GROUNDFISH MANAGEMENT TEAM REPORT ON THE ELECTRONIC MONITORING REGULATORY PROCESS

The Groundfish Management Team (GMT) held a publicly noticed webinar to discuss Electronic Monitoring (EM) Program regulatory issues (on Tuesday, June 10, 2014). Council staff and the committees have done a considerable amount of work in a relatively short amount of time. However, we do not see how the Council could choose preliminary preferred alternatives at this point, at least for the core program design elements like those in Section 2.2. At the same time, preparing for this last meeting of the 2015-16 harvest specifications and management measures cycle has involved a lot of work for members of the GMT. We therefore may be behind the Council and other advisory bodies as to comfort and understanding of how EM might work.

We begin with some general thoughts on how the team has reviewed or would continue reviewing the EM alternatives and options. In following the team's analytical role, we attempt to focus on the risks and incentives that affect catch accounting. The overall thrust of our statement involves suggestions on where the analysis might focus next. If we had more time for writing and discussion, we would have had more detailed comments including on specific alternatives. And with more time over the coming months, we believe we could provide valuable input on the design of the EM programs.

Purpose of Observers and Electronic Monitoring

We have noted some confusion in discussions at this meeting and before about the purposes observers and EM serve. Discussions around EM often make a distinction between "science" and "compliance" with the point being made that EM is mainly for compliance and not for science. We understand "science" to refer to measurements like taking the lengths and sex of fish as part of stock assessments (i.e., biological data collection). Yet the GMT finds this distinction to be of limited helpfulness. EM may be designed mainly around compliance yet that compliance is meant to serve accurate catch accounting. Likewise, the core purpose of the West Coast Groundfish Observer Program (WCGOP) observers has been to account for discards and to take other measurements that cannot be made onshore (e.g., collecting sablefish otoliths). In other words, their main role has been to perform total catch accounting.

Our point here is that it would be helpful to list the specific observations/measurements/tasks that observers conduct and to consider, one by one, how they can or cannot be made under EM in conjunction with state port sampling programs, etc. There are likely to be trade-offs and information lost (e.g., of interest to the GMT is that we might lose tow by tow catch information under EM), yet it may be that many observations can still be made onshore under EM programs where most fish are retained. Furthermore, it is possible that EM might improve some types of observations.

We would recommend that the Council consider these issues in the full context of sampling design, the accuracy and precision of estimates made from sampling, and the various purposes for which fishery-dependent observations are made (i.e., catch accounting, stock assessment, protected species management, etc.) We understand that WCGOP may be working on such an analysis but

it will not be ready until later this year or next year. The specifics of such an analysis would be very helpful for understanding how EM and observers would fit together.

The Different Levels of Catch Accounting

Again, we see the primary purpose of EM as accounting for catch. In our discussions, we found it useful to keep in mind that there are two different levels of catch accounting involved: (1) estimates of total annual catch, and (2) accounting to create individual accountability in the individual fishing quota (IFQ) and co-op fisheries. Individual accountability requires a higher level of monitoring, but ultimately it is meant to keep total annual catch to the Council's preferred sector allocations and annual catch limits. There is some concern about how EM might reduce individual accountability. However, for some species we would argue that individual accountability may not be needed to adequately control catch. When considering risk, we attempt to be specific about whether we are referring to individual accountability or to the more general matter of accounting for total fishery removals.

Of note, Pacific halibut presents another layer to individual accountability. The halibut Individual Bycatch Quota (IBQ) system is meant to improve the survivability of the fish by giving fishery participants individualized estimates of discard mortality.

Thinking About Risks and Incentives Generally

Some GMT members were able to attend the National EM Workshop this past January in Seattle. Many of the discussions were very informative. One that stood out was a talk given by Rick Stanley on his experience with the design of EM systems in British Columbia.[1] He indicated that they spent considerable time, including holding meetings over several years (perhaps before and after EM had already been implemented), considering how people might "game the system" and figuring out how to plug the holes that were identified. He referred to it as "means, motives, and opportunity" for evading the EM system. He also emphasized the importance of having these conversations with the fishery participants because they best know which behaviors to be realistically concerned about.

