

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON AMENDMENT 20: TRAWL RATIONALIZATION ALTERNATIVES

The Scientific and Statistical Committee (SSC) heard from Mr. Jim Seger (Council Staff) regarding the Council's preliminary decision points for the current meeting, and the timeline for completing the Draft Environmental Impact Statement (DEIS) for public review and reporting on progress to Congress. The SSC also received a presentation from Dr. Steve Freese (National Marine Fisheries Service [NMFS] Northwest Region) regarding a preliminary analysis of costs associated with the Trawl Individual Quota Program (TIQ) for data collection, monitoring, enforcement and administration under the status quo and two program alternatives.

The SSC Economics and Groundfish Subcommittees met with the Trawl Individual Quota Analytical Team (TIQAT) on May 28-29, 2008 to review the Preliminary DEIS materials prepared for the Council's June meeting (Agenda Item F.6.b). The full report of that meeting is attached. Below are highlights from the report and some additional comments.

The TIQAT has made significant progress in developing documentation and supporting analyses for the TIQ program alternatives. The Council has to make a complex set of inter-related decisions to implement the TIQ program. Their task and public review of the proposed decisions would be facilitated by documentation that clearly lays out the decisions to be taken and how those decisions relate to the objectives of the program. The SSC subcommittee report suggests changes to the organization and content of the preliminary DEIS as examples of ways to improve the documentation.

The DEIS is supported by several related analyses, with results from one analysis feeding into subsequent analyses. Major analyses pertain to the initial allocation, projections of fleet consolidation and bycatch reduction, and effects on ports.

Initial Allocation

The issue of initial allocation is primarily one of equity and social policy. The gifting of initial quota shares will provide a marketable asset to some individuals and deny it to others. Over the long run, quota shares will tend to gravitate toward the most efficient fishing operations, which will be able to outbid less efficient operations for transfer or lease of quota shares. However, the identities of long term participants in the fishery, their geographic distribution, and the amount of wealth accumulated will, to varying degrees, be influenced by the initial allocation. Further, accumulation limits, grandfather provisions, capital constraints, and personal preferences could have a large effect on the long-term efficiency of the fleet. The adaptive management option could be developed to mitigate short term disruptions.

Fleet Consolidation

The TIQAT used a fleet consolidation model to estimate the size and profitability of the groundfish trawl fleet that may result from the TIQ program. The results from this model will also be an input into the regional economic impact model and will influence the costs of monitoring, data collection, enforcement and administration.

A standard econometric methodology was used to estimate the economic efficiency of individual trawl vessels based on vessel cost and earnings data collected for 2003 and 2004 by the Northwest Fisheries Science Center (NWFSC). Results from the analysis, based on 2004 costs and harvests, indicated considerable consolidation, with the fleet being reduced to 40-60 vessels and with cost savings in the range of \$18-22 million. The cost savings would arise from a shift in fleet composition to vessels with lower costs, which were estimated to fall in the 50-60 foot size range, and a reduction in fixed costs due to the operation of a smaller fleet.

There is considerable uncertainty regarding the results of the fleet consolidation model. The projected size of the profit-maximizing trawl fleet may be too large, as the model assumes a constant mix of target species before and after rationalization. An individual fishing quota (IFQ) fishery may lead to a fleet with more species specialization and thus have fewer vessels than estimated by the model. On the other hand, fleet size may be underestimated, as the model assumes no constraints on accumulation of quota shares. Also, model results were based on 2004 and 2006 harvests, when optimum yields (OYs) were generally low. Projections of profits probably are low relative to the long term because, as stocks rebuild, future catches are likely to be higher than in 2004 and 2006, and costs are likely to be lower due to specialization in groundfish. Model results pertain to the endpoint of an ideally rationalized fleet, and not the transition to this state. Despite these uncertainties, the model results provide a general idea of the profits and fleet size that might be produced by a rationalized groundfish trawl fishery.

