GROUNDFISH MANAGEMENT TEAM (GMT) AND COUNCIL STAFF REPORT TO THE
GROUNDFISH ALLOCATION COMMITTEE ON FORMULA-BASED USES OF THE
ADAPTIVE MANAGEMENT SET ASIDE

I.   Introduction

This report addresses a request from the Council to the Groundfish Management Team (GMT) for guidance on the design and implementation of an adaptive management program (AMP) made at the April 2009 meeting. The principal question before the Groundfish Allocation Committee (GAC) is whether to pursue a formula-based AMP for years 1 and 2 of the trawl individual fishing quota (IFQ or TIQ) program or to postpone implementation until year 3.

A. Brief Summary of the Council's Consideration

In November 2008 the Council recommended converting management of the shoreside whiting and non-whiting bottom trawl fisheries to a combined IFQ program. The Council's November 2008 motion on the matter also included the following language:

> It is the intent of the Council to have an adaptive management program for the shoreside non-whiting sector. . . Further details will be developed through a trailing action with the

intent of having the adaptive management provisions apply during the first year of implementation of the trawl rationalization program.[1]

At the GAC meeting in January 2009, the National Marine Fisheries Service (NMFS) informed the GAC that the agency did not believe it was possible or necessary to complete the trailing action in time for the start of the TIQ program. During the Council's consideration of the issue in April, NMFS reiterated concerns about the potential administrative complexity of the AMP and offered a motion to allocate the 10% set-aside to permit holders pro-rata to the allocation of quota share (QS) for the first two years of the program. In effect, this "pass-through" approach would allocate 100% of the quota pounds (QP) in both years 1 and 2 of the TIQ fishery based on QS holdings. The AMP would then switch to a formula-based program in year 3.

The Council amended the NMFS motion to add an AMP option for the first 2 years of the TIQ fishery and requested that the GMT and Council staff identify formulaic approaches to address the various objectives of the AMP for consideration by the GAC and its advisors at this meeting.

B. Brief Background on the Adaptive Management Program

The Council's groundfish IFQ program is essentially a "cap and trade" program designed to create individual accountability for total catch and improve harvesting efficiency in the shoreside non-whiting and whiting trawl fisheries. At the same time, these improvements will come with tradeoffs to some of the Council's other management objectives. In particular, the Trawl Rationalization DEIS estimates that the non-whiting fleet will consolidate from 100-120 vessels participating annually down to 40-60 vessels. This, in turn, may cause geographic shifts in landings and adverse impacts to some businesses and fishing communities with historical participation in the fishery.[2]

The Council has long recognized these potential tradeoffs and has been considering the AMP as a major tool for addressing those tradeoffs. In November 2008 the Council recommended setting aside up to 10% of the QS for use in the AMP. The AMP goals and objectives specified in the Council's April 2009 motion include:

- Community stability
- Processor stability
- Conservation
- Unintended/unforeseen consequences of the TIQ program

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[1] November 2008 Briefing Book, Agenda Item F.3.i, Supplemental WDFW Motion Package 1 (As Amended) (www.pcouncil.org/bb/2008/bb1108.html).

[2] *See, e.g.,* sec. 4.6.2.1 (p. 304) and sec. 4.9.2.2 (p. 410) \in Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery; Preliminary Draft Environmental Impact Statement, October 2008 ("Trawl Rationalization DEIS or Decision Document") (www.pcouncil.org/groundfish/gffmp/gfa20/gfa20decdoc.html).

- Facilitate new entrants (both processors and harvesters).[3]

The Council also recognizes that the objectives for the AMP could differ regionally because of different local priorities and impacts of the TIQ program. For this reason the Council's November 2008 motion envisioned that the AMP would be run through "separate, but parallel processes in each of the three states."

