Agenda Item G.4.b
GMT Report
March 2009

# GROUNDFISH MANAGEMENT TEAM (GMT) AND COUNCIL STAFF REPORT ON AMENDMENT 20 – A FRAMEWORK APPROACH FOR SETTING CONTROL AND VESSEL USAGE LIMITS FOR NON-WHITING TARGET SPECIES



## A. Introduction

At its January meeting, the Groundfish Allocation Committee (GAC) asked the GMT to evaluate the four options for setting accumulation limits, and if appropriate, to propose any alternative options that might aid the Council in its final recommendations (Agenda Item G.4.b, GAC Report).

This report summarizes the GMT's analysis of the GAC's recommendations and outlines a suggested framework approach for the Council to use in setting accumulation limits.[1] This report also applies the suggested framework to produce a set of accumulation (Table 4). This set of "GMT Option" accumulation limits is intended only to solicit more meaningful feedback for the Council by illustrating how the team's suggested framework might be applied and for

[1] The GMT developed this approach with significant involvement from Council staff. For the sake of ease, the report will refer to "the GMT" or "the team" throughout the report as has been our convention.

comparison to the existing four options. The GMT is not a policy making body and does not wish to advocate for particular accumulation limits.

Lastly, the framework approach described in this report was developed specifically for the major non-whiting target stocks. In the limited time available for discussion and writing of this report, the GMT could only conclude that accumulation limits for overfished stocks and more minor, potentially non-target stocks (e.g. lingcod) most likely involved additional considerations. The team could discuss those additional considerations and report to the Council at a future Council meeting, if requested.

## B. Overview of the GMT's Suggested Framework

In summary, the GMT's suggested framework involves:

- Setting limits for keystone non-whiting target species first and postponing consideration of overfished and more minor stocks;
- Using exvessel revenues as a primary means of gauging what might constitute an "excessive share" or "inequitable concentration" of quota;
- Focusing on a "one vessel, one owner" scenario to equate control and vessel limits;
- Identifying maximum potential revenues associated with accumulation limits based on regionally important target strategy "bundles" and landings in the fishery (2004-2006);
- Using sablefish and petrale sole, the two key economic target stocks in the non-whiting trawl fishery, as benchmarks to set limits for the remaining target species;
- In general, setting limits for target species higher than what is contemplated by the GAC recommended options to provide for operational flexibility and increases in harvesting efficiency;
- Employing relatively small aggregate groundfish accumulation limits to counter the effect of the relatively higher species limits.

## C. Accumulation Limits – General Policy and Management Objectives

The GMT began its evaluation of the GAC recommended options for setting accumulation limits by reviewing: (1) the general policy considerations in the Magnuson Stevens Fishery Management and Conservation Act ("Magnuson-Stevens Act" or MSA); and, (2) the Council's specific management objectives for setting accumulation limits. This section provides a brief summary of the team's understanding of those considerations and objectives.[2]

### *1. The Magnuson-Stevens Act Mandate*

The MSA provisions on limited access privilege programs (LAPPs) require the Council to:

> ensure that limited access privilege holders do not acquire an *excessive* share of the total limited access privileges in the program by—

[2] *See* Appendix A, sec. A-2.2.3.e of the preliminary Draft Environmental Impact Statement ("Trawl Rationalization Decision Document") for a more thorough treatment of the policy rationales for accumulation limits.

> (i) establishing a maximum share, expressed as a percentage of the total limited access privileges, that a limited access privilege holder is permitted to hold, acquire, or use; and
>
> (ii) establishing any other limitations or measures necessary to prevent an *inequitable concentration* of limited access privileges.[3]

The MSA does not define the terms "excessive share" or "inequitable concentration" or provide the Council with additional criteria to use in "establishing a maximum share … or other limitations or measures." It thus remains up to the Council to determine levels that might be "excessive" or "inequitable" in the particular context of the west coast groundfish trawl fishery.[4]

As articulated in a non-binding NMFS guidance document, the MSA affords the Council broad discretion to define what might be "excessive" or "inequitable" in terms of the overall management objectives for the TIQ program.[5] Antitrust concerns define the upper extreme of where limits can be set, yet accumulation limits are as much a tool for balancing the Council's social objectives against the undesired effects of the TIQ's drive toward increased economic efficiency.