Bycatch Reduction

The TIQAT conducted a trawl bycatch reduction analysis to evaluate the likely potential increase in the harvest of target non-whiting groundfish species. The analysis used observed changes in the bycatch rates of canary rockfish in a 2001-2004 exempted fishing permit (EFP) fishery off Washington and applied them in the NMFS/Groundfish Management Team trawl bycatch model to simulate harvests that could be taken under a rationalized trawl fishery.

The EFP fishery indicated large reductions in the bycatch rates of canary rockfish when the participants in that fishery were allowed to operate under conditions similar to a rationalized fishery. It remains unclear whether these reductions are representative of what might occur under other fishing strategies or in other locations. Because the predictions from the bycatch rate reduction model serve as inputs to other analyses supporting the DEIS, it is important to consider a range of bycatch rate reductions that reflect these uncertainties. The TIQAT considered three scenarios – a low catch scenario based on industry input, and medium and high catch scenarios that assume 35 percent and 50 percent reductions in bycatch rate as observed in the EFP fishery during 2003-2004. It is not clear whether these three scenarios adequately bracket the range of uncertainty; however, very little quantitative information exists for projecting potential bycatch rate reductions.

Effects on Ports

A qualitative analysis examined the potential change in fortunes of different geographic regions under a rationalized trawl fishery. Scores for each port were developed based on four criteria: (1) the number of non-whiting trawl vessels delivering to each port associated with efficient versus inefficient size categories, (2) the percent of each port's non-whiting trawl landings associated with lower versus higher bycatch areas, (3) the level of supporting infrastructure in each port, and (4) projected allocation of quota pounds (QPs) to each port based on two initial

allocation scenarios. The results highlight a few ports that appear most likely to be affected by the TIQ program. The criteria used to score each port appear to be suitable and appropriately analyzed.

Other Issues Discussed During the Meeting

Discussions during the meeting raised a number of points that were not specific to any of the focal models or analyses, but which should be given consideration as the DEIS is developed further.

- The DEIS should clearly specify the activities eligible for support under the Adaptive Management provision and the process for administration and distribution of adaptive QP.
- The IFQ alternative includes explicit provisions for catch overages, "repayment" of overages, and sanctions in the event of non-payment. No comparable provisions exist for the Co-op alternative, even though there seems no inherent reason why a co-op would be less likely to exceed its allotment of QP.
- For species that are rarely caught in trawl gear (e.g., cabezon), the cost of maintaining a system for tracking quota shares and quota pounds may well exceed the benefits. However, aggregating these lesser species into an "other fish" category may, over time, have adverse biological side-effects unless they are monitored on a species-specific basis.
- Further elaboration and analyses are needed regarding the option for geographic assignment of quota shares (QS) with a split at 40°10' N. For many stocks there is little information to define a biological basis for spatial divisions.
- The preliminary DEIS needs a more complete analysis of the effects of the alternatives on net national benefits. Such analysis will become more feasible once cost estimates associated with the alternatives become available.

The SSC notes that the preliminary DEIS was lacking several important sections and analyses, including the following:

- The regional input/output model is not yet available to evaluate the potential impacts to the regional economies of TIQ program alternatives.
- The ecosystem model is not yet available to evaluate likely impacts to the environment of TIQ program alternatives.
- The description and analysis of likely community impacts is not yet available.
- With regards to monitoring and administrative cost estimates, the SSC notes that as cost estimates are refined and developed further, care should be taken to ensure that the assumptions regarding modeled impacts are consistent among the various analyses and models.

Review of Preliminary Draft Environmental Impact Statement
on Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery

SSC Economics and Groundfish Subcommittees
28-29 May 2008
Portland, Oregon

Members of the Economics and Groundfish Subcommittees of the SSC met with the Trawl Individual Quota Analytical Team (TIQAT) on 28-29 May 2008 to review materials prepared for the Council's June meeting, when the Council will choose a preliminary preferred alternative for the Trawl Rationalization Program. Materials reviewed included the Preliminary Draft Environmental Impact Statement (DEIS, Agenda Item F.6.b), supporting appendices, and other documents. The subcommittees heard presentations from Jim Seger and Merrick Burden (Council staff), Carl Lian (NWFSC), and Quinn Weninger (Department of Economics, Iowa State University).