II. General Policy Considerations for Year 1 of the TIQ program

A. Formula-Based Adaptive Management – Year 1 or Year 3?

The April 2009 GMT statement highlighted a basic difference between proactive and reactive approaches to the AMP. Given that the fundamental policy decision before the GAC is a question of when to apply a formula-based approach—that is in year 1 or year 3 of the TIQ program—the policy considerations appear different. The GMT did not spend much time discussing and framing the issue; yet in essence, those advocating waiting until year 3 might believe that there is not much cost in waiting, or alternatively, some unacceptable cost to implementing the AMP in year 1 (e.g., a potential delay in implementation of the full TIQ program). In contrast, those advocating implementing AMP in year 1 might believe that there could be considerable cost to not acting in year 1, and perhaps at the same time, not much benefit to waiting to year 3 if there isn't much more to be learned (by year 2) that would aid in the design of a formula option.

Either way, the question of which formula-based approaches could be implemented, and what it would take to implement them, is a fundamental consideration. To address the Council's request, we focused on identifying formula-based options that could be employed without (i) requiring extensive Council consideration, or, (ii) creating burdensome implementation tasks, and (iii) extra tracking and monitoring requirements for NMFS. For each formula discussed below, we attempted to explicitly address these three factors by identifying Council decision points, NMFS implementation steps, and tracking and monitoring needs.

Lastly, we made an effort to identify a formula-based approach for each of the AMP objectives identified in the Council's motion. In doing so, we relied heavily on ideas offered through public testimony, including comments presented by the Environmental Defense Fund on a series of stakeholder workshops they held on design of the AMP.[4] Although we considered and treated each objective in isolation, the Council could attempt to address multiple objectives at the same time by designating sub-pools of AMP quota that would apply to the objective-specific formulas.

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[3] For more discussion of the different AMP objectives, *see* April 2009 Briefing Book, Agenda Item F.5.b, Supplemental GMT Report (http://www.pcouncil.org/bb/2009/bb0409.html).

[4] See Agenda Item F.5.c, Supplemental Public Comment 2, April 2009 (http://www.pcouncil.org/bb/2009/0409/F5c_SUP_PC2_0409.pdf).

B. Year 1 Allocation Method

With the exception of the processor stability formula, the formula-based AMP options described below would still involve a non-targeted allocation of the AMP quota set aside in year 1 of the TIQ program. The GMT discussed an alternative year 1 allocation approach involving equal sharing of the AMP QP rather than an apportionment pro-rata to QS holdings as per the Council's April motion. In short, this approach would divide the AMP equally among the set of permits that met criteria designed to target non-whiting vessels (e.g., all permits that made at least one non-whiting landing during the 2006-2008 window period).[5]

This equal sharing approach would involve an extra calculation for NMFS at initial allocation. The major benefit potentially offsetting this extra workload would be that smaller operators (i.e., those receiving less initial allocation) would receive more QP than under the pro-rata approach. In addition, if the Council were to adopt one of the formulas that allocate AMP QP in year 2 of the TIQ program based on vessel behavior in year 1, the equal sharing allocation would mean that all participants start from the same AMP QP "baseline." The following table uses a 2010 sablefish (N. of 36° N. latitude) trawl allocation of 3,500 mt to illustrate the difference for three hypothetical permit holders if 100 permits were eligible for equal sharing of the AMP QP.

Table 1. Comparison of Year 1 Allocation of AMP Quota Between Pro-Rata Pass-Through and Equal Sharing Approach.

Vessel	Sablefish (N. of 36° N. lat.) QS allocation	Year 1 QP	Pro Rata AMP QP	Total under Pro Rata	Equal Sharing AMP QP	Total under Equal Sharing	Difference
A	0.040	277,780	30,864	308,644	7,716	285,496	92.5%
B	0.017	118,056	13,117	131,174	7,716	125,772	95.8%
C	0.005	34,722	3,858	38,581	7,716	42,439	110.0%

Note: Based on a hypothetical scenario involving a sablefish (N. of 36° N. lat.) trawl allocation of 3,500 mt and a total of 100 permits qualifying for equal sharing of AMP quota.

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[5] In contrast, the equal sharing of buyback history for the initial allocation of QS goes to all permits that pay the buyback tax, which includes the shoreside and mothership sector whiting vessels.