*2. The Council's Specific Management Objectives*

The Council has been contemplating two sets of accumulation limits: (1) control limits; and, (2) vessel usage limits. The two involve separate but related policy rationales.

Under the GAC's recommendation, control limits would apply only to quota share (QS) and would be intended to limit ownership as well as other indirect forms of control. In setting control limits, an important consideration is how much any one entity should be able to profit or otherwise benefit from having the exclusive privilege to harvest a specified portion of the public groundfish resource. Control limits serve two fundamental purposes: (a) they act as preventive measures against anticompetitive market conditions; and, (b) they ensure that the benefits (or "rents") arising from the public fishery resource accrue to a minimum number of QS owners.

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[3] Sec. 303A(c)(5)(D) (16 U.S.C. § 1853a(c)(5)(D)) (emphasis added). *See also* National Standard 4, which requires the allocation of fishing privileges to be "carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges." Sec. 301(a)(4) (16 U.S.C. § 1851(a)(4)).

[4] Looking to the ordinary meaning of the words, the *Merriam-Webster Online Dictionary* (2009) defines *excessive* as "exceeding what is usual, proper, necessary, or normal;" and *inequitable* as "not equitable: unfair." To distinguish *excessive* from its synonyms, *Merriam-Webster* states that it "implies an amount or degree too great to be reasonable or acceptable."

[5] *See* discussion of "market power limits" and "management objective limits" in Part 2.1.F (p. 50-60) of:

> NOAA Fisheries Service – Office of Policy (2007). The Design and Use of Limited Access Privilege Programs. Ed. Lee G. Anderson and Mark C. Holliday. NOAA Technical Memorandum NMFS-F/SPO-86.*

*Agenda Item F.3.d, "Supplemental LAPP Guidelines" in the online version of the Council's November 2008 Briefing Book.

In contrast, vessel usage limits may apply only to the quota pounds (QP) that could be placed in a vessel's account in a given year (regardless of whether the QP is used or not). Vessel usage limits are aimed at ensuring that a minimum number of vessels remain active in the TIQ fishery as a means of preventing unchecked fleet consolidation.[6] The Council has made it clear that optimal harvesting efficiency is not the only goal of the TIQ program and that vessel limits are important tools for promoting the social benefits that result from having a fleet size larger than may be optimal for harvesting efficiency. These social benefits include increased economic activity in coastal communities from increased crew employment and demand for supplies, equipment, and other vessel support infrastructure. A larger fleet size would also be expected to increase the likelihood that landings would remain geographically dispersed.

In setting control and vessel limits, the Council is taking into account the full suite of potentially competing goals, objectives, requirements, and constraints contained in the groundfish fishery management plan (FMP), Amendment 20 (A-20), and the MSA.[7] Some of the more directly related goals and objectives include:

- Provide for a viable, profitable fishery (A-20 Objective 2);
- Minimize adverse effects on fishing communities and other fisheries to the extent practical (A-20 Objective 5);
- Promote measurable economic and employment benefits throughout the seafood industry (A-20 Objective 6);
- Accomplish change with the least disruption of current fishing practices, marketing procedures, and the environment (FMP Objective 14);
- Promote sustained participation of small owner-operated fishing vessels and fishing communities that depend on the fishery (MSA § 303A(c)(5))
- Address concerns over excessive geographic or other consolidation in the harvesting or processing sectors (MSA § 303A(c)(5))

## D. A Revenue-Based Framework for Setting Accumulation Limits

The Council's consideration of accumulation limits to date has focused on landings during different window periods (1994-2003 and 2004-2006) or on the projected initial allocation to permits and to entities. The Council has looked primarily at maximum and the 90$^{th}$ percentile values as a means of gauging the impact of accumulation limits on current fishery participants.

