

MEMORANDUM

TO: Council, SSC and AP Members
FROM: Chris Oliver *Chris*
Executive Director
DATE: June 1, 2006
SUBJECT: Observer Program

ESTIMATED TIME
4 HOURS

ACTION REQUIRED

- a) Final action on analysis to modify the North Pacific Groundfish Observer Program (BSAI Amendment 86/GOA Amendment 76)
- b) Review discussion paper on video monitoring

BACKGROUND

- a) Final action on analysis to modify the North Pacific Groundfish Observer Program (BSAI Amendment 86/GOA Amendment 76)

The Council and its Observer Advisory Committee (OAC) have been working for several years to develop a new system for observer funding and deployment in the North Pacific Groundfish Observer Program (Observer Program). Under the proposed system, NMFS would contract directly with observer providers for observer coverage, and this would be supported by a broad-based user fee and/or direct Federal funding. Concerns with the existing program arise from the inability of NMFS to determine when and where observers should be deployed, inflexible coverage levels established in regulation, disproportionate cost issues among the various fishing fleets, and the difficulty to respond to evolving data and management needs in individual fisheries.

The proposed amendments (**BSAI Amendment 86/GOA Amendment 76**) are thus intended to address a variety of longstanding issues associated with the existing system of observer procurement and deployment, and the original problem statement was developed to this effect. The existing Observer Program, in place since 1990, establishes coverage levels for most vessels and processors based on vessel length and amount of groundfish processed, respectively. In designing the original program, the Council had limited options because the MSA did not provide authority to charge industry fees to pay for the cost of observers, and no Federal funds were provided. Because of the critical need for observers and the data they provide, the Council and NMFS proceeded with the Observer Program regulations (Amendments 13/18) that are largely unchanged today. These regulations were considered 'interim' at the time of implementation, as NMFS and the Council began to develop a new program (Research Plan) which would require all participants in the fisheries to pay a fee based on ex-vessel revenue from their catch, with NMFS contracting directly with the observer providers. Collection of the fee under the Research Plan was authorized by an amendment to the MSA (Section 313(b)(2)). The Council adopted this plan in 1992 and NMFS implemented the program in 1994. However,

due to several concerns primarily related to observer costs to industry, the Council voted to repeal the program in 1995. The 1990 interim regulations continue to authorize the existing Observer Program today. These regulations have been extended several times, with the most recent amendment extending the program until **December 31, 2007.**

In February 2006, the Council reviewed the initial draft of the analysis of the five primary alternatives. As part of this review, NMFS presented a letter (**Item C-5(a)(1)**) regarding observer compensation issues and the status of observers with regard to the requirements for overtime pay under the Fair Labor Standards Act (FLSA) and the Service Contract Act (SCA). This issue was brought to the forefront in a memo from Dr. Bill Hogarth in November 2003, which stated that NMFS maintains that fisheries observers are biological technicians and therefore eligible for overtime compensation under the FLSA. NMFS recently reaffirmed its position that observers employed by companies which contract directly with the agency or use Federal funds for provision of observer services must apply FLSA and SCA criteria to determine observer compensation requirements.¹

The NMFS letter reviewed in February outlines the ongoing concerns with not being able to provide a definitive assessment of observer costs under a new service delivery model at this time. Costs may not be possible to assess until actual contracts between NMFS and observer providers are finalized. In addition, NMFS has not yet received a response from the Department of Labor on its request for clarification of the applicability of several FLSA provisions. The NMFS letter also outlines the type of increased costs expected under any alternative other than status quo, as well as the need to ensure that funds are available to cover costs associated with oversight and management of a flexible, effective observer program. The existing observer program expires on December 31, 2007. **NMFS recommends that during the time period in which uncertainties remain unresolved, the Council should select Alternative 2 (*indefinite extension of the existing observer program*) as the preferred alternative under the current analysis.**

It is also important to note that NOAA General Counsel, Alaska Region (GCAK) has made a preliminary determination that the Research Plan authority provided in the MSA (Section 313) to assess a fee for observer coverage cannot be applied to only a subset of the vessels in the fisheries for which the Council and NMFS have the authority to establish a fee program. Therefore, all of the action alternatives except Alternative 2 (extension of the current program) are likely to require new statutory authorization unless it is determined that different fees can be assessed against different fisheries or sectors. This issue is discussed in more detail in the analysis.

The OAC met in late January to provide recommendations on the analysis and review the NMFS letter described above. The committee ultimately recommended that the Council select Alternative 2 as its preferred alternative for this analysis, given the need for continuing the program in the short-term and the lack of control over Congressional authority and cost issues. **The Council reviewed both NMFS's recommendation and the January OAC report in February 2006.**

Upon review, the Council identified Alternative 2 as its preliminary preferred alternative and approved an addition to the problem statement to recognize that while Alternative 2 does not meet the majority of the issues identified in the problem statement, it meets the short-term and primary need of preventing the expiration of the observer program until these external issues are resolved. The comprehensive problem statement for Amendments 86/76 is below (the second paragraph was added in February 2006):

¹Memo from Dr. William Hogarth to industry groups, November 29, 2005. At the same time, Dr. Hogarth also sent a letter to the DOL requesting an interpretation of the applicability of the SCA and FLSA to fisheries observers employed by observer service providers that are either under contract with or permitted by NMFS. This letter requests guidance in computing hours worked, geographical applicability, and the associated rules governing compensation of fisheries observers. Both letters are included in Appendix II of the analysis for Amendments 86/76.

BSAI Amendment 86/GOA Amendment 76 Problem Statement

The North Pacific Groundfish Observer Program (Observer Program) is widely recognized as a successful and essential program for management of the North Pacific groundfish fisheries. However, the Observer Program faces a number of longstanding problems that result primarily from its current structure. The existing program design is driven by coverage levels based on vessel size that, for the most part, have been established in regulation since 1990. The quality and utility of observer data suffer because coverage levels and deployment patterns cannot be effectively tailored to respond to current and future management needs and circumstances of individual fisheries. In addition, the existing program does not allow fishery managers to control when and where observers are deployed. This results in potential sources of bias that could jeopardize the statistical reliability of catch and bycatch data. The current program is also one in which many smaller vessels face observer costs that are disproportionately high relative to their gross earnings. Furthermore, the complicated and rigid coverage rules have led to observer availability and coverage compliance problems. The current funding mechanism and program structure do not provide the flexibility to solve many of these problems, nor do they allow the program to effectively respond to evolving and dynamic fisheries management objectives.

While the Council continues to recognize the issues in the problem statement above, existing obstacles prevent a comprehensive analysis of potential costs. Immediate Council action on a restructured program is not possible until information is forthcoming that includes clarification of cost issues that arise from Fair Labor Standards Act and Service Contract Act requirements and statutory authority for a comprehensive cost recovery program. During the interim period, the Council must take action to prevent the expiration of the existing program on December 31, 2007.

At the same time, the Council recommended that a new amendment proposing restructuring alternatives for the Observer Program should be considered by the Council at such time that: (1) legislative authority is established for fee-based alternatives; (2) the FLSA issues are clarified (by statute, regulation, or guidance) such that it is possible to estimate costs associated with the fee-based alternatives; and/or (3) the Council requests reconsideration in response to changes in conditions that cannot be anticipated at this time. Thus, should the Council choose Alternative 2 as its final preferred alternative at final action, the analysis of the restructuring alternatives to-date is intended as a starting point for a future amendment.

Final action on Amendments 86/76 is scheduled for this June 2006 Council meeting. The analysis was sent to you on May 16, and the executive summary is attached as **Item C-5(a)(2)**. The alternatives under consideration were developed through several Council and OAC meetings and are summarized below:

Alternative 1. No action alternative. Under this alternative, the current “pay-as-you-go” program would continue to be the only system under which groundfish observers would be provided in the groundfish fisheries of the BSAI and GOA. Regulations authorizing the current program expire at the end of 2007, meaning that no action is not a viable alternative over the long-term.

Alternative 2. Rollover alternative: Extension of the existing program. (Preliminary preferred alternative). Under this alternative, the 2007 sunset date for the existing program would be removed and the program would be extended indefinitely with no changes to the overall service delivery model until the Council took further action. Because unresolved issues related to labor costs prevent a comprehensive analysis of potential costs, and the Council currently lacks the statutory authority to implement the funding mechanisms proposed in

Alternatives 3 through 5, immediate Council action on a restructured program is not possible. This alternative would prevent the existing program from expiring until such time that comprehensive restructuring may be possible.

Alternative 3. GOA-based restructuring alternative. Restructured program for GOA groundfish and all halibut fisheries; rollover existing program in BSAI. A new ex-vessel value fee program would be established to fund coverage for GOA groundfish vessels, GOA-based processors, and halibut vessels operating throughout Alaska. Regulations that divide the fleet into 0%, 30%, and 100% coverage categories would no longer apply to vessels and processors in the GOA. Fishermen and processors would no longer be responsible for obtaining their own observer coverage. NMFS would determine when and where to deploy observers based on data collection and monitoring needs, and would contract directly for observers using fee proceeds and/or direct Federal funding. Vessels in the GOA would be required to carry an observer when one is provided by NMFS. Under this alternative, the current "pay-as-you-go" system would be unchanged for all groundfish vessels and processors that operate in the BSAI. Vessels and processors that operate in both management areas would obtain their observer coverage and pay fees through whichever program applies to the management area in which they are currently operating.

Alternative 4. Coverage-based restructuring alternative. Restructured program for all fisheries with coverage less than 100% (Tiers 3 and 4). This alternative differs from Alternative 3 in that the program would be defined by coverage categories rather than geographic area. All vessels and processors assigned to Tiers 3 and 4 (i.e. that require less than 100% coverage) would participate in the new program throughout Alaska and pay an ex-vessel value based fee. In general, this alternative would apply to all halibut vessels, all groundfish catcher vessels <125' LOA and all non-AFA shoreside processors. All vessels and processors assigned to Tiers 1 and 2 (100% or greater coverage) would continue to operate under the current "pay-as-you-go" system throughout Alaska.

Alternative 5. Comprehensive restructuring alternative. Restructured program for all groundfish and halibut fisheries off Alaska. This alternative would establish a new fee-based groundfish observer program in which NMFS has a direct contract with observer providers for all GOA and BSAI groundfish and halibut vessels. Under this alternative, vessels with 100% or greater coverage requirements would pay a daily observer fee and vessels with coverage requirements less than 100% would pay an ex-vessel value based fee.

b) Review discussion paper on video monitoring

In February 2006, the Council also requested that NMFS prepare a discussion paper on issues and internal agency process for the use of video equipment to complement and augment observer monitoring of the North Pacific groundfish fisheries under the current observer service delivery model. This paper is attached as **Item C-5(b)**.

Note that a report on a pilot project conducted in the summer of 2005 on electronic monitoring in the Gulf of Alaska rockfish fishery was sent as an informational item on May 22. In addition, a 2004 report on fisheries monitoring technologies is provided as Appendix I to the analysis for Amendments 86/76 discussed above. This report was developed by MRAG Americas, Inc., under contract with the Council, to investigate catch and vessel monitoring technologies that may augment observer programs, with emphasis on applicability in the Gulf of Alaska and BSAI fisheries.



Item C-5(a)(1)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668
January 22, 2006

Ms. Stephanie Madsen, Chair
North Pacific Fishery Management Council
605 West 4th Ave., Suite 306
Anchorage, AK 99501-2252

Dear Madam Chair:

During the last several months, staff from the Alaska Regional Office, the Alaska Fisheries Science Center and the North Pacific Fishery Management Council (Council) have prepared an analysis of the five alternatives for restructuring the North Pacific Groundfish Observer Program (NPGOP) that were identified by the Council at its June 2005 meeting. This analysis will be presented to the Observer Advisory Committee (OAC) at its January 2006 meeting and carried forward to the Council for initial review at its February 2006 meeting in Seattle.