C. Data Sources Available for Alternative Formula-Based Approaches

Since the TIQ tracking and monitoring systems have yet to be designed, it is difficult to know which data sources will be readily available to management at the start of the program. However, the program will continue to have fish tickets and logbooks and will involve increased observer coverage. NMFS will also track QP and QS holdings. From these types of data sources we could track the following:

- Disposition, date, location, and quantity of catch and landings made by a vessel;
- Disposition, date, location, and quantity of purchases made by a buyer;
- Gear type used in prosecuting trawl fishing activities;
- Hours spent fishing; and
- QS and QPs held by entities and vessels over time.

III. Community Stability Formulas

In short, concerns over community stability center on worries regarding fishing communities losing landings and vessels through fleet consolidation. The two formulas described in this section seek to address these concerns by providing vessels with an incentive to continue delivering to their principal ports or to deliver to ports most at risk of losing landings in the first years of the TIQ program.

A. Principal Port Formula

1. Basic Objective

The goal of this formula would be to reduce the potential shift in delivery activity in years 1 and 2 by providing an incentive for harvesters to continue delivering to their "principal port."

2. Outline of Design Elements

A vessel's principal port would be defined by where it made its largest overall tonnage of landings in a year or window period prior to the start of the TIQ program. In year 1 of the program, NMFS would pass-through the AMP quota pro rata to QS or use an equal sharing approach. The year 2 allocation would be based on vessel activity in year 1, thereby providing the incentive from the start of the beginning of the program. In other words, if a vessel's principal port in year 1 is the same as the principal port in the baseline year or window period, then the vessel receives AMP quota in year 2.

The amount of AMP QP the vessel would receive in year 2 of the program would be either: (a) pro-rata to their percentage of coastwide landings in year 1, or, (b) pro-rata to their used and unused QP at the end of year 1, depending on which method is easier to calculate. If a vessel's principal port in year 1 differs from the principal port in the baseline year or window period, then the vessel receives no AMP quota in year 2.

3. Council Decisions Required for Implementation

The Council would need to determine the year or window period in which to define vessels' principal ports. The GMT discussed two time periods for establishing a principal port. One is to use 2010 as the base year for establishing principal ports. If a vessel were to stay with the same principal port in 2011 (the first year of trawl rationalization), then that vessel would receive AMP quota in year two of the trawl rationalization program.

The second option was to use 2004 through 2008 as the time period identifying a vessel's principal port. Using a time period prior to 2009 would prevent speculative movement by a vessel to a different principal port. In other words, if vessel operators know that they will receive AMP quota based on their principal port in 2010, the geographic shifts associated with rationalization might occur prior to the implementation of the rationalization program. However, if a principal port is defined by activity from 2004 to 2008, AMP quota would be awarded based on activities that clearly occur prior to the effect of rationalization.

4. Required Implementation Steps

For year 1, NMFS would only need to pass-through the AMP QP based on a pro rata or equal sharing approach. However, the formula would need to be in regulation by the start of the TIQ program so that vessels would know which port NMFS identified as their principal port.

For year 2, NMFS would need to calculate the set of eligible vessels (i.e., those that maintained their principal port) at the end of the year and then distribute the AMP quota pro-rata sometime during the second fishing year. NMFS doesn't need to allocate the AMP QP on Day 1 of the second year as long as the QP is made available early enough in the year to be useful in a vessel's annual fishing strategy. Allowing some extra time for NMFS to determine eligibility and make the QP distributions should make this year 2 implementation more feasible.

5. Required Data Elements

A vessel's principal port could easily be determined from fish ticket records.

6. Other issues

This same approach could also be taken focusing instead on a vessel's "principal buyer" or "principal port-buyer" combination.[6] The approach focuses on maintaining current vessel relationships and so would not have a beneficial impact for communities where current relationships are insufficient. Some communities have been disadvantaged by status quo management and will be in need of new vessels and landings.

B. At-Risk Ports Formula

1. Basic Objective

The goal of this formula would be to provide an incentive for vessels to land their catch in communities that the Council believes to be at risk of losing significant landings during the early years of the TIQ program.