The approach described here is aimed at supplementing the Council's current options for setting accumulation limits. It is offered more as a means of evaluating the current options and

[6] The absolute minimum fleet size associated with a vessel limit can be calculated by dividing the limit into 100 and then adding 1 vessel for any remainder. For example, a vessel limit of 3 percent (100/3) results in an absolute minimum of 34 vessels in the fishery—33 vessels could hold up to the maximum, leaving 1% for an additional vessel.

[7] *See* Table 6-1 in Chapter 6 of the Amendment 20 - Trawl Rationalization DEIS for an accounting of the Council's policy guidance.

providing a complementary perspective to aid the Council in developing its rationale than as a competing option meant to replace all others.

The perspective we take is different from that of the existing options in two major regards. First, we use a vessel-based target strategy approach instead of the species-based 90th percentile values relied upon so far.[8] Second, we attempt to explore the question of what might be an "excessive share" or "inequitable concentration" by looking to the potential revenues possible earned in the TIQ fishery. Ultimately, this perspective is meant to be "forward looking" in nature and aimed at promoting discussion of the tradeoff between economic efficiency and the Council's competing management objectives for accumulation limits.

*1. Accumulation Limits and the Independent Vessel Owner*

In past discussions of accumulation limits, the GMT focused on vessel usage limits because they relate most directly to harvesting activity. The team has shied away from control limits on the belief that they principally involve policy considerations beyond the team's purview.

However, in developing this report the GMT found it useful to discuss the relationship between control and vessel limits. In short, control limits could potentially affect the nature of vessel and quota ownership in the fishery because they ultimately determine whether a single entity, like an owner-operator, will be able to own sufficient QS to operate a vessel independently.

To elaborate, although control limits apply to QS and not QP, they could potentially bar an entity that owns a vessel from controlling enough quota to operate its vessel efficiently. In such a case, the entity will be forced to either: (a) lease QP from another owner quota owner to place on its vessel, or, (b) lease or sell the QP to another vessel to fish. There are several reasons why it may be beneficial for quota owners to fish their quota in partnership with other quota and vessel owners; yet, as we understand the Council's objectives, control limits that require quota holders to find partners in order to operate a profitable venture would be too restrictive.

For the reason described below, the GMT believes this "one vessel, one owner" or "independent vessel owner" scenario can provide the Council with a useful reference point to aid the setting of both control and vessel limits.

*2. Advantages of a Revenue-Based Approach*

With vessel limits, the GMT has encouraged the Council to consider exvessel revenues as a method of judging the fundamental tradeoff between fleet consolidation and improved harvesting efficiency.[9] In brief, if limits are set too low, they might prevent needed gains in overall

[8] The unit of focus for the 90th percentile values analyzed to date are historical catch records on a species by species basis. This means that 90th percentile values are derived from different years and different vessels. It is most likely the case that any combined suite of 90th percentile values would not be representative of any particular fishing operation. The GMT approach instead focuses on the vessel as an operation and variable of interest, and therefore as a more appropriate unit of measurement. We therefore focus on the distribution of species and revenues associated with a vessel in a given year.

[9] PFMC Briefing Book, Agenda Item F.3.f, Supplemental GMT Report, November 2008.

harvesting efficiency. If they are set too high, then the fleet might consolidate more than the Council desires.

To gauge this tradeoff for a given set of vessel usage limits, the Council can use the GMT's suggested approach to compare the absolute minimum fleet size and maximum potential revenues possible by a set of vessel limits.[10]

Fishing behavior is driven by profit, not by poundage. This means that a vessel limit for a low-value species like arrowtooth flounder would likely have a different impact on the fishery than an equivalent percentage limit on a high-value species like sablefish. Profit is also a function of a stock's volume, meaning that species of similar value but different abundance might also warrant different accumulation limits.[11] The GMT's approach is advantageous because revenues offer the Council a method of standardizing across these differences in value and volume.