At the June 2005 meeting, some Council members and members of the public expressed concern that changes in the observer service delivery model which would occur under certain alternatives might result in increases in industry costs associated with observer labor. The Fair Labor Standards Act (FLSA) governs pay rate and overtime provisions of observer compensation of both current and future service delivery models. NOAA Fisheries Service has recently reaffirmed its position that observers employed by companies which contract directly with the agency or use federal funds for provision of observer services must apply FLSA and Service Contract Act (SCA) criteria to determine observer compensation requirements. These criteria are specified in federal labor regulations and include exemptions to the requirement to pay overtime for hours worked in excess of 40 hours per week. The exemption criteria include, among others, whether observers are paid on a salary or hourly basis, examination of their specific duties, responsibilities and education, and whether a collective bargaining agreement is in force.

Even though this reaffirmation by NOAA Fisheries Service addresses some of the concerns that were raised at the June 2005 Council meeting, we still are unable to provide a definitive assessment of observer costs under a new service delivery model. The applicability of some FLSA provisions and the actual number of hours worked by observers each day may not be determined until contracts between NOAA and observer providers are finalized. Furthermore, the Department of Labor (DOL) has yet to respond to a November 2005 NOAA Fisheries Service request to clarify uncertainties regarding classification of working and non-working hours, and verification of hours worked in an unsupervised environment. Initial feedback from DOL indicates that we may not receive a reply for several months, and that they may be unable to provide definitive answers to some of the labor-cost related questions.

Changes in industry costs associated with observer wages under different service delivery models are not the only costs warranting evaluation. The preliminary analysis presented to the Council at the June 2005 meeting identified some of the increased costs that would be incurred by NOAA Fisheries Service under alternatives other than status quo. These include:



- Costs of increased staffing for contract development, implementation and management;
- Additional staff that would be necessary to support the AFSC's more "hands-on" role in directing and adjusting observer coverage;
- Increased costs for the development and implementation of technological monitoring approaches and vessel specific monitoring plans (VMPs) also are expected, although these costs will occur even under the status quo alternative; and
- Increases in observer coverage that may be necessary to meet new fishery management program monitoring requirements and which would increase the AFSC's costs for observer training, briefing, debriefing and database management (and a range of other functions).

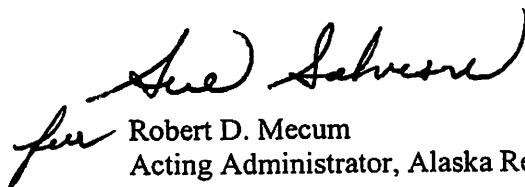
The magnitude of these increased costs depends on the design of the new monitoring system, the complexity and number of VMPs that are put in place and the overall increase in observer deployment days. However, at a minimum, salaries for new FTEs and operational costs would be required.

While agency and industry cost issues should be determined and resolved to the extent possible before restructuring can proceed, they are but one aspect of an effective restructuring program. To be most effective, restructuring alternatives must provide flexibility to adjust coverage levels in all sectors to optimize coverage relative to information needs, and encourage technological innovation when appropriate and cost effective. This requires us to take a more comprehensive approach to restructuring and to ensure that funds are available to cover costs associated with oversight and management of the observer program, as well as direct observer deployment costs.

At the January 2006 OAC meeting, we will discuss these issues with committee members and work towards developing new fisheries monitoring approaches for consideration by the Council. These approaches must recognize the need to constrain industry costs, provide funds necessary for NOAA Fisheries Service to operate the NPGOP, provide flexibility to optimize the benefits of observer coverage when resources are limited, and encourage appropriate use of video and other technologies for fishery monitoring.

We are hopeful that, through our collective efforts, we can build on the analytical work already completed and move forward to design and implement a comprehensive, flexible, and cost effective observation and monitoring system which will meet the needs for fishery-dependent information in the North Pacific groundfish fisheries for the foreseeable future. However, during the time period that the uncertainties outlined above remain unresolved, we recommend that the current structure of NPGOP be maintained and that the OAC and the Council consider Alternative 2 as the approach best suited to address current needs.

Sincerely,


 Robert D. Mecum
 Acting Administrator, Alaska Region

Executive Summary

This draft Environmental Assessment/Regulatory Impact Review (EA/RIR) examines the environmental and economic effects of BSAI Amendment 86 and GOA Amendment 76 to restructure the North Pacific Groundfish Observer Program (Observer Program). The proposed action is intended to address a variety of longstanding issues associated with the existing system of observer procurement and deployment. At its February 2003 meeting, the Council approved the following problem statement for restructuring the Observer Program:

BSAI Amendment 86/GOA Amendment 76 Problem Statement

The North Pacific Groundfish Observer Program (Observer Program) is widely recognized as a successful and essential program for management of the North Pacific groundfish fisheries. However, the Observer Program faces a number of longstanding problems that result primarily from its current structure. The existing program design is driven by coverage levels based on vessel size that, for the most part, have been established in regulation since 1990. The quality and utility of observer data suffer because coverage levels and deployment patterns cannot be effectively tailored to respond to current and future management needs and circumstances of individual fisheries. In addition, the existing program does not allow fishery managers to control when and where observers are deployed. This results in potential sources of bias that could jeopardize the statistical reliability of catch and bycatch data. The current program is also one in which many smaller vessels face observer costs that are disproportionately high relative to their gross earnings. Furthermore, the complicated and rigid coverage rules have led to observer availability and coverage compliance problems. The current funding mechanism and program structure do not provide the flexibility to solve many of these problems, nor do they allow the program to effectively respond to evolving and dynamic fisheries management objectives.

At its February 2006 meeting, the Council identified Alternative 2 (extension of the existing program) as the preliminary preferred alternative. The Council also approved an addition to the problem statement as follows:

While the Council continues to recognize the issues in the problem statement above, existing obstacles prevent a comprehensive analysis of potential costs. Immediate Council action on a restructured program is not possible until information is forthcoming that includes clarification of cost issues that arise from Fair Labor Standards Act and Service Contract Act requirements and statutory authority for a comprehensive cost recovery program. During the interim period, the Council must take action to prevent the expiration of the existing program on December 31, 2007.

Also at its February 2006 meeting, the Council recommended that a new amendment proposing restructuring alternatives for the Observer Program should be considered by the Council at such time that: (1) legislative authority is established for fee-based alternatives; (2) Fair Labor Standards Act (FLSA) issues are clarified (by statute, regulation, or guidance) such that it is possible to estimate costs associated with the fee-based alternatives; and/or (3) the Council requests reconsideration in response to changes in conditions that cannot be anticipated at this time. The Council also recommended that subsequent amendment packages regarding the Observer Program should include an option for the Federal funding of observers.

The Council also requested that NMFS prepare a discussion paper on issues and internal agency process for the use of video equipment to complement and augment observer monitoring of the North Pacific groundfish fisheries under the current service delivery model.

In identifying Alternative 2 as its preliminary preferred alternative, the Council was responding to a letter from NMFS Alaska Region dated January 22, 2006, in which NMFS recommended extending the existing program under Alternative 2 until a number of critical cost-related issues could be resolved.¹ In its letter, NMFS recommended that the Council adopt Alternative 2 to maintain the current program until cost issues are able to be analyzed and statutory barriers to fee collection are resolved.

Development of the current suite of alternatives

Because previous attempts to restructure the program had not been successful, NMFS, Council staff, and the Observer Advisory Committee (OAC) originally considered a stepwise approach in this amendment package. This was based on the concept that it might be effective to undertake a less ambitious restructuring effort focused primarily on those regions and fisheries where the problems of disproportionate costs and coverage are most acute. The intent was that once a restructured program had been implemented successfully for some fisheries, the Council could decide whether or not to proceed with expanding the program to include additional fisheries. The initial alternatives approved by the Council in April 2003 reflected this approach, and focused primarily on the groundfish and halibut fisheries of the GOA, with options to include BSAI groundfish vessels that currently have less than 100% coverage requirements. In December 2003, the Council reviewed a preliminary draft analysis of the impact of those alternatives that were focused primarily on the GOA.

As NMFS began to evaluate alternatives under this scenario, however, concerns arose that certain operational and data quality issues would be difficult to resolve under a “hybrid” system (with some fisheries covered by a new program and others continuing to operate under the old system) and that, in fact, some of these problems would likely become exacerbated under such a system. NMFS identified a range of operational and data quality issues associated with the current model. These included the agency’s inability to: determine where and when observer coverage takes place on less-than-100% observed sectors of the fleet; match observer skill level with deployment complexity; reduce observer coverage for sectors of the fleet that are now subject to 100% or greater coverage levels; and implement technological innovations which might meet monitoring needs while reducing observer coverage costs and expenses.

At the February 2004 Council meeting, NMFS described the above concerns and informed the Council that the agency had determined that effective procedures for addressing observer performance and data quality issues could only be addressed through a service delivery model that provided direct contractual arrangements between NMFS and the observer providers. NMFS thus recommended that the Council include an additional alternative to the draft analysis that would apply the proposed direct contract model program-wide, so that all observer services in the Federal fisheries of both the BSAI and the GOA would be provided by observer companies through direct contracts with NMFS.

At its June 2004 meeting, the Council approved seven alternatives distinguished primarily by scope that ranged from a new program for GOA groundfish fisheries only to a comprehensive program for all groundfish and halibut fisheries off Alaska. At its June 2005 meeting, the Council decided to consolidate its suite of alternatives in order to eliminate redundancy between alternatives and better focus the analysis

¹Letter from Robert D. Mecum, Acting Administrator, Alaska Region to Stephanie Madsen, Chair, North Pacific Fishery Management Council, January 22, 2006. See Appendix II.

on the major policy issues facing the Council and NMFS in developing a new groundfish observer program for the North Pacific. The Council thus approved the current suite of five alternatives in June 2005.

Summary of the Alternatives

The Council identified Alternative 2 as its preliminary preferred alternative in February 2006, for various reasons related to Congressional authority and cost uncertainties (see Chapter 1). However, the analysis continues to evaluate all five primary alternatives, including the three restructuring alternatives that are less viable alternatives at this time.

The Council intends to initiate a new amendment with restructuring alternatives at such time that: (1) legislative authority is established for fee-based alternatives; (2) the FLSA issues are clarified (by statute, regulation, or guidance) such that it is possible to estimate costs associated with the fee-based alternatives; and/or (3) the Council requests reconsideration in response to changes in conditions that cannot be anticipated at this time. Thus, should the Council choose Alternative 2 as its final preferred alternative at final action, it is intended that the analysis of the restructuring alternatives would be used as a starting point in a future amendment, to be initiated at such time as described above.

Alternative 1. No action alternative. Under this alternative, the current interim “pay-as-you-go” program would continue to be the only system under which groundfish observers would be provided in the groundfish fisheries of the BSAI and GOA. Regulations authorizing the current program expire at the end of 2007, meaning that no action is not a viable alternative over the long-term.

Alternative 2. Rollover alternative: Extension of the existing program. (Preliminary preferred alternative). Under this alternative, the 2007 sunset date for the existing program would be removed and the program would be extended indefinitely with no changes to the overall service delivery model until the Council took further action. Because unresolved issues related to labor costs prevent a comprehensive analysis of potential costs, and the Council currently lacks the statutory authority to implement the funding mechanisms proposed in Alternatives 3 through 5, immediate Council action on a restructured program is not possible. This alternative would prevent the existing program from expiring until such time that comprehensive restructuring may be possible.