The SSC subcommittees commend the TIQAT for making significant progress in developing documentation and supporting analyses for the TIQ program alternatives. The Council has to make a complex set of inter-related decisions to implement the TIQ program. Their task would be facilitated by documentation that clearly lays out the decisions to be taken and how those decisions relate to the objectives of the program. To this end, the SSC subcommittees offer the following suggestions regarding the organization and content of the preliminary DEIS, as examples of ways to improve the documentation.

- The Introduction section of the DEIS should include a "map" and "instructions" to indicate how to use the DEIS. Although the current preliminary DEIS includes a section on the document's organization, there is nothing that clearly indicates how the different chapters relate to each other or how the information in each chapter relates to the task of selecting among the various options for the TIQ program.
- The tables of alternatives in the preliminary DEIS (e.g., Table 2-3, "Full description of the IFQ alternatives") should include explicit linkages to other sections that describe for each alternative (a) what it is intended to achieve and (b) evaluates its effectiveness relative to the stated objectives.
- The unlabelled table on p. 118 in Chapter 4, section 4.2.2 ("Utilization of analytical methods in assessing the effects of the analytical scenarios") should include page numbers or other reference points to show where to find supporting information regarding each data collection / model component. It would also be helpful to include a flowchart or table that shows the linkages between the models and the program objectives.
- The summaries of the effects of the five analytical scenarios provide useful information on the potential impacts (e.g., changes in vessel profits and fleet efficiency), but they do not discuss the degree to which each scenario satisfies the goals and objectives of the program.

During the meeting with the TIQAT the SSC subcommittee members found it helpful to work from the table, provided by the TIQAT, entitled "Trawl Rationalization Decision Points" (Agenda Item F.6.a, Attachment 1), which listed the central decision points and summarized the Groundfish Allocation Committee's recommendations by sector. The SSC subcommittee review focused on scientific and technical details in the preliminary DEIS, particularly analyses and

models pertaining to the initial allocation, the effects on fleet consolidation, and the potential for bycatch reduction.

Initial Allocation

There are various issues before the Council regarding the initial allocation of quota shares. Discussion at the meeting focused primarily on the issue of initial allocation to processors as well as harvesters. The SSC subcommittee members view this issue as primarily one of equity and social policy. The gifting of initial quota shares will provide a marketable asset to some individuals and deny it to others. Over the long run, quota shares will tend to gravitate toward the most efficient fishing operations, which will be able to outbid less efficient operations for transfer or lease of quota shares. However, the identities of long term participants in the fishery, their geographic distribution, and the amount of wealth they will be able to accumulate will to varying degrees be influenced by the initial allocation. Further, accumulation limits, grandfather provisions, and capital constraints may restrict this movement of quota shares to the most efficient operations. The adaptive management option could be developed to mitigate for short term disruptions.

Fleet Consolidation

One of the major economic benefits to be derived from a fishery rationalization program is the retirement of less efficient fishing operations and the resulting reduction in overcapitalization in the fishery. The TIQAT used a fleet consolidation model developed by Lian, Singh, and Weninger, to estimate the size and profitability of the groundfish trawl fleet that may result from the TIQ program. The results from this model will also be an input into the regional economic impact model.

A standard econometric methodology (stochastic frontier analysis) was used to estimate the economic efficiency of individual trawl vessels based on vessel cost and earnings data collected for 2003 and 2004 by the NWFSC. The data were collected by in-person interviews and seem to be representative of the fleet. Results from the analysis, based on 2004 costs and harvests, indicated considerable consolidation, with the fleet being reduced by 50% to 66% (to 40 to 60 vessels) and with cost savings in the range of \$18 to \$22 million. The cost savings would arise from a shift in fleet composition to vessels with lower costs, which were estimated to fall in the 50 to 60 foot size range, and a reduction in fixed costs due to the operation of a smaller fleet.