*3. Applying a Revenue-Based Approach to Control Limits*

The GMT recommends that the Council could also take a revenue-based approach to setting control limits using the "one vessel, one owner" scenario described above. Specifically, the team suggests identifying control limits that would permit a single entity to own QS sufficient to operate a single vessel a chance at generating a reasonable profit in the TIQ fishery.

Given the history of independent "small entity" vessel owners in the fishery, this "one vessel, one owner" approach would establish a reference point at which control limits would most likely not qualify as "excessive." In fact, several objectives in Amendment 20 and the FMP suggest to the GMT that the Council would not wish to set control limits below this level.[12]

However, gaps in economic data combined with uncertain projections about profitability under the TIQ program, mean that the "one vessel, one owner" scenario functions more as a "fuzzy baseline" than a "bright-line" reference point. Nonetheless, by working from this "fuzzy baseline" the Council might be able to distinguish between levels that would reasonably support independent vessel owners and those levels at which control limits become "unnecessary" or "unacceptable" in terms of the maximum potential revenues they make possible or the increased risks they pose to management objectives.[13]

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[10] The *absolute minimum fleet size* and *maximum potential revenue* levels identify the outer boundaries of what a set of limits would make possible (e.g., a floor on fleet size and a ceiling on revenues). However, as discussed below, given the complexity of the fishery, they almost certainly *do not* describe the expected (i.e., most likely) fleet size or average vessel revenues.

[11] For example, there are two stocks of sablefish on the coast divided at 36º N latitude. The trawl OY for the northern stock is considerably higher than for the southern stock. Assuming the exvessel prices are comparable, a given percentage limit will provide for a higher potential profit in the north than in the south.

[12] E.g., "minimize disruption" (FMP Objective 14) and "promote small owner-operated fishing vessels" (§ 303A(c)(5)). *See* section C above.

[13] QS profits are derived from exvessel revenues and profits and so, albeit not identical, they should be proportionately related to the maximum potential revenues identified below.

At the same time, concerns about control go beyond revenues and QS profits to other issues such as bargaining, market power, and types of relationships that may influence the operation of the fishery. In other words, allowing owners to hold an excessive amount of QS not only grants them a large share of profits from the public resource but might also allow them to exert undue influence over other aspects of the fishery. In some cases, control over particular species may equate to influence over the fishery as a whole if those species are highly important to the fishery and have little or no substitutes. Two aspects of substitutability important for considering species-specific control limits include: species with a lack of market substitutes (where only a single species can satisfy a given market demand); and fishery access substitutes (where one species may limit access to other types of species in the fishery). For this reason, substitutability of species in markets and target strategies is another important factor for the Council to consider in setting control limits. An increase in substitutability tends to decrease the likelihood of exerting control and is discussed more specifically below in the context of specific species limits.

*4. Exvessel Revenues – Status Quo vs. TIQ*

The GMT's framework requires the Council to have some sense of what revenues will be necessary and possible in the TIQ fishery. To recap, for control limits, setting the "one vessel, one owner" baseline requires some idea of what revenue would be needed by an independent vessel owner to earn a reasonable profit. For vessel limits, the inquiry is similar but different in that it is focused more on identifying the average vessel revenue needed to achieve the desired increase in the fleet's harvesting efficiency, rather than the revenue necessary for a single, independent entity to remain reasonably profitable.

To help delineate some boundaries, the GMT turned to status quo revenues and the fleet consolidation model in Chapter 4 of the DEIS. Given the lack of economic data and uncertain outcomes of the TIQ fishery, the GMT's estimates can only provide the Council with "fuzzy" targets.

Figure 1 identifies the distribution of annual exvessel revenues earned by vessels in the non-whiting trawl fishery during the 2004-2006 period. This distribution shows that although most vessels generated less than $300,000 per year, some vessels were able to generate more than $600,000.