Alternative 3. GOA-based restructuring alternative. Restructured program for GOA groundfish and all halibut fisheries; rollover existing program in BSAI. A new ex-vessel value fee program would be established to fund coverage for GOA groundfish vessels, GOA-based processors, and halibut vessels operating throughout Alaska. Regulations that divide the fleet into 0%, 30%, and 100% coverage categories would no longer apply to vessels and processors in the GOA. Fishermen and processors would no longer be responsible for obtaining their own observer coverage. NMFS would determine when and where to deploy observers based on data collection and monitoring needs, and would contract directly for observers using fee proceeds and/or direct Federal funding. Vessels in the GOA would be required to carry an observer when one is provided by NMFS. Under this alternative, the current “pay-as-you-go” system would be unchanged for all groundfish vessels and processors that operate in the BSAI. Vessels and processors that operate in both management areas would obtain their observer coverage and pay fees through whichever program applies to the management area in which they are currently operating.

Alternative 4. Coverage-based restructuring alternative. Restructured program for all fisheries with coverage less than 100% (Tiers 3 and 4). This alternative differs from Alternative 3 in that the program would be defined by coverage categories rather than geographic area. All vessels and processors assigned to Tiers 3 and 4 (i.e. that require less than 100% coverage) would participate in the new program throughout Alaska and pay an ex-vessel value based fee. In general, this alternative would apply to all halibut vessels, all groundfish catcher vessels <125' LOA and all non-AFA shoreside processors. All vessels and processors assigned to Tiers 1 and 2 (100% or greater coverage) would continue to operate under the current "pay-as-you-go" system throughout Alaska.

Alternative 5. Comprehensive restructuring alternative. Restructured program for all groundfish and halibut fisheries off Alaska. This alternative would establish a new fee-based groundfish observer program in which NMFS has a direct contract with observer providers for all GOA and BSAI groundfish and halibut vessels. Under this alternative, vessels with 100% or greater coverage requirements would pay a daily observer fee and vessels with coverage requirements less than 100% would pay an ex-vessel value based fee.

Table ES-1 provides a summary of the vessels and processors included under each restructuring alternative.

Table ES-1 Vessels and processors included under Alternatives 3 - 5

<i>Area</i>	<i>Vessel/Processor class</i>	<i>Alt. 3 (GOA-based)</i>	<i>Alt. 4 (Tiers 3 and 4 only)</i>	<i>Alt. 5 (Comprehensive Alt.)</i>
GOA	Halibut vessels	Yes	Yes	Yes
	Groundfish CVs (all gears and sizes classes)	Yes	Yes	Yes
	Non-AFA inshore processors	Yes	Yes	Yes
	Pot CPs	Yes	Yes	Yes
	*Trawl CPs < 125'	Yes		Yes
	*Hook-and-line CPs <125'	Yes		Yes
	Trawl CPs ≥ 125'	Yes		Yes
	Hook-and-line CPs ≥ 125'	Yes		
BSAI	Halibut vessels	Yes	Yes	Yes
	Non-AFA CVs (all gears and size classes)		Yes	Yes
	Pot CPs		Yes	Yes
	AFA CVs <125'		Yes	Yes
	non-AFA inshore processors		Yes	Yes
	AFA CVs ≥ 125'			Yes
	*Non-AFA trawl & hook-and-line CPs <125'			Yes
	Non-AFA trawl & hook-and-line CPs ≥125'			Yes
	AFA inshore processors			Yes
	AFA motherships			Yes
	AFA CPs			Yes
	CDQ vessels and processors		Tier 3 and 4 vessels and processors are also included when fishing CDQ.	Yes

*Note that NMFS currently recommends placing hook-and-line and trawl CPs <125' (with the exception of AFA and CDQ CPs) in Tier 2 (100% coverage). These fleets could also be placed in Tier 3 and NMFS could choose to distribute 100% coverage on these vessels under an ex-vessel value fee.

Elements necessary under restructuring Alternatives 3 - 5

Several elements are necessary under a restructured program proposed under Alternatives 3 – 5. Much of the analysis describes and evaluates the elements necessary to include under the alternatives considered for a restructured program, as those alternatives were the primary focus prior to the recognition that Alternative 2 is the only viable action alternative in the short-term. The following sections summarize the primary decision points related to Alternatives 3 – 5.

Coverage requirements: How would coverage levels be determined?

The issue of coverage levels arises with the implementation of a program that rescinds the current coverage levels based on vessel length and processing volume and replaces them with one in which NMFS has more flexibility to decide when and where to deploy observers. This is because some type of

organizational structure is still necessary to categorize vessels and processors for the purpose of determining coverage levels. The establishment of uniform criteria for determining coverage requirements will also assist the Council in determining what levels of coverage are necessary when new management programs are proposed. As a replacement for the existing vessel length based categories, the following four tier system of coverage is proposed. Vessels and processors would be placed into one of the four coverage tiers based on their fishery and operating mode. The purpose of designing this four tier coverage system is to establish clear and uniform criteria for determining what level of coverage is required in each fishery. **The determination of which fishery sectors are placed into which tier is a decision point at final action under any of the restructuring alternatives (Alternatives 3 – 5).**

The following is a description of the four proposed coverage tiers:

- **Tier 1 fisheries (200% coverage).** These are fisheries in which two observers must be present so that observers are available to sample every haul on processors or delivery on vessels. Tier 1 fisheries are generally those in which observers are directly involved in the accounting of individual vessel catch or bycatch quotas.
- **Tier 2 fisheries (100% coverage).** These are fisheries in which one observer is deployed on each vessel and processor. In contrast to Tier 1, it is recognized that the observer will likely be unable to sample all hauls or deliveries due to workload constraints and will, therefore, follow random sampling procedures so that the vessel or processor will not know in advance which hauls or deliveries will be sampled. Under certain circumstances, vessels that would otherwise qualify for Tier 1 coverage could operate with a single observer in Tier 2 if they are operating under restricted hours or an alternative monitoring plan approved by NMFS in which alternate technologies are used to monitor scales when the observer is absent.
- **Tier 3 fisheries (regular coverage generally less than 100%).** *(This tier replaces the old 30% coverage requirement).* These are fisheries in which NMFS is dependent on observer coverage for inseason management but in which 100% coverage on every vessel is unnecessary because observer data is aggregated across a larger fleet. Vessels participating in Tier 3 fisheries can expect to receive coverage on a regular basis and will be required to carry observers when requested to do so by NMFS. However, the actual coverage that each vessel receives will depend on the coverage priorities established by NMFS and the sampling plan developed for the individual fishery in which the vessel is participating. The actual coverage a particular vessel or processor receives could range from zero to 100%, but on a fleet-wide basis, coverage levels are more likely to average closer to 30%.
- **Tier 4 fisheries (previously unobserved).** These are fisheries in which NMFS is not currently dependent on observer data for inseason management. At the outset of the program, coverage levels in Tier 4 fisheries are expected to be low, and used for special data needs and research rather than inseason management. Halibut vessels, jig vessels, and groundfish vessels <60' would be assigned to Tier 4. In the initial years of a restructured program, NMFS could deploy observers on these vessels when necessary to collect needed baseline data or to respond to specific data needs, but would not deploy observers on a regular basis to collect inseason management data. Vessels in Tier 4 would be required to carry observers when requested to do so by NMFS but such requests are unlikely to occur on a regular basis during the outset of the program. As NMFS and industry gain experience with the deployment of observers in small-vessel fisheries, the dividing line between Tiers 3 and 4 may become less meaningful.

Under the four tier structure, coverage levels would remain unchanged from the status quo for most vessels and processors that currently have 100% or 200% coverage requirements. The biggest change would occur for vessels that currently have 30% coverage requirements or no coverage requirements. Under the four tier structure, most current 30% vessels would fall into Tier 3 and can expect regular coverage at a level less than 100%. Most vessels that currently have no coverage requirements would fall into Tier 4 and be required to carry an observer when requested, but can expect such coverage to be a relatively rare occurrence, especially during the initial years of the program.

This analysis does not propose an annual mechanism through which a fishery would change from one tier to another if it is determined that coverage levels need to be increased or decreased. Currently, all coverage levels are established in regulation and any changes to existing coverage requirements must be implemented through notice and comment rulemaking. **Based on NOAA GC guidance, this analysis assumes that formal rulemaking would also be necessary to change fisheries from one tier to another under the new system.** Agency flexibility would still be substantially increased through the proposed system, however, as the coverage levels for fisheries within Tiers 3 and 4 could be shifted and modified on an inseason basis. Table ES-2 provides a summary of the proposed tier classifications for each class of vessel and processor under Alternatives 3 - 5.

Table ES-2 Proposed tier levels for vessels and processors under Alternatives 3 – 5

<i>Vessel/processor/fishery</i>	<i>Current coverage requirements</i>	<i>Proposed tier classification</i>
AFA CPs	200% coverage	Tier 1
CDQ CPs	200% coverage	Tier 1
AFA motherships	200% coverage	Tier 1
AFA inshore processors	1 observer for each 12 hour period (i.e. 2 observers if plant operates more than 12 hours/day)	Tier 1
Non-AFA trawl CP vessels $\geq 125'$ in the BSAI	100% coverage ¹	Tier 2
CPs fishing for Atka mackerel in the Aleutian Islands Subarea	200% coverage	Tier 1
Non-AFA trawl CP vessels $< 125'$ in the BSAI	30% coverage ²	Tier 2
Non-AFA trawl CP vessels $\geq 125'$ in the GOA	100% coverage	Tier 2
CVs $> 60'$ and pot CPs fishing CDQ	100% coverage	Tier 2
Non-AFA Trawl H&G vessels $< 125'$ in the GOA	30% coverage	Tier 2
Non-AFA inshore processors	0%, 30%, or 100% based on processing volume	Tier 3
Trawl CVs $\geq 125'$ (Including CDQ and AFA)	100% coverage	Tier 2 ³
Trawl CVs 60'-125' (Including CDQ and AFA)	30% coverage	Tier 3
Hook-and-line CPs $\geq 125'$	100% coverage	Tier 2
Hook-and-line CPs 60'-125'	30% coverage	Tier 2
Hook-and-line CVs 60'-125'	30% coverage	Tier 3
Hook-and-line CVs $\geq 125'$	100% coverage	Tier 3
Pot vessels $\geq 60'$	30% coverage	Tier 3
Halibut vessels	no coverage	Tier 4
Jig vessels (all sizes)	no coverage or 30% depending on vessel length	Tier 4
Groundfish vessels $< 60'$	no coverage	Tier 4

¹The final rule for BSAI Am. 79 was published on April 6, 2006 (71 FR 17362). This rule requires at least two level 2 observers each day a non-AFA trawl CP $\geq 125'$ is harvesting or processing groundfish in the BSAI. NMFS may authorize the vessel to carry only one lead level 2 under an alternative processing plan. This rule will be effective January 20, 2008.

²Note: 200% coverage is proposed under BSAI Amendment 80. Final Council action is scheduled for June 2006.

³While trawl CVs $\geq 125'$ are currently proposed to be in Tier 2 (100% coverage requirement), NMFS notes that assignment to Tier 3 may be possible in the future combined with a video monitoring requirement.