We would recommend conducting a similar exercise here to best understand and compare and contrast the risks of optional program designs. The "means, motives, and opportunities" would be different by vessel type and sector and even species and possibly area. We would like to emphasize that the GMT does not mean to take an overly cynical view of how fishery participants would behave under an EM system. Most participants would likely act responsibly. Nonetheless, knowing how a system might realistically be exploited is valuable to understanding risks. We believe that there is widespread interest in ensuring the integrity and fairness of the monitoring system.

Retention Definitions

As a small matter, some on the team question the use of the term "optimum." The plain and technical meanings of that word are different than what is meant by the proposal. The proposal is

[1] The talk may be viewed here: http://www.eminformation.com/presentation/plenary-session-3. The remarks referred to can be heard at approximately the 7:20 mark on the video.

in essence to simply allow more species to be discarded. We think the focus would best be turned toward the factors that make discards acceptable or not, which is a species by species determination based on some of the risks we lay out here (e.g., the precision and accuracy of discard estimates, the effect on individual accountability, and at the higher level, how the error in discard estimates affect the risk of exceeding an Annual Catch Limit (ACL) and ability to estimate stock status with assessments). As discussed below, this would involve species by species consideration along the lines of the "Discard Species List" option.

Coverage Levels

The EM alternatives are focused on retention-based programs where discards are limited. These programs basically work by either: (1) disallowing discard with compliance measures focused on detecting illegal discards, (2) incentivizing accurate reporting, or (3) some combination of these. In short, there are various ways of designing programs but the problem of proof is focused on the question of how well fish tickets will reflect what was caught in total.

We had some confusion about matters of coverage level and video review. In other words, what would a 10 percent coverage or review level be a percentage of? We have heard coverage spoken about in terms of the number of tows or sets made on a trip. We can see how that would be appropriate in a system where it is possible to see which fish came aboard and then confirm with reasonable confidence that it was recorded on a fish ticket or in a logbook. The sampling logic would be that the accuracy of logbooks or fish tickets could be incentivized by the prospects of getting caught intentionally or unintentionally making inaccurate entries. Such systems depend on being able to determine how accurately logbooks or fish tickets record total catch.

When discards are of concern, the sampling problem becomes a bit different. Using the concepts of sampling theory, the ideal is to use a "sampling frame" that when sampled from, gives every unit in the total "population/universe" of possible events an equal chance of being sampled. If EM is meant to ensure compliance with retention requirements, then the "universe" of possible events to sample from is the total time in which there are means and opportunity to discard, or from the time the fish is caught to the time the catch is confirmed reported on a fish ticket.

The main point we emphasize here is that we are unsure how to think about risks and coverage levels without more specifics on how the EM programs would function.

Comparative Risks of Observers and EM

We have heard arguments, both within team discussions and elsewhere, that EM should not be held to a higher standard than observers. Observers can certainly be fooled, may make errors in their estimates, be forced to basket sample and provide expanded estimates, or may not be able to sample all hauls during a trip. We would recommend giving attention to the holes in monitoring, whatever the program design, in a risk-based manner. No program will be perfect, but it would be preferable to be aware of what the holes in the monitoring might be, and how they might affect the accuracy of catch estimates, individual accountability, etc.

We do not mean to prompt discussion of whether observers or EM are superior to one another. There are trade-offs involved with each. However, the comparison is being made in the analysis given the standard protocol of comparing action alternatives against status quo/no action. Where comparisons are made, we would again point to the concepts of sampling theory. For instance, an observer might be thought of as a mobile "sampling frame", that while not looking all the time, may be looking when not expected. In other words, 100 percent observer coverage does not mean the observer will detect every event of interest. A camera based system may be more fixed, but again, it depends on the design. Likewise, observers have protocols for knowing when fish come onboard that make it more likely the fish would be missed if discarded surreptitiously. These are just examples of what the analysis might look to when comparing and contrasting alternatives.

Lastly, we would like to express concern about statements that there are consistent ways of fooling observers. These statements are usually made, again, to argue that EM should not be expected to be perfect either, and we have not seen direct evidence of consistent cheating in the IFQ and co-op programs. Nonetheless, those of us that are concerned are concerned enough to recommend that the Council also look at observer protocols and how they may or may not be changed so as to reduce the chances of bias in catch accounting and holes in individual accountability.