2. Outline of Design Elements

The Council would establish the incentive by identifying a set of eligible ports or landing regions and then creating AMP quota pools specific to each. The following two tables illustrate this for a hypothetical set of ports/regions and of target species QP and bycatch QP. The percentages in the tables refer to percentages of the total AMP set-aside (which is up to 10% of the total trawl allocation). If the Council chose to set aside the full 10% of sablefish AMP quota, then, in the Table 2 example, they would assign 15% of that 10% (or 1.5% of the total) to all ports/regions except CA Port/Region #3, (which is assigned 1% of the total sablefish QP).

Table 2. Hypothetical Port/Region-Specific Target Species Quota Pools (rows add to 100%; percentages refer to apportionments of the 10% AMP set-aside).

	N. WA	S. WA	OR Port/ Region #1	OR Port/ Region #2	CA Port/ Region #1	CA Port/ Region #2	CA Port/ Region #3
Sablefish	15%	15%	15%	15%	15%	15%	10%
Petrale sole	15%	15%	15%	15%	15%	15%	10%
Dover sole	15%	15%	15%	15%	15%	15%	10%
Shortspine	0%	15%	25%	15%	15%	20%	10%
Longspine	0%	15%	25%	15%	15%	20%	10%
Lingcod	15%	15%	15%	15%	15%	15%	10%
English sole	0%	20%	15%	20%	15%	20%	10%
Pacific cod	100%	0%	0%	0%	0%	0%	0%
Arrowtooth	50%	25%	15%	10%	0%	0%	0%

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[6] Buyer codes combine abbreviations for company name and port where the buying activity occurred. Therefore, it should be relatively easy to identify unique port-buyer combinations.

Table 3. Hypothetical Port/Region-Specific Bycatch Species Quota Pools (rows add to 100%; percentages refer to apportionments of the 10% AMP set-aside).

	N. WA	S. WA	OR Port/ Region #1	OR Port/ Region #2	CA Port/ Region #1	CA Port/ Region #2	CA Port/ Region #3
Canary	30%	15%	15%	25%	15%	--	--
Darkblotched	15%	25%	25%	25%	10%	0%	0%
Widow	20%	15%	20%	15%	10%	10%	10%
POP	30%	20%	20%	20%	10%	0%	0%
Halibut IBQ	30%	20%	20%	15%	10%	5%	0%
Yelloweye	35%	10%	10%	35%	5%	5%	0%
Bocaccio	--	--	--	--	--	--	100%
Cowcod	--	--	--	--	--	75%	25%

In this example, the coastwide target species (e.g., Dover sole, petrale sole, and sablefish) are distributed more or less evenly between the three states. Species with a more limited distribution (e.g., Pacific cod) are matched to the port/region in which they occur. Likewise, the bycatch species' quota pools are matched to ports/regions located near high bycatch areas for particular overfished species (e.g., Northern WA and yelloweye rockfish).

With the separate quota pools established, vessels that landed into those ports/regions would become eligible for AMP quota from the pool in year 2. The quota could be distributed to vessels pro rata based on their landings into the port/region at the end of the year, or on a per-landing basis (e.g., for every 1,000 lbs landed a vessel receives 100 lb of AMP QP). In other words, under either method, the year 2 AMP quota allocation would be based on landings activity in year 1. It would also be possible to structure the program around an inseason release of the AMP QP (i.e., late in year 1, based on vessel activity earlier in the year.

3. Council Decisions Required for Implementation

The Council would need to create tables like the ones shown above. Thus the formula would require more consideration by the Council than the Principal Port formula and would involve some equitable division of the AMP set-aside between the states. At the same time, the approach would provide more flexibility to target AMP QP for ports/regions the Council believes to be most at risk of losing landings during the transition to the IFQ program. This approach would also provide flexibility for the states to differ in how they establish an incentive. For example, one state could target AMP quota to a single port or region. On the other side of the spectrum, another state, not wishing to treat its ports differently, could establish a single statewide quota pool.