Funding mechanism

All of the restructuring alternatives contained within this analysis anticipate funding the new observer program through some combination of user fees and direct Federal funding. Federal funding may be necessary to get the program started, fund some direct coverage costs if industry fees are inadequate, and fund agency costs associated with implementing and maintaining the program. Therefore, any decisions related to the type of user fee would not preclude the possibility of obtaining Federal funding to cover observer deployment costs. There are several decisions related to the funding mechanism under each restructuring alternative. Section 2.2.3 of the analysis outlines the primary issues and concepts relevant to the funding mechanism:

- Type of fee (ex-vessel value or daily observer fee)
- Uniform or variable fees
- Supplemental fee options for special programs
- Initial fee percentage
- Process for adjusting fee percentages
- Fee collection mechanism
- Start-up funding and Federal funds
- Restriction on the use of fee proceeds

Type of user fee

Two primary types of fee programs are proposed under the restructuring alternatives:

1. **Ex-vessel value fee:** An ex-vessel value fee is proposed for Alternatives 3 and 4, and to fund coverage in Tier 3 and 4 fisheries under Alternative 5. Fees based on the ex-vessel value of landed catch are the most common type of fee currently used in the North Pacific. Under the ex-vessel value fee program, the fee amount would be paid by both vessels and processors. Catcher processors that both harvest and process their catch would pay both the harvesting and processing portion of the fee, meaning that their fee amount would be double that charged to catcher vessels and processors. This is the same approach that was taken under the original research plan in the early 1990s.
2. **Daily coverage fee:** A daily observer fee is proposed to fund coverage for Tier 1 and 2 fisheries under Alternative 5. This approach would to some extent mirror the existing "pay-as-you-go" program, except that vessel owners would be billed by NMFS for their coverage instead of contracting directly with an observer provider. Such a fee could be designed to exactly match the direct costs of observer coverage, as is currently the case with the existing pay-as-you-go program, or the fee could be set at a lower level than actual coverage costs if Federal funds are available to support the program.

Setting the initial fee level

If Alternative 3, 4, or 5 is selected, one of the most important decision points for the Council is setting an initial fee percentage for those vessels/fisheries that will operate under an ex-vessel value based fee. The fee percentage (and the level of Federal funding) would determine the program's budget and would directly affect coverage levels in the fisheries covered by the program and costs paid by industry. The issue of how much coverage is necessary or optimal to manage particular groundfish and halibut fisheries is complex and goes beyond the scope of this analysis. The process proposed to determine coverage levels in fisheries with less than 100% coverage requirements (Tier 3 and 4) is described in Chapter 4.

Most of the fisheries in question are currently evolving, as a rationalization program is under development for the GOA groundfish fisheries and cooperative management proposals are under development for the catcher processor sector in the BSAI flatfish fisheries. Thus, future coverage needs are unknown. It is beyond the scope of this analysis to determine what levels of coverage would ultimately be necessary to implement the various rationalization and cooperative management proposals that are currently under development, as this amendment is intended to establish a new program structure overall for observer procurement and deployment in the future. For this reason, this analysis is limited to considering the fee percentages necessary to maintain existing levels of coverage overall (with the flexibility to shift coverage among the Tier 3 and 4 fisheries as necessary) and provide resources to expand the program into fisheries that currently have no coverage (the halibut and <60' groundfish fleets) in the absence of any direct Federal funding. To the extent that Federal funding becomes available, fee percentages could be reduced or coverage increased. **Therefore, three fee percentage levels (upper, middle, and lower endpoints) are proposed for Council consideration under each restructuring alternative in Chapter 4.**

Option 1 (lower endpoint fee): Maintain the existing number of deployment days. Under this option, the fee percentage would be set at the level necessary to provide an equivalent number of coverage days that are currently provided under the status quo. NMFS would have roughly the same number of observers to work with as are available under the status quo, but would have the flexibility to deploy these observers in a more rational fashion to maximize the utility of the data collected. Under this option, any deployment of observers in the halibut fishery and on groundfish vessels under 60' would come at the expense of existing coverage levels on shoreside processors and groundfish vessels $\geq 60'$. Under all of the action alternatives, the average costs of observer coverage for vessels that currently carry observers would go down under this endpoint because the status quo number of coverage days would be supported by revenues from a wider fleet than under the status quo.

Option 2 (mid-point fee): Establish a fee percentage that accommodates 100% coverage for trawl and hook-and-line CPs <125' while maintaining the existing number of observer days for the remaining fleets covered by the program. Under this option, all trawl and hook-and-line CPs <125' would be assessed an ex-vessel value fee, but with the objective of generating sufficient revenue to raise their coverage level to 100%. Therefore, fees are increased relative to Option 1 to accommodate the increase in coverage without affecting coverage levels in other fisheries. This option applies to Alternative 3, and would only apply to Alternatives 4 and 5 if the Council decides to include CPs <125' in Tier 3. If the Council decides to assign CPs <125' to Tier 2 (as recommended by NMFS) under Alternatives 4 or 5, then the mid-point fee percentage is not applicable. In this case, CPs <125' would operate under the existing program (Alt. 4) or pay a daily fishing fee (Alt. 5) rather than an ex-vessel value fee.

Option 3 (upper endpoint fee): Establish a fee percentage that is self-supporting at current coverage levels for sectors that currently have coverage and apply the same fee percentage to all new fisheries into which the program expands. Under this option, the fee percentage would be set at a level necessary for fee revenues from the currently covered sectors of the industry (groundfish vessels $\geq 60'$ and shoreside processors) to fund the current number of deployment days in those sectors. Each new sector that is not currently covered that comes into the program will generate additional fee revenues so that expansion of coverage into the <60' groundfish and halibut fleets would not necessarily come at the expense of existing coverage for vessels $\geq 60'$. Because the average daily revenues generated by halibut vessels and groundfish vessels <60' are lower than the average daily revenues generated by groundfish vessels $\geq 60'$, and because observer costs per deployment day are generally higher for small vessels that operate out of more remote ports, fee revenues generated by halibut vessels and groundfish vessels <60' would not be adequate to extend coverage to those vessels at levels currently in effect for groundfish vessels $\geq 60'$. A precise estimate of the level of coverage that the upper endpoint fee would provide for

halibut and groundfish vessels <60' is difficult to determine because data on the average number of fishing days for such vessels is unavailable.

Table ES-3 provides estimates of the low, mid, and high fee endpoints for each action alternative. **Note that the ex-vessel value based fees provided in the table are only applicable to those vessels that are required to pay an ex-vessel value based fee in each of the alternatives.** Thus, under Alternative 3, all GOA vessels and processors and halibut vessels in all areas would pay the fee. Groundfish vessels and processors in the BSAI would continue operating in the existing pay-as-you-go system. Under Alternative 4, only vessels in sectors included in Tiers 3 and 4 in both the GOA and the BSAI would pay the fee. Vessels selected for inclusion in Tiers 1 and 2 in both the GOA and the BSAI would continue under the existing pay-as-you-go system. Finally, under Alternative 5, only vessels in sectors in Tiers 3 and 4 in both the GOA and the BSAI would pay the fee shown in Table ES-3. Vessels selected for inclusion in Tiers 1 and 2 in both the GOA and the BSAI would pay a daily observer fee similar to the current pay-as-you-go system, the difference is that it would be paid directly to NMFS.

The estimates in Table ES-3 are based on current estimates of daily coverage costs. The fee percentages vary substantially among alternatives because as each group of vessels is included in the program, they bring with them both a revenue base, in terms of the ex-vessel value of their landings, and coverage needs. The coverage needs relative to the revenue base for each group of vessels varies substantially.

Note that the fee percentages identified in Table ES-3 would be charged to both vessels and processors. Catcher processors that both harvest and process groundfish or halibut would pay both a harvesting and processing fee, meaning that their total ex-vessel value fee assessment would be double the percentages identified in Table ES-3.

Table ES-3 Estimated observer days, coverage cost, and fee percentages for low, mid, and high endpoint fee options based on 2000-2003 average coverage days and ex-vessel revenues

Alternative	Observer days			Observer cost (millions)			Estimated fee %		
	Low	Mid	High	Low	Mid	High	Low	Mid	High
Alt. 3 (GOA-based)	5,288	6,525	12,340	\$1.88	\$2.32	\$4.38	0.49%	0.60%	1.15%
Alt 4 & 5 (Tiers 3 and 4 w/o CPs <125')	10,025	N/A	18,628	\$3.56	N/A	\$6.61	0.71%	N/A	1.32%
Alt. 4 & 5 (Tiers 3 and 4 with CPs <125')	12,680	17,660	22,066	\$4.50	\$6.27	\$7.83	0.82%	1.15%	1.44%

Finally, there are two major issues discussed in the analysis for which the Council is not being asked to make decisions at this time: 1) technological requirements and 2) the contracting process.

Technological requirements: Electronic fishing logs, electronic reporting requirements, and VMS

The analysis contains extensive discussions of a variety of technological requirements that would facilitate implementation of a restructured observer program under Alternatives 3 - 5. These include:

- **Electronic fishing logbooks** so observed and unobserved vessels can report fishing activity electronically from the fishing grounds.
- **Revised electronic reporting requirements** for processors that will facilitate the collection of ex-vessel fees.

- **VMS requirements** to enable NMFS to monitor and enforce compliance with check-in/check-out requirements.

While the above technological requirements may represent decision points for the Council at a future date, they are not currently presented as decision points for the Council in this analysis. This is primarily because all three types of technological requirements are part of larger program initiatives that will be developed on separate tracks. Therefore, this analysis does not propose making decisions related to these issues at this time.

Contracting process

Under all of the alternatives under consideration, private contractors would continue to be the source of observers deployed under the restructured program. The main difference under the restructuring Alternatives 3 – 5 is that NMFS would be the entity responsible for contracting for observer coverage rather than the vessel owner. Complicated regulations and procedures already govern the Federal contracting process. Therefore, this analysis does not examine alternatives to the process that would govern direct Federal contracting for observer services. The existing Federal contracting process is described in Section 4.8, to provide the Council and the public with an understanding of how the program would operate, should one of the restructuring alternatives be adopted. This section also explores the role of contractors under a new program, and whether single or multiple contracts, and single or multiple contractors, are preferable.

Several different contract modules are possible but are difficult to develop until the scope of work is defined. In essence, there are several ways to accomplish any task and distribute work. Contracting is flexible and will accommodate various desired scenarios. For example, the work can be broken into components regionally (BSAI or GOA), by gear type, or by vessel size class. Various combinations are possible. It is also possible to develop different types of work modules. One module could be for overall coverage planning and another for the provision of observers to obtain that coverage. Once the scope of work and funding are identified, NMFS can further develop alternative contract modules for consideration.

Because Federal contracting must follow well-established procurement processes, there are no Council decisions related to the contracting process in this amendment. Rather, NMFS will keep the public and the Council informed of the process as the scope of work becomes better defined.

Decision points for Council consideration

The primary decision point for the Council in this amendment is to select a final preferred alternative. Three alternative approaches (Alternatives 3 – 5) for restructuring the Observer Program are analyzed in addition to the no action alternative (Alternative 1) and an alternative to extend the current program beyond the December 31, 2007 expiration date (Alternative 2). **Note that the Council identified Alternative 2 as its preliminary preferred alternative in February 2006, for various reasons related to Congressional authority and cost uncertainties.**

However, the Council intends to initiate a new amendment with restructuring alternatives at such time that: (1) legislative authority is established for fee-based alternatives; (2) the FLSA issues are clarified (by statute, regulation, or guidance) such that it is possible to estimate costs associated with the fee-based alternatives; and/or (3) the Council requests reconsideration in response to changes in conditions that cannot be anticipated at this time. Thus, should the Council choose Alternative 2 as its final preferred alternative at final action, the restructuring alternatives in this analysis are intended to be used as a starting point in a future amendment package.