There is considerable uncertainty regarding the results of the fleet consolidation model. The SSC subcommittees note that the projected size of the profit-maximizing trawl fleet may be too large, as the model does not account for specialization but instead assumes the same fixed mix of target species (whiting, DTS, non-DTS, crab, shrimp, and other) before and after rationalization. An IFQ fishery may lead to a fleet with more species specialization and thus have fewer vessels than estimated by the model. On the other hand, fleet size may be underestimated, as the model assumes no constraints on accumulation of quota shares. Also, model results were based on 2004 and 2006 harvests, when OYs were generally low. Projections of profits probably are low relative to the long term because, as stocks rebuild, future catches are likely to be higher than in 2004 and 2006, and costs are likely to be lower due to specialization in groundfish. Model results pertain to the endpoint of an ideally rationalized fleet, and are not informative about how the transition to this state will occur. Despite these uncertainties, the model results provide a general idea of the profits and fleet size that might be produced by a rationalized groundfish trawl fishery.

The fleet consolidation analysis should be accompanied by an analysis of alternative fisheries likely to be targeted by vessels displaced from the groundfish fishery that are not retired.

Also, the TIQAT should examine the maximum amount of fleet consolidation that is possible given the allocation limits in each analytical scenario. This will establish a boundary condition on the fewest number of vessels that can prosecute the fishery.

Technical Note

The stochastic frontier model included a linear term for the latitude of each vessel's home port as a mechanism to account for spatial differences in fish abundance and vessel harvesting efficiency. The coefficient for this term was not significantly different from zero. The assumption of a linear trend in fish abundance or harvesting efficiency with latitude may be distorting the results. A more flexible spatial model structure (e.g., a set of dummy variables to represent ports) would provide a better representation of spatial differences in fish abundance, which are likely to vary non-linearly with latitude, and the coefficients would provide information on potential geographic shifts in fleet operations.

Bycatch Reduction

Another major potential economic benefit to be derived from a groundfish trawl rationalization program is the ability to access groundfish stocks that currently are constrained by the bycatch of overfished rockfish species. The TIQAT conducted a trawl bycatch reduction analysis to evaluate the likely potential increase in the harvest of target non-whiting groundfish species. The analysis used observed changes in the bycatch rates of canary rockfish in a 2001-2004 EFP fishery off Washington and applied them in the NMFS/GMT trawl bycatch model to simulate harvests that could be taken under a rationalized trawl fishery. The analysis of the EFP fishery data addressed previous comments made by the SSC Economics Subcommittee in September 2007 regarding possible spurious effects due to changes in the target species in the denominator of the bycatch rate.

The EFP fishery indicated large reductions in the bycatch rates of canary rockfish when the participants in that fishery were allowed to operate under conditions similar to a rationalized fishery. It remains unclear whether these reductions are representative of what might occur under other fishing strategies or in other locations. Because the predictions from the bycatch rate reduction model serve as inputs to other analyses supporting the DEIS (e.g., the fleet consolidation model), it is important to consider a range of bycatch rate reductions that reflect these uncertainties. The TIQAT considered three scenarios – a low catch scenario based on industry input, and medium and high catch scenarios that assume 35% and 50% reductions in bycatch rate as observed in the EFP fishery during 2003-2004 (Appendix C, Table 6). It is not clear whether these three scenarios adequately bracket the range of uncertainty; however, very little quantitative information exists (other than the EFP) for projecting potential bycatch rate reductions.

To the extent that bycatch rates are influenced by the skipper of a vessel (or otherwise are caused by a vessel effect) one could expect that there will be further reductions in bycatch over time as less efficient skippers exit the fishery.

Technical Note

Additional information should be provided in Appendix C to more fully document results from the analyses and how they were derived. For example, Table 5 should include sample sizes and confidence intervals for the bycatch rate estimates. Table 6 (or the accompanying text) should include definitions of the scenarios, and should include a column for the status quo catch.