4. Required Implementation Steps

For year 1, NMFS would pass-through the AMP quota based on the pro rata or equal sharing approach. The agency would also need to publish the rules, including defining the at-risk

ports/regions and establishing the specific quota pool tables, no later than early in year 1 of the TIQ program so that vessels are aware of how AMP quota will be distributed in year 2.

For year 2, NMFS would allocate the AMP quota based on the pro-rata or per-landing basis to qualifying vessels.

5. <u>Required Data Elements</u>

The formula could be based on fish ticket data identifying port of landing and total pounds landed. To establish the port/region specific quota pools, the Council could use landings, logbook, and observer data, much of which is already available in the Trawl Rationalization DEIS.

6. <u>Other issues</u>

In contrast to the Principal Port formula, this approach does not depend on maintaining past vessel-port or vessel-buyer relationships. Instead, it is focused on providing vessels with an incentive to land into the ports or regions that are most at risk of losing landings. The approach would thus hinge on the Council's confidence in being able to single out certain ports for this differential treatment (and, alternatively, confidence that some ports would be stable enough in the first two years of the program to exclude them from eligibility). The Trawl Rationalization DEIS does include analysis that could be helpful in this determination. In particular, the DEIS analyzes initial conditions in trawl communities to determine which ports are likely to benefit from rationalization and those that are most at risk. These factors include port infrastructure, efficiency of the existing fleet, amount of initial quota allocation expected to go to that port's fleet, and bycatch rates in the port's fishing grounds.[7] Aligning the AMP quota pools to the most at-risk ports would help mitigate the risk of losing trawl fishing activities in these ports.

This approach seems especially well suited to providing some assistance to ports located near high bycatch areas. Vessels fishing from ports near high bycatch areas may have a more difficult time adjusting to the IFQ program and may be more likely to sell out of the fishery. New vessels may be unwilling to fish from the port because of the risk and potentially high price for bycatch QP. Targeting the AMP bycatch QP to these ports might provide existing vessels with more opportunity to adjust to the IFQ program and also offset some of that risk for new vessels.

IV. **Processor Stability Formula[8]**

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[7] *See*, *e.g.*, sec.4.14.5 (p. 503) of the Trawl Rationalization DEIS.
[8] This section only concerns shoreside processors of groundfish. At-sea processors' concerns were already addressed in the harvest cooperative arrangement made for the at-sea whiting sectors in the trawl rationalization program.

The processor stability objective can be distinguished from the community stability objective in that processor stability is focused on individual business entities. The question of whether to allocate harvesting quota to processors was a major issue during development of the TIQ alternatives. One argument processors made during the debate was that QS would provide them with stability, certainty, and leverage to build relationships with harvesters under the new management regime.[9] The Council chose to allocate 20% of the whiting QS to processors, yet allocated them no non-whiting QS. Some Council members indicated that they would look to the AMP as a tool for addressing processor concerns about the transition to the TIQ fishery.

A. Processing History Formula

1. Basic Objective

This formula would allocate AMP QP directly to processors (defined as the first receiver on a fish ticket) with the goal of providing existing businesses some leverage to negotiate exvessel prices and other delivery conditions with vessels and QS holders.

2. Outline of Design Elements

The allocation formula in year 1 of the TIQ program would be based on a window period (e.g., 2004-2008), with AMP quota allocated pro rata for each IFQ species management unit based on the processor's fraction of coastwide purchases of each species.

The Council could use the same window period to allocate AMP QP in year 2 or transition to a running average of the preceding 3-5 years of processing activity.[10] The running average could easily be extended to year 3 and beyond. A longer running average time period would dampen the immediate effect of shifts in delivery patterns among buyers/processors. For example, should a vessel move to another processor, the original processor would continue to receive a comparable fraction of the AMP quota pounds for several years based on that vessel's landings pattern. This might provide incentive for the vessel to remain with the original processor because that vessel may lose access to the AMP quota if it chooses to leave. A shorter timeframe would better accommodate shifts in the fishery and new entrants into the processing sector while still providing processors with the bargaining advantages provided by the AMP QP.