Should the Council choose one of the restructuring alternatives (Alternatives 3 – 5) as its final preferred alternative, each has several associated decision points. These include:

1. **Assignment of vessel classes and fisheries into tier levels.** NMFS has provided initial recommendations for the assignment of vessel classes and fisheries into the four proposed coverage tiers. The most significant change relative to the status quo is the proposed classification of trawl and hook-and-line CPs <125' in Tier 2. Because all tier classifications will be established in regulation, it is appropriate for the Council to review the proposed tier assignments and either endorse them or make alternative recommendations at the time of final action.
2. **Initial fee percentage.** Because the ex-vessel value fee percentage will likely be fixed in regulation, it is essential that the initial fee percentage be chosen after careful consideration of the future coverage objectives of the program. The analysis proposes three possible fee levels for consideration.
3. **Variable or fixed fee.** Because harvest levels, prices, and coverage costs vary annually, the Council may wish to contemplate establishing a variable fee that self-adjusts upwards or downwards based on multi-year running average. A 5-year running average is suggested in Section 4.5.1. Alternatively, the Council may choose to establish a fixed fee percentage in regulation that would require subsequent Council action and regulatory amendment to adjust.
4. **Use of standard or actual prices.** NMFS recommends the use of standard prices for the ex-vessel value fee program. However, it may be possible to develop a program based on actual prices for shoreside deliveries if there is sufficient interest in doing so.
5. **Restrictions on the use of fee proceeds.** This issue relates to whether fee proceeds should be limited to paying for costs directly associated with coverage by human observers or whether fee proceeds could also be used for supplemental or alternative monitoring technologies as they are proposed in the future.

Conclusions

The benefits and costs of the proposed action cannot be compared in a quantitative manner because the actual costs of the proposed restructuring alternatives (Alternatives 3 – 5) cannot be determined until a variety of labor issues are resolved (see Section 4.4). Furthermore, the benefits of the proposed action are qualitative or distributional in nature (e.g. improved data quality, sharing of costs). Nevertheless, a variety of qualitative conclusions can be drawn with respect to the benefits and costs of the alternatives.

Alternative 1, the no action alternative, would effectively result in the sunset of the North Pacific Observer Program on December 31, 2007, should no subsequent action be taken. Adoption of the no action alternative would result in significant costs to both industry and the environment. These costs are discussed in detail in Section 4.11.1. Without data collected by observers, NMFS would be forced to adopt a much more conservative approach towards managing the groundfish fisheries of the GOA and BSAI. Such an approach could include closing fisheries much earlier in the absence of observer data on groundfish catch and bycatch to prevent exceeding Total Allowable Catch (TAC) and Prohibited Species Catch (PSC) limits, and using more conservative population models to generate Allowable Biological Catch (ABC) and TAC recommendations in the absence of observer data for use in stock assessment modeling. Given that the total cost of the observer program is about 1.4% of ex-vessel value in the GOA

and BSAI, these types of precautionary management measures could cost the industry many times more revenue in lost fishing opportunities than the cost of the observer program.

In addition, failure to maintain a groundfish observer program in the North Pacific would violate the terms of a variety of statutes, including the Endangered Species Act, under which observer coverage has been mandated as part of reasonable and prudent measures (RPMs). RPMs are non-discretionary measures under current Biological Opinions that are prescribed under the incidental take statements for endangered marine mammals, salmon, and sea birds. Absent observer coverage, many of the groundfish fisheries could be found in jeopardy and subject to closure under the Endangered Species Act. The costs of widespread Endangered Species Act-mandated fishery closures across the North Pacific would likely exceed the costs of maintaining an observer program by orders of magnitude.

Alternative 2 would result in an extension of the existing program. This alternative is likely the only viable short-term alternative at this point, given the unresolved questions about labor costs under a restructured program and the lack of statutory authority to implement the multiple funding mechanisms contained in Alternatives 3 through 5. This alternative would not achieve some of the objectives outlined in the problem statement such as improvements to data quality and the reduction of disproportionate observer costs born by many small vessel operators. It also would not likely advance the data quality objectives contained in the preferred alternative of the Programmatic Supplemental Environmental Impact Statement prepared to evaluate the Alaska groundfish fisheries (NMFS 2004).

However, Alternative 2 would continue to provide the North Pacific groundfish fisheries with the benefits of the observer program, without which the costs identified under Alternative 1 above would occur. The benefits of observer coverage to the government, industry, and public are substantial. Through observer coverage, NMFS obtains accurate information upon which to base management and conservation decisions, which may increase economic opportunities for industry. The public also receives unbiased information about the use of a public resource that would otherwise occur outside the public view. These benefits include:

- **Estimates of takes of protected species.** Marine mammals and sea birds are protected by a variety of statutes aimed at minimizing potential negative interaction with fisheries and other activities. Chief among these statutes are the Marine Mammal Protection Act and the Endangered Species Act. Observers are necessary to collect data on marine mammal and seabird interactions with the fishing fleet to insure that protected species are not adversely impacted by fishing activity.
- **Prohibited species catch.** Many groundfish fisheries in the North Pacific are limited by bycatch of crab, salmon, halibut, and herring as well as by the harvest of the target species. Observers are currently the only reliable method through which prohibited species catch data can be collected in most North Pacific fisheries. Without observers, the catch of prohibited species could not be managed in an effective manner.
- **Estimates of discards of fishery resources.** Catches brought aboard fishing vessels are mainly sorted for marketable species and sizes, with the unwanted or non-marketable portion of the catch discarded at sea, if allowed. In some fisheries, large catches of undersized commercial species also occur and result in substantial quantities of the species catch being discarded. Accurate stock assessments require that all harvests due to the fishery, either as landings or discards, be measured. Measuring the effects of fishing activities on the ecosystem also requires information on catches of all species, even if they are discarded. Observer sampling provides the most reliable method of acquiring data on the quantity and species composition of discards, as well as

information on the specific reasons why species are discarded (i.e., size, no market for the species, fish damaged, etc). With these data, it is possible to more completely understand the effects of fishing and to estimate the potential biological and economic benefits of changes in conservation and management measures (i.e., minimum legal sizes, trip quotas for individual species, etc.).

- **Management of quota-based rationalization programs.** Observers are an essential element to the management of several quota-based rationalization programs in the North Pacific including the AFA pollock fishery, which is subject to individual cooperative quotas, and the CDQ fishery, which is subject to individual CDQ allocations. Without the haul-by-haul data collected by observers on vessels and processors in the AFA and CDQ fisheries, NMFS would be unable to manage the individual vessel quotas upon which the functioning of AFA cooperatives and CDQ groups is based. Without observers, the AFA and CDQ fisheries could not operate as designed.
- **Biological catch sampling.** Scientific observers aboard fishing vessels also collect spatially explicit biological samples of the catch. Size and age samples and other observations taken at sea (e.g., sexual maturity) are often not obtainable by sampling dockside landings, or if so, samples may be biased towards legal sizes or valuable species. Size and age samples of discards permit the estimation of discard size age composition, which often differs considerably from that of landings. In most cases, discard of marketable species are of small fish, although damaged legal-sized fish may also be discarded. Because observer sampling occurs throughout the year, the program affords an opportunity to collect samples of fish gonads and other parts to study seasonal cycles of sexual maturity and growth that may be difficult during annual survey cruises that occur at only one time during the year.
- **Design and monitoring of gear.** Reduction in discards of finfish and protected species has been attempted using a variety of methods, including the development of more selective fishing gear. The development and deployment of such gear requires testing (i.e., to ensure the gear can be safely and efficiently used) and validation (i.e., to ensure this gear is having the intended effect). Observer data can provide important information about the use and effectiveness of fishing gear.
- **Monitoring of experimental fisheries.** Experimental fisheries have frequently occurred in the North Pacific when industry has sought to test fishing gear under controlled conditions, or develop fisheries that conflict with current regulations. Observer data gathered during experimental fisheries provides important data on the effectiveness of the gear or fishing strategy being tested.
- **Gear performance and characteristics.** To support research, scientific observers that are deployed aboard commercial vessels can be requested to make detailed measurements of various attributes of the fishing gear including how it is rigged and deployed. These measurements can be important for two reasons. First, by noting variables of mesh size, number of hooks, gangion length time of trawl tow, etc., in relation to the catch attributes (quantity, species composition, size distribution of catch) it is possible to conduct statistical analyses of the factors that result in high (or low) rates of discard, species mix, changes in catch rate, etc. Second, gear performance observations, when collected over time, can be used to better calibrate catch-per-unit-effort abundance measures. For example, if the average size of nets, duration of tow, ground-cable length, etc., increases over time, these may have a direct effect on catch per day of the fleet (even for same sized vessels). Given sufficient information, these factors can be included in research assessment analyses to provide a more complete and accurate picture of fishing intensity and effectiveness.

- **Communication with fishermen.** Observer programs provide a channel for two-way communication between fishermen and fishery scientists and managers. The program is an important link between NMFS and fishermen. Ideas, complaints, and information communicated between observers, captain, and crew are a valuable source of information for all parties.

In summary, Alternative 2 would not achieve some of the objectives of the problem statement. However, this alternative is the only viable alternative at this point in time, due to existing obstacles which prevent a comprehensive analysis of potential costs under the FLSA and a lack of statutory authority for a comprehensive cost recovery program. **Thus, Alternative 2 would achieve the primary objective of the problem statement to maintain a groundfish Observer Program beyond the current expiration date of December 31, 2007.**

Alternatives 3 and 4 present two distinctly different approaches to partial restructuring of the Observer Program. The scope of Alternative 3 is based on geographic area. Under Alternative 3, all groundfish fisheries in the GOA and all halibut fisheries throughout Alaska would be covered by the new program, in which vessels would pay an ex-vessel value based fee and NMFS would directly contract for observer services. By contrast, Alternative 4 is based on coverage levels irrespective of geography. Under Alternative 4, all vessels and processors assigned to Tiers 3 and 4 (less than 100% coverage) would be covered by the new program and all vessels and processors assigned to Tiers 1 and 2 (100% or greater coverage) would be excluded and continue to operate under the existing pay-as-you-go system. Table ES-4 compares the advantages and disadvantages of these two separate approaches for partial restructuring.

While neither Alternative 3 nor 4 would completely address all of the issues in the problem statement because the largest portion of the observer program would remain unchanged, it is possible to draw some conclusions about the differences between these two different approaches. From an operational standpoint, Alternative 3 is likely superior to Alternative 4 because it would allow NMFS to develop scientific-based sampling plans for specific fisheries in the GOA and to implement them with single contracts that would govern all coverage in each fishery. Under Alternative 4, NMFS would only have direct control over deployments on Tier 3 and 4 vessels in each fishery and would be less able to develop efficient approaches to the deployment and rotation of observers within a fishery. However, Alternative 4 would better address concerns about the disproportionate costs faced by the operators of smaller vessels because it would extend the program to all Tier 3 and 4 fisheries in the BSAI as well as the GOA. Alternatives 3 and 4 therefore represent a tradeoff between developing a more unified and scientific-based sampling program for the GOA as a whole, and addressing the problem of disproportionate costs for a wider range of vessels in the BSAI and GOA. Furthermore, both Alternatives 3 and 4 raise a variety of issues associated with the administration of two separate programs. Attempting to administer two separate programs could generate a variety of operational and data quality issues, as discussed in detail in Section 4.9.

Note that a comprehensive analysis of Alternative 3 or 4 is not possible at this time, due to the inability to adequately estimate the costs of a restructured program under the Fair Labor Standards Act and Service Contract Act. In addition, new statutory authority is necessary to implement an observer program that would assess a fee for observer coverage to only a subset of the vessels in the fisheries for which the Council and NMFS have the authority to establish a fee program. Under Alternative 3, only groundfish fisheries in the GOA and all halibut fisheries throughout Alaska would be assessed an ex-vessel value based fee. Under Alternative 4, all vessels and processors assigned to tiers with less than 100% coverage would be assessed an ex-vessel value based fee. All vessels and processors not included under the new program would continue to operate under the existing pay-as-you-go system. It is not certain whether the statutory authority necessary to implement Alternative 3 or 4 would be promulgated prior to the

expiration of the existing Observer Program on December 31, 2007. This issue is described in Section 2.8.1.