The fish "in the water" problem - Controllability

A lot of attention seems focused on the problem of estimating the species and weight of fish that are caught but not seen onboard, for instance, when fish are "bled" from the net intentionally or come loose unintentionally when bringing gear aboard. Arguments are made about how significant the amount of fish might be, and in many cases, it seems that the amounts are relatively low. Yet taking a risk-based view, we would recommend focusing on how controllable certain behaviors are, or in other words, focus on the means and opportunity for "gaming the system." If the activity is not controllable, then it is unlikely to affect the incentives of individual accountability. If individual accountability might be affected, then the Council may wish to address them with the program design.

Species and Areas

The level of precision and accuracy needed for catch accounting and compliance may depend on the species, who the interested end-user of the information is (i.e., fisherman, stock assessor, manager, or enforcement), and by the question that we are trying to answer (see above). Questions regarding the necessary level of precision/accuracy may be considered by fishermen for their individual catch accounting needs, by management for ensuring individual accountability and catch remains below the ACL, and by stock assessors for their assessments. If discarding certain species is of importance to a sector (e.g., undersized English sole), then the risk of using EM to estimate those discards would ideally be evaluated by each end-user group of the information.

One question we discussed was along the lines of "how significant would the impact be if the discard estimate provided by EM was wrong (i.e., different from the "true" value)?" For example, the impact of being wrong, whether for compliance or for discard weight estimates, may be much lower for species that are typically caught in quantities far below the trawl allocation and the ACL (e.g., English sole) and are easily identified and discernible from all other species. On the other

hand, there are species for which attainment is high, annual fishing mortality is near the ACL, and/or identification may be difficult (e.g., rougheye rockfish, petrale sole, and overfished species). For these types of species, fishermen, management, stock assessors, and enforcement may require a much higher level of precision and accuracy, because the impacts of being wrong may be much greater than for species such as English sole.

The risks and incentives at play with EM are likely to be by area as well. Using the extreme example of yelloweye rockfish, some areas will have higher probability of encountering yelloweye than others. These matters could be looked at with existing observer data. We understand that WCGOP is preparing analysis that would help understand these probabilities better.

An example of individual accountability and ACL management

We provide the following example for perspective on team discussions about EM and concerns of individual accountability. Evaluating the risk of potential impacts of allowing discard can be made on a species-by-species basis. The example uses English sole because one EFP proposes allowing two bottom trawl vessels to discard English sole (Agenda Item F.5.a, Attachment 2, June 2014).

The 2015 ACL for English sole is 11,040 mt; (see Agenda Item F.7.a, Attachment 2). The 2014 IFQ allocation is approximately 5,260.9 mt. The average attainment of English sole for the IFQ fishery 2011-2013 was 2 percent of the IFQ fishery allocation (see Agenda Item F.4.b, Supplemental NMFS Report, June 2014). If the assumption is made that 10 trawl vessels may participate in EM, then approximately 15 percent of the trawl IFQ fleet would be monitored using EM whereas the remaining portion of the fleet (85 percent) would opt for status quo observations (i.e., 68 vessels fished IFQ trawl during 2013; see Agenda Item F.4.b, Supplemental NMFS Report, June 2014). In this case, we might project that the "true" discard of English sole by vessels using EM may be approximately: (5,261 mt trawl allocation) x (2 percent attainment) x (17.8 percent discard) x (15 percent of vessels) = 2.8 mt, or 0.28 mt per vessel. The "true" discard of English sole in this example would represent 0.025 percent of the ACL (= 2.8 mt / 11,040 mt). If for some reason, estimated discard from EM was one-half the true value, then the error would be 0.0125 percent of the ACL, or 1.4 mt for the 10 vessels combined (= 0.14 mt per vessel).

These types of calculations could be helpful for considering the potential cost of being wrong if EM is not as precise or accurate as human observers.

Economic Connections Between Observers and EM

We have heard about the concerns an EM program might have for the economics of observer providers, catch monitors in small ports, and more. We see these as very important questions that should be looked at in as much detail as possible to avoid unintended consequences to fishing communities and to the monitoring capabilities across all sectors.

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