3. Council Decisions Required for Implementation

For year 1 of the program, the Council would need to identify the allocation formula window period. For year 2, the Council would need to decide whether to use the same window period or

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[9] For more detailed discussion of the issue, *see* sec. A-2.1.1.a (p. A-48) of the Trawl Rationalization DEIS.
[10] The GMT did not spend much time discussing the optimal time period, yet a range of 3-5 years was suggested during public comment.

to switch to a running average. As mentioned above, this formula could be easily extended past year 2 of the program by employing the running average approach.

4. Required Implementation Steps

In year 1, NMFS would need to allocate the AMP quota based on the window period formula, much like the agency will be doing for the whiting QS. The formula's window period might change to a running average yet the implementation steps would be the same in year 2 and beyond.

5. Required Data Elements

This formula would not be data intensive. The first receiver and total pounds on the fish ticket would be enough to determine processors' AMP quota.

6. Other issues

To ease tracking, the AMP quota allocated under this formula would be completely transferable with no restrictions placed upon those entities that receive the quota. Moreover, given that the purpose of this approach would be to provide assistance to specific businesses, it seems appropriate to permit businesses to use QP in a manner they judge most beneficial to their operations. However, the Council could conceivably choose to place conditions on the use of the QP received through this formula, such as restrictions on the location of landing and a requirement that the QP be used only on non-processor-owned vessels. Such requirements would need some method for tracking compliance.

V.   Methods for Addressing Unforeseen or Unintended Consequences, Incentivizing Enhanced Conservation Objectives, and Facilitating New Entrants

A. Unforeseen/Unintended Consequences

By definition, addressing unforeseen/unintended consequences is not easily accomplished, or perhaps not even possible, through a formula-based approach. If unforeseen/unintended consequences did occur in year 1, the Council could attempt to address the situation with the year 2 allocation of AMP quota. This, of course, would involve tailoring the year 2 AMP quota allocations to the specific harms the Council wished to remedy.

To address unforeseen impacts inseason during year 1, the Council would need to hold back some of the AMP quota and have some capacity to recognize and respond to harm, including a way to evaluate or prioritize competing harms. In the limited time for discussion, we developed two concepts that focused on potential unintended consequences of managing overfished species

in the trawl rationalization program. The GMT discussed the types of overfished species high bycatch events that may cause disruption in the trawl fishery – an unexpectedly high bycatch event that affects an individual, one that affects the sector (shoreside, mothership, catcher-processor), and one that affects all trawl sectors.

Individual

An individual may encounter a high bycatch event and be unable to purchase sufficient quota to cover the overage – either because it is cost prohibitive or because no QP are available on the market. Analyses in the DEIS indicate that OFS QP will be scarce and thus, relative to non-overfished species, more expensive. As the year progresses and OFS QP are used, fewer QP will be available on the market, possibly increasing the price. One unintended consequence of managing OFS within the trawl rationalization program maybe that the price of OFS QP becomes prohibitively expensive for certain individuals due to scarcity or simply because no overfished species QP are available on the market, due to hoarding or that all OFS QP have been used. The GMT discussed how the OFS QP of the AMP could be used to resolve these problems.

The AMP could be structured in a manner that OFS QP could be released into the market on a seasonal basis, in order to provide a year round supply of overfished species QP, which in turn would promote a year round fishery. Only those harvesters with an overage would be eligible to purchase the released OFS QP. Since the OFS QP would be sold in the marketplace, the incentive to avoid the species still remains. Alternatively, the OFS QP could be provided free of charge to harvesters with overages.

In both of the abovementioned scenarios there may be more harvesters with deficits than available QP, thus it would be necessary to further develop qualifying criteria for the OFS QP. One such criterion could be that only those vessel accounts with below average bycatch rates (excluding the high bycatch event that caused the overage) would be eligible for a one time purchase or distribution of the OFS QP. This approach would meet both the community stability goal (i.e., keeping harvesters fishing and delivering) and conservation goals since eligibility is linked to performance.