Alternative 5, the comprehensive alternative, is the only proposed alternative that would address the problem statement in its entirety while avoiding new complications associated with the management of two separate programs in the GOA and BSAI. The primary disadvantage to this approach is the scope. A comprehensive restructuring of the entire North Pacific Observer Program is a large and complex undertaking, and there are likely to be more short-term complications and disruptions to observers, observer providers, and the fishing industry if the entire program is restructured at once. Alternatives 3 and 4 would allow NMFS to get a new program up and running in most smaller-scale fisheries of the GOA that are less dependent on observer coverage without initially affecting the large-scale fisheries in the BSAI where most observers are currently deployed. However, operational difficulties introduced by managing simultaneous programs may offset some of the benefits of restructuring smaller scale fisheries initially.

Note that a comprehensive analysis of Alternative 5 is also not possible at this time, for the same reasons described under Alternatives 3 and 4. The cost associated with Alternative 5 cannot be adequately estimated at this time, due to unresolved questions regarding the application of both Fair Labor Standards Act and Service Contract Act provisions. In addition, new statutory authority is necessary to implement an observer program that would assess a fee for observer coverage to only a subset of the vessels in the fisheries, or assess a different fee on various fleets, for which the Council and NMFS have the authority to establish a fee program. Under Alternative 5, some vessels (with 100% or greater coverage requirements) would pay a daily observer fee and some vessels (with coverage requirements less than 100%) would pay an ex-vessel value based fee. It is not certain whether the statutory authority necessary to implement Alternative 5 would be promulgated prior to the expiration of the existing Observer Program on December 31, 2007.

Additionally, rulemaking extending the current program beyond 2007 on an interim basis would likely need to be promulgated prior to NMFS being able to implement a restructured observer program under Alternatives 3 - 5.

Table ES-4 Comparison of the advantages and disadvantages of the approaches in Alternatives 3 and 4

<i>Issue</i>	<i>Alt 3 (GOA-based)</i>	<i>Alt 4 (Coverage level-based)</i>
<i>Sampling design and data issues</i>	Because fisheries are generally managed by area rather than size class, Alternative 3 would allow NMFS to design a complete sampling and data collection program for each GOA fishery. Observer coverage for a specific fishery operating in a specific geographic location could be a single contractor.	Under Alternative 4, NMFS would be dealing with multiple contractors and would have control over observer deployments for only a subset of vessels in each fishery in which Tier 1 and Tier 2 vessels participate. This will make it more difficult to design coherent sampling programs and observer rotations for fisheries in which vessels from different tiers participate.
<i>Cost-containment and contract efficiency</i>	Geographic-based modules are likely to be simpler to design and bid on because observer providers will be bidding on exclusive contracts to provide coverage for a specific geographic area or port. Also, increased potential for cost containment exists if observer providers can focus on discrete geographic areas because there will be reduced down time and transportation costs if observers do not need to be rotated between geographic regions.	Observer providers may find it more difficult to bid on contract modules that are focused on vessel size classes or coverage tiers rather than geographic areas because they may not have adequate advance knowledge of where the group of vessels they are bidding on will be fishing and out of which ports they will be operating. A contract in which an observer provider is responsible for limited coverage of vessels across a broad geographic area may also increase costs due to increased down time and transportation costs during observer rotations.
<i>Disproportionate costs for smaller vessels</i>	Alternative 3 would address concerns about disproportionate costs for GOA vessel only. It would not address concerns about disproportionate costs paid by small vessels operating in the BSAI.	Alternative 4 would address the issue of disproportionate costs for all vessels operating in Tiers 3 and 4 regardless of where they are operating in Alaska.
<i>Complications with crossover issues and the management of two separate program:</i>	Contracting complexities and crossover issues could arise for vessels that are moving between the GOA and BSAI under Alternative 3. These could be mitigated to some extent, if subcontracting was allowed and if the same observer providers who earn contracts in the GOA are allowed to provide coverage in the BSAI.	Crossover issues would be minimized if a single contract for coverage follows Tier 3 and 4 vessels regardless of where they operate within Alaska.

Discussion Paper on Issues Associated with Large Scale Implementation of Video Monitoring

Alan Kinsolving, National Marine Fisheries Service
May 26, 2006

Introduction

Video, either alone or in conjunction with other data gathering equipment (electronic monitoring, or EM), is becoming an increasingly viable technology for monitoring some types of fishing activity or enhancing the ability of observers to gather fisheries data. The technologies associated with EM are in a state of rapid development. The combination of increasingly effective data compression algorithms, increased computer processing power, and the rapidly decreasing cost of data storage have reached a point where, on a technology level, electronic monitoring is ready for large scale implementation for some fisheries monitoring applications. However, while many of the technical issues associated with the collection of EM data have been addressed, neither NMFS nor the fishing industry have fully addressed many of the infrastructural and cost related issues associated with larger scale EM program implementation. Finally, EM technologies are complex and rapidly changing while our ability to implement regulations is comparatively ponderous. In other applications, this has created situations where older technologies are effectively enshrined in regulations and, as we seek to develop effective EM programs a regulatory framework that allows us to keep pace with technological change will be necessary.

This paper attempts to summarize the state of current technology, and to discuss issues associated with larger scale implementation of EM as part of any fisheries monitoring program.

Current Technology—What EM systems can and cannot do well

Based on studies conducted to date, it appears that EM technology is able to:

- Function sufficiently reliably in the marine environment.
- Identify fishing events (e.g. net deployment, line retrieval) and the location where those events took place.
- Determine when and if discard events take place on trawl catcher vessels.
- Verify compliance with seabird avoidance measures on longliners.
- Assist an observer in monitoring activities in otherwise unobservable areas of catcher/processors.

On the other hand, EM systems are only moderately able to:

- Quantify the amount of discards on trawl vessels.
- Detect and identify seabird bycatch to species on longliners.
- Estimate the species composition and number of fish in longline catch.

The at-sea portion of the technology, while the focus of most research to date, is only one component of an effective EM system. For an EM system to function properly, the data collected at-sea must undergo some degree of methodical review. In the studies conducted to date, this review has been fairly meticulous, with the assumption being that most missed events have been due to technology and data collection issues rather than data review issues. While such an approach is necessary when testing the applicability of a given technology, it does serve to possibly over inflate the total cost of an effective EM program. Further, at least a portion of EM data must be curated for further review and/or use in the prosecution of violations. Such curation may require a large investment in data storage infrastructure.

Infrastructural issues—roadblocks to large scale implementation

EM can't replace a human observer. In quota based fisheries, such as the rockfish pilot program, it appears that EM could be used to ensure that quota species are not discarded at-sea. However, the rockfish pilot program was designed around 100 percent observer coverage for two reasons. One was to ensure that allocated species were not discarded; the second was to ensure that halibut prohibited species catch quota, which must be discarded at sea, was accurately accounted for. While EM has shown some promise at quantifying catch, it has not been tested against observer data for this application. Unfortunately, scenarios of this type are more the rule than the exception. In most applications where video could possibly be used for routine monitoring of some fishing activities, it would only be possible to reduce observer coverage levels to the extent that the higher observer coverage is for the sole purpose of routine monitoring. In most cases, however, the observer also performs an important role in the collection of data necessary for accurate catch accounting, stock assessment, and the collection of other biological data.

The level of technology may become "fossilized" at the time when large scale implementation takes place. EM technology is, as has been discussed, in a state of rapid evolution and each year has brought significant and meaningful improvements in the availability and cost of EM products. Unfortunately, at the point where a given technology is adopted and large scale implementation takes place, it becomes more difficult to incorporate new technological developments. This can occur for two reasons. First, the Federal regulatory process is not designed to respond rapidly to technological evolutions and developments. More importantly, there are significant costs associated with adopting any given technology. Once those costs have been paid, a newer technology must demonstrate a significant advantage before it is likely to be adopted. As an example, the gaming industry in Las Vegas was probably the first industry to implement large scale video monitoring. Because this implementation took place prior to the availability of digital video, the vast majority of casinos are still reliant of analog video systems where a single camera records directly to a single VCR. Since the average casino has 3,000 individual cameras recording 24 hours a day and the tapes are generally maintained for at least seven days, the number of VCR tapes recorded by even a small casino is prodigious. Clearly it would be an advantage to the gaming industry to use digitally based systems. However, because of the significant investment in analog equipment, this transition is only now starting to occur.

Costs, at this time, may be similar to or even greater than, the use of observers. An analysis of the costs associated with implementation of EM in the rockfish pilot program is attached as Appendix 2. Based on this project, use of EM may not result in any large scale cost savings for the fleet, primarily because of the costs associated with the analysis of the EM data. However, new software tools designed to assist in data review are being developed that may significantly reduce the time for routine data review. Further, it may be possible to reduce these costs through less meticulous analysis of the EM data in certain circumstances. Clearly, however, a reduction in analysis time will reduce the frequency with which various events are identified. Determining the extent to which this is the case has not been researched.

Another problematic aspect of EM costs is determining how these costs should be apportioned between the fishing industry and NMFS. Depending on that allocation, the nature of the regulatory program implementing EM could vary dramatically. For example, in a program where NMFS paid the cost associated with data analysis, the regulatory structure could be comparatively simple since vessels would only be expected to submit EM data to NMFS in a timely fashion. Aspects of the EM program "downstream" from the actual collection and submission of EM data would be handled outside of regulations. However, the cost burden imposed on NMFS by such an approach would be significant and funding mechanisms would have to be identified if a credible program is to be created.

Each application for EM is different, and could require different standards and equipment. System specifications such as the frame rate, amount and type of allowable data compression, individual image size, number of required cameras, and the extent to which EM data must be retained or submitted for analysis could vary widely depending on the application. Clearly, a frame rate and image size that is adequate for determining whether a vessel has deployed seabird avoidance gear would be inadequate for determining whether or not crew discarded a single fish.

For example, in the hake fishery off Oregon and Washington, an EM system is being used under an EFP to ensure that there is no discard by catcher vessels. Such a presence/absence application is simpler than what would be required under the rockfish pilot program where the discard of some species will be required, while the discard of other species will be prohibited. In order to make such a system work, vessels would be required to ensure that all discard took place in specified locations so that it was clear exactly what is being discarded. Thus, application of an EM program in the hake fishery could conceivably take place without requiring changes in crew behavior or vessel layout, whereas application in the rockfish pilot program would probably require both.

As each application for EM is developed, there will be many individual decisions to make that will affect the viability and cost of the resultant program. Because each application is different, this may be a time consuming process. As an example, for a recent NMFS roundtable discussion concerning implementation of EM, a series of decision points in a generic EM program were developed (see Figures 1 and 2). While these decision trees are clearly not exhaustive, they do serve to give a sense of the complexities associated with the process.

