percent observer coverage and scales while processor and fishing vessels with less observer coverage and no scales would be allowed to continue fishing using less accurate methods for estimating total harvest. At this time, NMFS believes that accurate scale weights for each species or species

group will be necessary to monitor individual vessel quotas. In this case, if the scale system is not working, vessel operators would not be able to meet reporting requirements. If the Council recommends scale systems for management of the open access fishery, NMFS would consider options to allow for a back-up system to be used for a limited period of time if a scale system breaks down.

## PROPOSED ALTERNATIVES FOR ANALYSIS

### Alternative 1: Status quo

The total weight of groundfish harvested by, or delivered to, processor vessels would continue to be estimated based on a blend of observers estimates of total catch and processors estimates of product weight and standard product recovery rates. The total weight of catch processed by shoreside plants would continue to be based on the estimated weight of groundfish delivered by catcher vessels and observer estimates of discards at sea.

**ISSUE:** Status quo will not provide a catch monitoring system that will be adequate to manage IFQs as proposed under the Council's Comprehensive Rationalization Plan.

### Alternative 2: NMFS's recommendation for groundfish catch measurement to monitor IFQs under the Council's Comprehensive Rationalization Plan:

All groundfish harvested under an IFQ would be weighed by species or species group prior to discard or processing for the purposes of quota monitoring.

All processor vessels would be required to have 100 percent observer coverage.

Some catcher/processor trawl and hook-and-line vessels are less than 125 feet length overall so are not currently required to have 100 percent observer coverage. At this time, NMFS is recommending that scale systems would be an effective tool for monitoring groundfish catch only on vessels that have 100 percent observer coverage. Installation of scale systems on vessels with less than 100 percent observer coverage would not be an effective measure to improve total catch measurement because of the limited opportunity to monitor the scale system's performance.

#### Trawl gear

All groundfish harvested under an IFQ by trawl catcher/processor vessels with 100 percent observer coverage or delivered by trawl catcher vessels to processor vessels with 100 percent observer coverage would be required to be weighed by species or species group prior to discard or processing.

## **Alternative 2 (continued)**

### **Hook-and-Line gear**

All groundfish harvested under an IFQ by hook-and-line catcher/processor vessels with 100 percent observer coverage would be required to be brought on board the vessel and weighed prior to discard or processing.

### **Pot gear**

All groundfish harvested under an IFQ by pot catcher/processor vessels with 100 percent observer coverage would be required to be weighed prior to discard or processing.

### **Catcher vessels**

All groundfish harvested under an IFQ by catcher vessels would be required to be weighed prior to discard or processing.

Catcher vessels with observers on board may provide a scale system to weigh their catch prior to discarding at sea or they may retain all groundfish for which they have an IFQ and have it weighed by species group on a processor vessel or at a shoreside processing plant.

Catcher vessels with no observer on board would be required to retain all groundfish harvested under an IFQ and have it weighed by species or species group on a processor vessel or at a shoreside processing plant.

## Proposed schedule for analysis and implementation

January, 1994    Status report to NPFMC  
Identify alternatives to be analyzed

April, 1994     Draft analysis presented to NPFMC  
If approved, send analysis out for public review

June, 1994      Final action by NPFMC

January, 1995    Final regulations published  
One year implementation period allowed

January, 1996    Scale system to provide weight by species or  
species group must be installed and operational at  
least one year before implementation of CRP.