Sector
With regard to high bycatch events either within the trawl sectors or in the non-trawl sectors, some in the discussion believes that better solutions to these problems exist outside of the AMP. These tools include implementing buffers between the allowable biological catch and the optimal yield (i.e., do not set the ABC = OY), before the non-trawl and trawl sector allocations are made, or prior to the within the trawl sector allocations.

Summary
In summary, these two program options may provide solutions to potential unintended consequences of managing OFS in the trawl rationalization program. However, it is recognized

that if non-overfished AMP QP are distributed without corresponding overfished species QP, that component of the program may be compromised. Therefore, the Council may wish to implement a pass-through for target species in years 1 and 2, while maintaining the OFS AMP.

B. *Conservation Objectives*

Recognizing that conservation encompasses a wide range of objectives, our discussions focused only on two formulas. The first formula would provide an incentive to reduce bycatch of overfished species. The second formula would provide an incentive to reduce gear contact with bottom habitat. Both formulas would allocate AMP QP in year 2 of the TIQ program based on vessel performance in year 1.

4. Providing an Incentive to Reduce Catch of Overfished Species

a) *Basic Objective*

The objective would be to reduce the total catch of overfished species below the trawl sector allocation.

b) *Outline of Design Elements*

This concept would involve rewarding vessels with the largest amount of unused overfished species QP at the end of the year. To apply the formula, NMFS would tally each vessel's unused QP for each overfished species at the end of year 1 and calculate the remaining balance as a percentage of the trawl allocation. NMFS would rank each vessel based on its aggregate unfished percentage and allocate the AMP QP in year 2 pro rata based on this percentage.

Table 4 illustrates this approach for two hypothetical vessels. Vessel A and B have unused QP for overfished species at the end of year 1. When viewed in absolute terms, the amount of unused QP is quite similar between the two vessels. However, when measured against the trawl allocation for those species, the results begin to diverge. Vessel A has a noticeably higher percentage of unused overfished species' quota because Vessel A has higher amounts of unused yelloweye and POP. Unused QP for these two species is inherently weighted more heavily than that for darkblotched because the trawl allocation is smaller.

Table 4. Hypothetical Example of Unused Overfished Species QP Incentive Option.

Vessel ID	Species	Unused QP (mt)	Trawl Allocation	Result (% of trawl allocation)
Vessel A	Darkblotched	8	200	4%
	Yelloweye	.02	0.6	3.33%
	POP	12	180	6.7%
	Result (average)			**4.7%**
Vessel B	Darkblotched	10	200	5%
	Yelloweye	.01	.6	1.7%
	POP	10	180	5.56%
	Result (average)			**4.1%**

c) Council Decisions Required for Implementation

The Council would need to adopt the formula, and perhaps, identify the set of overfished species to which the formula would apply.

d) Required Implementation Steps

Again, the four steps involved in this approach would be:

1. Calculate the amount of unfished quota pounds in each vessel account for each overfished species;
2. Divide these unfished QP amounts by each species' trawl allocation to derive a percent value;
3. Average these percent values for each vessel account; and
4. Allocate AMP quota pounds to vessels pro-rata to their aggregate unfished quota pound percentage.

e) Required Data Elements

The formula would only need the amount of QP remaining in each vessel account at the end of the year.

f) Other issues

The GMT included this formula as an illustration of how a formula-based AMP might possibly address an enhanced conservation objective. The actual conservation benefit of the approach would require more consideration.[11] In addition, some believed that this program might reduce the effectiveness of the TIQ program by potentially decreasing the availability of quota on the market.[12]

The GMT also discussed structuring the incentive in terms of rewarding a reduction in an incidental catch rate. That is, vessels with below average bycatch rates in year 1 would be preferentially awarded AMP QP in year 2. However, unlike rewarding unused overfished QP, rewarding vessels with the lowest incidental catch rate might not actually result in a reduction in overfished species mortality. This is because vessels with below average bycatch rates could transfer QP they do not use to other vessels.