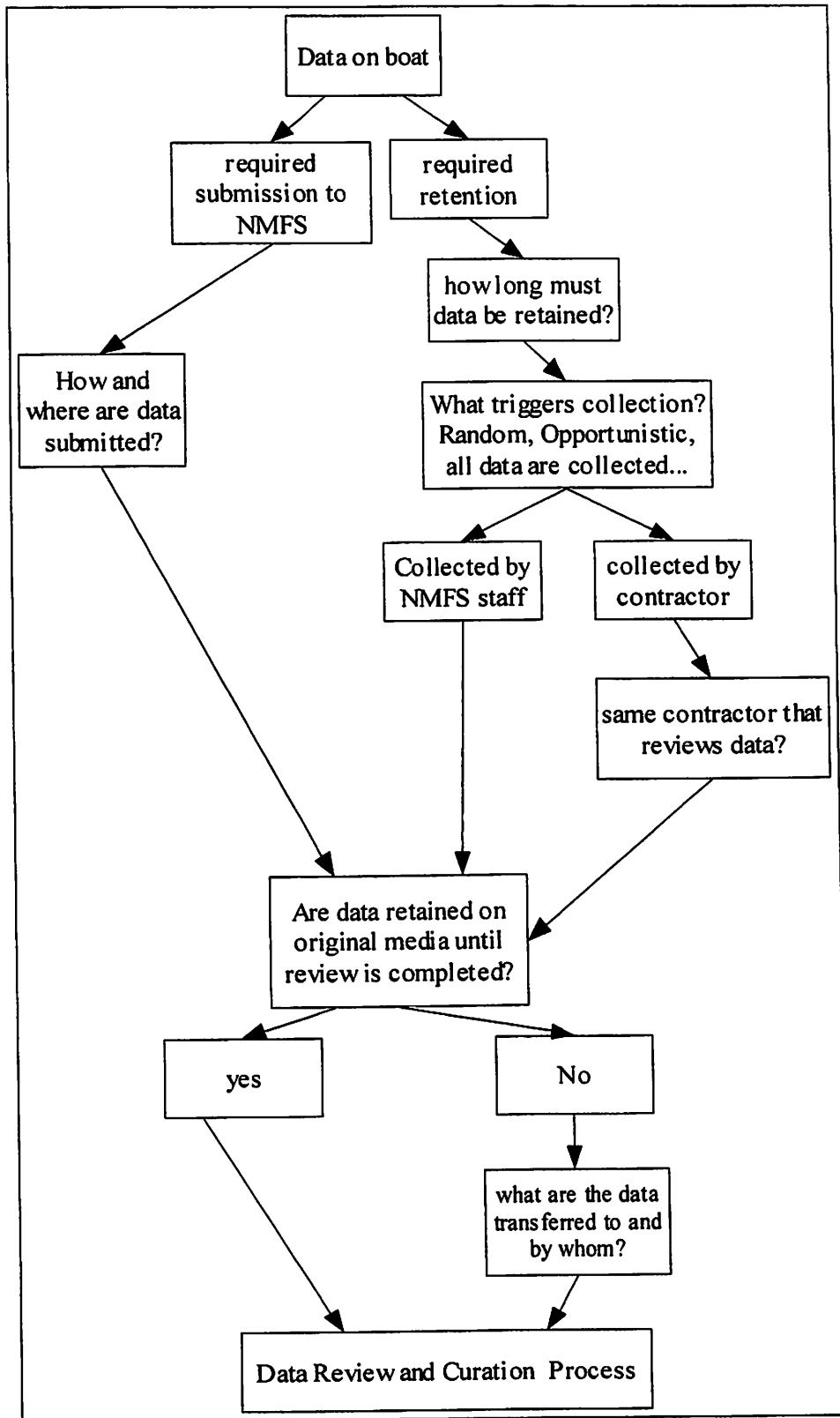


Figure 1. Some of the decision points associated with the data collection process. This does not include decision points related to the actual EM system data recording, nor to those associated with the review and curation of the data.

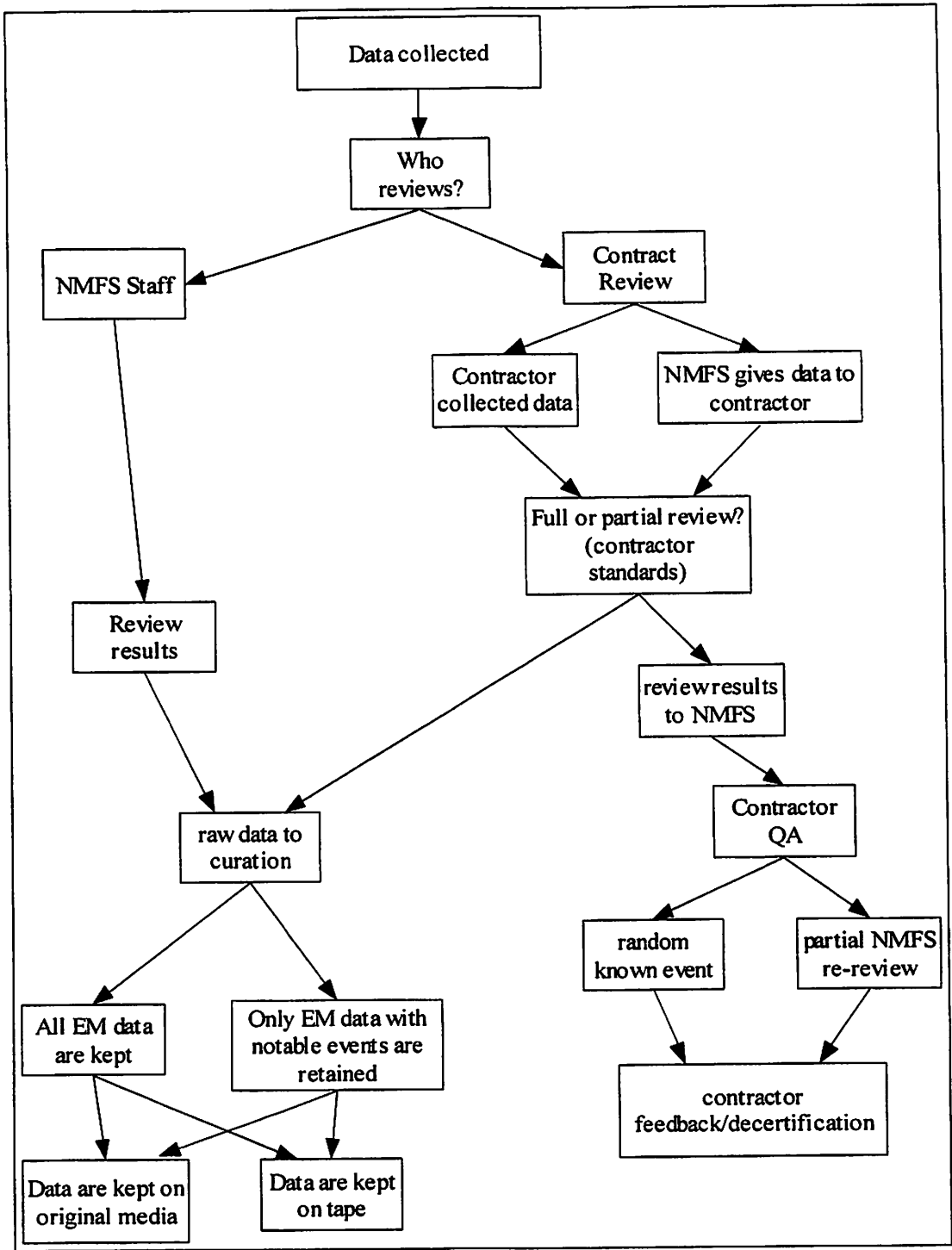


Figure 2. Some of the decision points associated with the data review and curation process. This does not include decision points related to the actual EM system data recording or collection processes.

Regulatory Pathways

As has been discussed above, EM is complex and implementation of an effective program will involve numerous challenges for NMFS as well as the fishing industry. Clearly an effective program must be flexible enough to change as new technologies are introduced and our knowledge of those technologies increases. Finally, the total costs for any large scale program will be high whether borne by NMFS or the fishing industry. Thus, an effective program will have to balance issues of cost, program oversight, flexibility, and enforceability. However, fundamentally, the nature of an EM program is based on the extent to which NMFS exerts direct control over the technology and data flow. In general, as agency control increases, the ability to ensure quality data and respond to changes in technology would be expected to increase, but so would costs and other demands upon NMFS.

In order to framework the problem, we have described four regulatory scenarios ranging from intensive NMFS management of an EM program to minimal NMFS involvement. For each scenario, we have attempted to describe the impact on program costs and anticipated outcomes based on a set of six benchmarks described below. While this crosswalk of benchmarks and scenarios was developed using the implementation of an EM program for monitoring discard in the rockfish pilot program, it is broadly applicable to any EM program. Ultimately, of course, any set of regulations will combine multiple aspects of these approaches.

Benchmarks

Cost to NMFS. Even the lowest cost implementation of EM would involve a significant commitment of NMFS resources. As an example, a projection of the costs associated with large scale implementation of EM in the rockfish pilot program can be found in Appendix 2. For the purpose of this crosswalk, the options have been ranked from highest to lowest cost for NMFS.

Cost to Industry. To a great extent, the regulatory framework determines who takes on the cost burden. As costs increase for NMFS, costs to industry would decrease.

Review Control. How well can we ensure that EM data is properly and reliably analyzed? This benchmark covers the data review process.

Technology Oversight. How well can we ensure that the systems are reliable and that they are appropriate for collecting the “right” data? This includes issues related to camera type, image quality, compression, frame rate, security, system storage capacity, and at-sea system reliability. In effect, this benchmark covers the technical aspects of the system from trip start to the point that the data leaves the boat.

Installation Oversight. How well can we ensure that the system is recording the “right” things at the right times in the right way? One of the lessons learned from the 2005 summer trawl project is that camera location and overall system design is an iterative process. Vessels are uniquely configured and issues on one boat may not be issues on

another. This benchmark covers issues related to system installation and appropriateness such as camera placement, lens selection, and number of cameras.

Enforceability. To what extent does the approach facilitate or hamper enforcement?

Flexibility. As conditions change, how well can the system adapt.—either because of the introduction of new technology, changes in the expectations for an EM system, or changes in available budget. In the case of EM, this is a critical component because of the rapid development of the technology.

Regulatory Scenarios

Full NMFS Ownership. Under this scenario, NMFS would purchase, own, and install all EM equipment. We would also be responsible for collecting and analyzing all EM data. Such an approach would give the agency the greatest flexibility to respond to the development of new technologies and would also give us the greatest oversight over all aspects of the EM process. However, the costs would, unless a fee collection program could be implemented, be borne totally by NMFS.

Approved Contractors. Under this scenario, NMFS would approve EM system contractors based on regulatory specifications. This process would be similar to the existing observer program. The approved contractors would be responsible for installing and maintaining EM systems that met certain criteria and would also be responsible for collecting and analyzing the EM data. NMFS' role would be one of data quality control and auditing. The primary advantages of this approach are that it would allow us to tap into existing expertise and place the majority of the costs onto the industry. However, developing regulations that, on one hand, provided sufficient flexibility for approved contractors to exploit new or different technologies, while at the same time giving NMFS sufficient control, could be problematic. Further, because all raw EM data would pass through the hands of contractors, issues related to chain of custody and data control could be more difficult to resolve. Costs under this model could be born totally by the industry, or the analytical costs could be paid by NMFS. For the purposes of this crosswalk, we assume that all costs are paid by industry.

Type Approval. This is the model currently used for NMFS approved VMS systems and scales. It has three major shortcomings. First, it would be slow to respond to changes in technology; second, it would be very difficult to address issues related to installation oversight; and third, it would be very difficult to write approval standards for the wide variety of possible installation scenarios. To give one example, a wide angle lens combined with a detailed image may be the best choice for a camera that is used to give an overview of the entire deck, whereas a narrower field of view and a smaller, less detailed image might be more appropriate for a discard chute.

Performance Standards. Under this scenario, regulations would specify what the system had to do, not how it had to be done. This approach would allow more rapid adoption of new technology and would more effectively cover issues related to installation. However, enforcement of performance standards can be problematic if not carefully crafted to avoid ambiguity. Further, given the wide variety of available equipment and file types, the data

stream could be complex and hamper the analysis process. Finally, a performance standards based approach would be expected to be more labor intensive for NMFS to administer, resulting in higher costs than a comparatively simple type approval process. This is the approach currently under development to allow the use of EM for monitoring personnel in fish bins on catcher/processors in the rockfish pilot program and for Amendment 80.