Other Models / Analyses

The SSC subcommittees also reviewed a qualitative analysis that examined the potential of different geographic regions to be made better or worse off under a rationalized trawl fishery. The analysis involved development of scores for each port based on four criteria: (1) the number of non-whiting trawl vessels delivering to each port associated with efficient versus inefficient size categories (based on results from the fleet consolidation model indicating that 50-60 foot vessels were likely to be most efficient), (2) the percent of each port's non-whiting trawl landings associated with lower versus higher bycatch areas, (3) the level of supporting infrastructure in each port, and (4) projected allocation of quota pounds to each port based on two initial allocation scenarios (catch history only versus equal allocation of buyback history). The results (Appendix C, Table 5) highlight a few ports that appear most likely to be affected by the ITQ program. The criteria used to score each port appear to be suitable and appropriately analyzed.

Other Issues Discussed During the Meeting

Discussions during the meeting raised a number of points that were not specific to any of the focal models or analyses, but which should be given consideration as the DEIS is developed further.

- It will be important to have a mandatory socio-economic data collection program to meet the reporting requirements of an ITQ program and to determine the degree to which the program's goals are being met.
- The preliminary DEIS and supporting analyses start with the assumption that trip limits would be replaced by individual quotas but that other current management measures would remain in place. The Rockfish Conservation Areas (RCA) will constrain the ability of quota holders to fully capture the benefits of the IFQ system. The Council may wish to reconsider the need for the RCA once the effects of rationalization become more apparent.
- The DEIS should clearly specify the activities eligible for support under the Adaptive Management provision and the process for administration and distribution of adaptive QP.
- The IFQ alternative includes explicit provisions for catch overages, "repayment" of overages, and sanctions in the event of non-payment. No comparable provisions exist for the Coop alternative, even though there seems no inherent reason why a coop would be less likely to exceed its allotment of QP.
- For species that are rarely caught in trawl gear (e.g., cabezon), the cost of maintaining a system for tracking quota shares and quota pounds may well exceed the benefits. However, aggregating these lesser species into an "other fish" category may, over time, have adverse biological side-effects unless they are monitored on a species-specific basis.

- The National Standards Guidelines for Annual Catch Limits accountability measures may mandate provisions that will impact the program, both in terms of defining species complexes and carryover of catch overages.
- Further design details and analyses are needed concerning QS that sunsets and is then sold at auction.
- Further elaboration and analyses are needed regarding the option for geographic assignment of QS with a split at 40°10' N. For many stocks there is little information to define a biological basis for spatial divisions.
- The preliminary DEIS needs a more complete analysis of the effects of the alternatives on net national benefits. Such analysis will become more feasible once cost estimates associated with the alternatives become available
- The preliminary DEIS has no analysis of the effects on consumers with regard to product availability and prices.
- The preliminary DEIS does not address how the Council will handle spill-over effects on other sectors from overages by the trawl sector, and vice versa.
- The preliminary DEIS only partially addresses mechanisms for handling QS of an overfished species that becomes rebuilt, or the transition (if any) for QS of species that become assessed as overfished.
- The preliminary DEIS does not address the spill-over of vessels displaced by consolidation and the alternative fisheries that are likely to be affected.
- If under an IFQ system it is advantageous to be in a cooperative, then one would expect this formation of organization to develop. It is unclear why an IFQ program would need to require the formation of coops.
- The TIQ program currently includes no provisions that prohibit individuals from retiring their quota shares. QS that is held but not used seems counter to the goal of full use of potential harvest. However, if the public places higher value on fish existence than on fish products, not using QS could result in increased net national benefits.

The SSC notes that the preliminary DEIS was lacking several important sections and analyses, including the following:

- The regional input/output model is not yet available to evaluate the potential impacts to the regional economies of TIQ program alternatives.
- Monitoring, data collection and management, and enforcement costs are not yet available. The desirability of some of the proposed alternatives may change considerably, once their costs are known.
- The ecosystem model is not yet available to evaluate likely impacts to the environment of TIQ program alternatives.
- The description and analysis of likely community impacts is not yet available.