5. <u>Providing an Incentive to Reduce Gear Impacts to Bottom Habitats</u>

a) Basic Objective

To create an incentive for reduced trawl gear bottom contact by rewarding vessels with the fewest tow-hours per pound of IFQ management unit species in year 1.

b) Outline of Design Elements

The formula would use total tow hours for the year and total target species catch for each vessel. A rate for each vessel would be calculated based on total catch divided by total tow hours. This individual vessel rate would be divided by the median rate for all vessels. These values would then be divided by the sum of the values to determine the percentage of AMP quota the vessel would receive. Using the median means that +/-half the vessels should receive some amount of AMP quota. The following table shows some example calculations.

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[11] Some would argue that an incentive to reduce total catch of overfished species below the limits set by the OY/trawl sector allocation could have other conservation benefits, such as more rapid rebuilding of the stock. Yet these benefits may be difficult to measure. To take canary rockfish as an example, even if the Council reduced the OY to 0 mt, the rebuilding analysis predicts that the time to rebuild would only be reduced by 1 year in comparison to the current OY of 105 mt (*see* Table 2-3 in the 2009-2010 groundfish harvest specifications, page 21).

[12] In other words, the AMP incentive would give some value to unused QP in the form of the QP the holder stands to receive in year 2 and possibly increase hoarding, especially with the low abundance species like yelloweye and cowcod.

Table 5. Hypothetical Example of the Reduced Gear Impact AMP Option (Vessel 29 represents the median).

Vessel	lb/hour	% median	% of AMP
Vessel 30	409	146%	7%
Vessel 2	400	143%	7%
Vessel 7	400	143%	7%
Vessel 21	394	141%	7%
Vessel 27	392	140%	7%
Vessel 10	378	135%	6%
Vessel 19	375	134%	6%
Vessel 3	361	129%	6%
Vessel 25	356	127%	6%
Vessel 24	343	123%	6%
Vessel 20	339	121%	6%
Vessel 26	338	121%	6%
Vessel 23	322	115%	5%
Vessel 31	321	115%	5%
Vessel 4	301	108%	5%
Vessel 6	286	102%	5%
Vessel 29	**280**	**100%**	**5%**
Vessel 22	270	96%	exclude
Vessel 5	266	95%	exclude
Vessel 13	256	91%	exclude
Vessel 32	243	87%	exclude
Vessel 9	241	86%	exclude
Vessel 15	232	83%	exclude
Vessel 16	209	75%	exclude
Vessel 14	208	74%	exclude
Vessel 1	193	69%	exclude
Vessel 18	178	64%	exclude
Vessel 28	155	55%	exclude
Vessel 11	152	54%	exclude
Vessel 8	147	53%	exclude
Vessel 17	145	52%	exclude
Vessel 12	140	50%	exclude
Vessel 33	127	45%	exclude

c) Council Decisions Required for Implementation

The Council would only need to adopt the formula and assign a pool of QP to be awarded (i.e., the full 10% AMP set-aside or some lesser amount/subset of species).

d) Required Implementation Steps

For year 1, NMFS would need to establish the incentive in regulation. The allocation of the AMP quota under the formula would occur in year 2.

e) Required Data Elements

This formula would require monitoring of tow hours and total catch, which would presumably be available from the 100 percent observer coverage and landings receipts.

f) Other issues

The conservation benefits from this formula would be based on a presumption that less trawl gear contact with the bottom is beneficial for habitat. Although only half of the vessels could qualify each year, it is assumed that the incentive would increase overall catch per tow hour.

C. Facilitating New Entrants into the Harvesting or Processing Sector

The GMT concluded that facilitating new entry into the fishery would not easily be done via a formula-based approach. One potential method would involve setting aside a pool of quota for crew that did not receive initial allocation of QS and then allocating that pool based on an individual's number of years in the fishery. This would, of course, require some verifiable history of employment or involvement in the fishery. We did not have sufficient time to explore the feasibility of such an approach.

VI. GMT Recommendations to the GAC

1. Consider the suitability of the formulaic options for meeting the Council's adaptive management program objectives.

2. Discuss the pros and cons of implementing an AMP formula in year 1 versus year 3.

3. Give the GMT and Council Staff guidance on any additional analysis for June.