Table 1. Benchmark and scenario crosswalk. This table qualitatively summarizes the relative advantages and disadvantages of the four scenarios relative to benchmarks. Rankings are numeric (four being relative worst and one being relative best from the perspective of NMFS).

approach	Benchmark						
	Cost to NMFS	Cost to Industry	Review Control	Technology Oversight	Installation Oversight	Enforceability	Flexibility
Full NMFS ownership	Highest(4)	Lowest(1)	Highest(1)	Highest(1)	Highest(1)	Highest(1)	Highest(1)
Approved contractor	Lowest (1)	Highest(4)	Lowest(4)	Medium Low(4)	Lowest(3)	Lowest(4)	Medium(2)
Type approval	Medium(2)	Medium(2-3)	High(2-3)	High (2)	Low(4)	Medium(2)	Lowest(4)
Performance Standards	Medium(3)	Medium(2-3)	High(2-3)	Medium(3)	High(2)	Medium(3)	Medium(3)

Conclusion

EM technologies have clearly developed to the point where they can be used to enhance or even replace human observers for certain routine monitoring functions; but because each potential application for EM seeks to answer different questions, different approaches to implementation will be necessary for each application and many infrastructural, cost, and regulatory issues remain to be resolved. We anticipate that the first large scale implementations of EM will be for comparatively simple applications where EM supplements, rather than replaces, human observers. For example, we are in the process of developing an EM based option for catcher/processors participating in rockfish pilot and Amendment 80 fisheries. This option would be one of several bin-access choices that catcher/processor owners could make and would allow crew access to fish bins while at the same time giving the observer an additional tool for ensuring that crew are not presorting catch while in the bins. On the other hand, regulatory complexity and the fact that 100% observer coverage is necessary for accurate halibut PSC quota accounting, precludes the development of an EM option for catcher vessels participating in the rockfish pilot program at this time. Other Regions have successfully "implemented" larger scale programs through the use of EFPs, and this may be a mechanism for continued development of these more complex programs.

NMFS is encouraged by the rapid development of EM technologies and believes that they will play an important future role in the routine monitoring of fishing and fish processing activities. We have established a working group within NMFS that will focus on: developing priorities for future research; developing "best practices" for the analysis and handling of EM data; investigating new technologies; and resolving infrastructural and regulatory issues associated with large scale program implementation.

Appendix. 1. Overview of the 2005 Kodiak electronic monitoring project

Project Summary. During the summer of 2005, video based electronic monitoring (EM) systems designed by two companies (Archipelago Marine Ltd and Digital Observer Inc) were deployed on a total of 10 catcher vessels. The group of vessels covered represented a good cross section of more than a third of the rockfish fleet and included the largest as well as the smallest observed vessels that regularly fish for Gulf rockfish. The goal of the project was: 1) to determine whether an EM system could be used to determine if at-sea discard occurred and 2) whether that discard consisted of quota species that would be required to be retained under the rockfish pilot program, or halibut, which would continue to be a required discard. Over the course of the project, 1,463 hours of fishing activity (towing and catch handling) representing 433 sets were recorded and reviewed. For 194 of those sets, we were able to compare EM records of discard with vessel observer records of discard.

Key Findings.

- The Archipelago systems were highly reliable. 99.99 percent of the sensor data and 99.4% of the video data that could have been collected was. The Digital Observer systems were less reliable. Only 76% of the sensor data and 70.6% of the video data that could have been collected was. With the exception of a bad batch of cameras, failures were due to installation and operations errors rather than unreliable equipment.
- Industry cooperation throughout the project was good. While reservations about the invasive nature of the technology were almost universally expressed by skippers, boat owners, and crew, most appeared ready to adopt the technology if it resulted in clear savings.
- Over 80% of reviewed hauls had discard detected. The discard occurred in three primary ways: large quantity discard of unsorted catch (net bleeding); large quantity discard of sorted or partially sorted catch (shoveling); and small quantity discard of sorted catch.
- Net bleeding was rare. However, EM failed to detect this behavior on the one occasion where it was noted by the observer. Camera placement (lack of a good view over the gantry) appeared to be the problem.
- Approximately 10% of sets had shoveling type discard events. Because fish were discarded in multiple locations and in high volume, identification of individual fish or quantification of the amount of discard was not possible.
- For small quantity discard events, it was generally possible to tell by morphological category (i.e. flatfish vs. roundfish) what the discard consisted of.
- Observer data and EM data agreed 86% of the time on the presence/absence of discard events.

	EM Sets with Discard			
		Yes	No	Total
Observer sets with discard	Yes	146	22	168
	No	6	20	26
TOTAL		152	42	194

- For the 22 events where the observer noted discard and EM did not, reanalysis of the video noted discard on 9 of the hauls indicating reviewer error. Other missed events may have been due to the observer sampling out of sight of the camera or bad camera placement.
- Observer data and EM agreed 78% of the time on the presence/absence of halibut discard events. Re-review of those 28 hauls where the observer noted discard and EM did not were similar, with reviewer error accounting for 13 of those hauls.
- Overall, both systems appear adequate for detecting and categorizing smaller scale discard events. Determination of species group would be dramatically improved if all discard was required to be made through one or two discard chutes.
- Time analysis data presented in the final report allows us to project the actual costs associated with implementing a similar program (see cost data below). The review costs represent the largest share of the expenses. If industry is required to bear these costs, savings realized over using observers may be minimal.

Appendix 2. Implementation cost projection for full implementation of EM in the rockfish pilot program

Assumptions. Cost projections for rockfish pilot program EM are based on the following assumptions:

- The current fleet of approximately 25 boats will consolidate to 18 actively participating boats;
- participating boats will fish an average of 7 trips each; and
- trip length will average 3 days, of which there will be 24 hours of activity that will need to be reviewed.

Hardware and installation costs. These costs are comparatively simple to estimate and would not be as dependent on the exact program contemplated. The Archipelago and Digital Observer systems both appear to be of adequate quality to capture the majority of discard events and serve as a good base point for cost estimation. Archipelago publishes the cost for a complete system and that cost is used in this estimation. However, assembling a system from off the shelf components would reduce these costs considerably. In addition to the actual cost of hardware, system installation and maintenance costs must be considered. For the Archipelago systems, seven vessels required 264 hours for installation and 100 hours for maintenance. Installation times ranged from as little as 10 hours (for vessels already equipped for video in the hake fishery) to as many as 65 hours per vessel. Unfortunately, system installation times for the Digital Observer Systems were not reported.

Out of the box digital video recording systems exist that may be less costly and offer similar reliability rates. However, most use proprietary data compression and very few are equipped with a USB external hard drive. Because of these shortcomings, they were not considered here. Equipment related costs are summarized below.

	min	max
Equipment costs		
Cameras	1500	--
DVR computer system	2000	--
hard drives for at-sea data storage	250	125
Miscellaneous	500	--
package system	--	8000
Labor *		
installation	650	4225
maintenance	975	975
TOTAL EQUIPMENT COSTS	5875	13325

- * labor costs are only for system installation and maintenance, data collection and analysis costs are not included. Costs are based on a labor rate of \$65/hr.

Data collection and at-sea storage. Once again, the Archipelago and Digital Observer systems appear to capture data of an adequate quality. Both systems use compression algorithms to reduce the size of the video files. These algorithms are most effective when there is little or no motion in the camera view and least effectively when there is a great deal of motion. Therefore, it isn't possible to give an exact data capture rate per camera. However, over the course of the project, both systems captured data at a rate of approximately 0.7 Gb/hr. For this project, data were collected from the time vessels left the dock until they returned to port. Given that most trips are three days or less, a system must be capable of storing at least 50 Gb per trip. Assuming all data should be backed up, and a vessel would not wish to be trip limited based on the capacity of their video system, it is reasonable to assume a system of two 100 GB hard drives would be sufficient for the actual collection of data.

Data Maintenance and storage. These costs would vary enormously depending on the program requirements. At one extreme, vessels could be required to submit all of the raw data to NMFS. Probably the most practical way to do this would be to require that data be recorded onto a USB compatible external hard disk submitted to NMFS. Assuming vessels choose to use 100 GB hard drives for recording the data, this would impose a per trip cost of approximately \$100/trip, for a total fleet-wide annual cost of approximately \$12,500. At the other extreme, vessels could be required to make the data available to NMFS during the offload and they would not be required to store or maintain the data after each trip. This would allow the vessel to reuse hard drives and data storage costs for the vessels would be minimal. Vessels could also be required to maintain the EM data for a period of one year (for example) and make those data available to NMFS upon request. Assuming an average of 21 fishing days per vessel/year, this would require one 400 GB hard drive per vessel, at a cost of approximately \$400, or approximately \$7,200 fleet-wide. Costs in subsequent years would be limited to maintenance/replacement of those hard drives.

Assuming NMFS chooses to collect all of the EM data, approximately 20 terabytes of data per year would need to be stored. Estimating these costs is difficult and would depend on the data management system developed. However, to give a sense of the magnitude of the problem, the Alaska Region currently has a disk array capable of being expanded to 4.5 terabytes and a tape changer that will hold 12 terabytes. Clearly, any regulatory program that envisions the long term storage of most or all of the EM data would require a significant increase in data storage infrastructure. While tape storage is currently the most appropriate medium for storing digital video data in terms of cost/accessibility/stability, the transferring of raw video data to another medium could raise chain of custody issues. These issues have been discussed in other forums by other agencies, but raise the point that a long term storage solution must be carefully designed.

Data review. These costs could vary enormously depending on how much data are reviewed and by whom. The most practical way to look at review costs is the ratio of activity time to review time. In this case, activity time was considered the period when fish were on the deck and sorting/stowing of catch was taking place. In other words, a trip with 24 hours worth of activity that required 2.4 hours to review would have a review ratio of 0.1. For the Kodiak project, review ratios for Archipelago systems ranged from a low of 0.03 to a high of 0.74. Digital observer review times were not reported on a trip by trip level, but had an average review ratio of 0.55.

We hope to use an upcoming project to better estimate the extent to which faster review results in missed discard events. At this time it isn't possible to say to what degree review times can be reduced while still maintaining an accurate record of discard. Assuming review would require an average review ratio of 0.4, review would require approximately 3600 man hours per season. These costs could be reduced by:

- less meticulous review
- review of a randomly selected subset of trips or hauls
- the use of image recognition software to pre-screen sections of data that need human review (i.e. an image recognition program could be "taught" to identify the periods when fish are actually on deck)
- not routinely reviewing observed trips

Additional man hours would be required for tabulating and reporting discard events. Assuming data review costs are approximately \$40/hr, full review for the rockfish pilot program would cost approximately \$50,000/yr.

Public Testimony Sign-Up Sheet

Agenda Item C-5 OBSERVER PROGRAM

	NAME (PLEASE PRINT)	AFFILIATION
1 X	Paul McGuyer/BRENT PAINE	At-Sea Processor + Comm/UCB
2 X	Stephen Toufen/Ku Dahtermann	100% Coverage Proposal - Lu D.
3 X	MARK BUCKLEY	DIGITAL OBSERVER INC.
4 X	Julie Brannan	AGDB
5 X	JOHN GALVIN	MARINE CONSERVATION ALLIANCE FOUNDATION
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

NOTE to persons providing oral or written testimony to the Council: Section 307(1)(I) of the Magnuson-Stevens Fishery Conservation and Management Act prohibits any person "to knowingly and willfully submit to a Council, the Secretary, or the Governor of a State false information (including, but not limited to, false information regarding the capacity and extent to which a United State fish processor, on an annual basis, will process a portion of the optimum yield of a fishery that will be harvested by fishing vessels of the United States) regarding any matter that the Council, Secretary, or Governor is considering in the course of carrying out this Act.