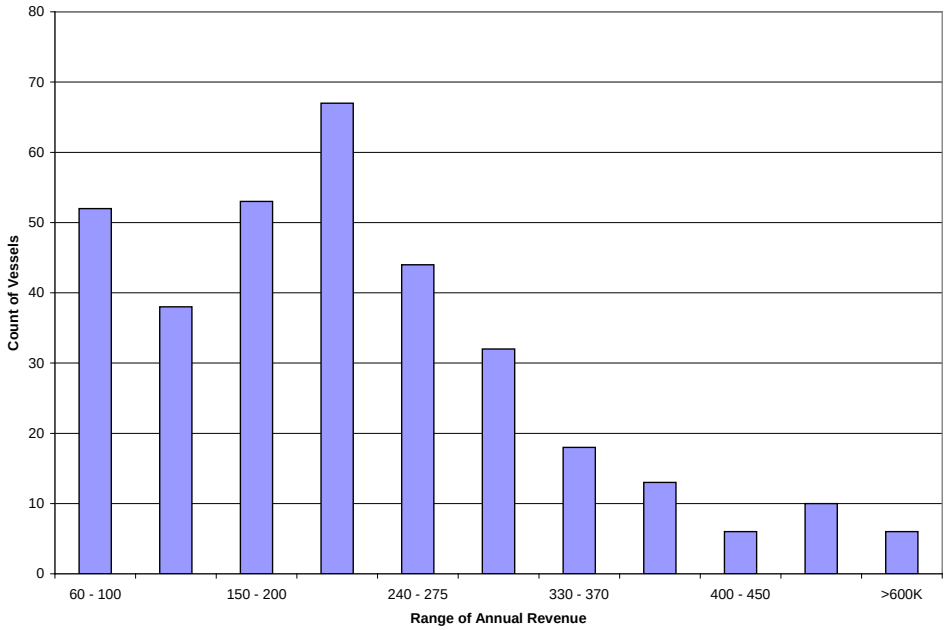


**Figure 1. Count of Vessel-Year Combinations by Annual Revenue Category (2004 - 2006)**

Using this distribution of revenues to make predications about necessary revenues in the TIQ fishery is problematic for several reasons. First, the DEIS suggests that most vessels merely generated enough revenue to cover costs and pay wages without generating an appreciable profit. The GMT does not have the data to identify whether the vessels in the upper ranges of this distribution actually generated reasonable profits. Likewise, because smaller vessels require less revenue, it may be that smaller vessels were able to turn a profit in the mid- or lower- ranges of this distribution. Further complicating the matter is the fact that this distribution includes vessels that spend part of the year fishing in Alaska or other west coast fisheries (e.g., Dungeness crab, pink shrimp, or whiting fisheries). Many vessels are not able, or chose not, to participate in the non-whiting groundfish trawl fishery full time

The modeling work done by Lian, Singh, and Weninger predicts that, had the fishery been rationalized in 2004, approximately 40 full time non-whiting trawl vessels would have been active in the fishery. That fleet of 40 vessels would have been primarily made up of vessels in the 60 to 70 foot in length category as these vessels appear to be the most economically efficient at catching non-whiting groundfish. This analysis indicates that the average vessel would have generated gross revenues on the order of $700,000, compared to a status quo value that is closer to $200,000. This finding is directly related to accumulation limits because the estimated gross revenues and associated profitability are necessary to cover increased monitoring costs. These values were also discussed in the context of three versus four trawl sectors. Advocates of a four sector option maintained that shoreside Pacific whiting vessels would have greater financial capacity than a non-whiting vessel and, should the two shoreside sectors be merged into one, the Pacific whiting vessels would out-bid non-whiting vessels for overfished species quota. The work by Lian, Singh, and Weninger suggests that the revenues generated by non-whiting vessels could become similar to those revenues generated by whiting vessels, putting both non-whiting

and shoreside Pacific whiting vessels on a more equal financial playing field when trading IFQ. This logic appears to have been at least partially responsible for the decision to create a single shoreside trawl sector by merging both shoreside sectors into one. If non-whiting accumulation limits are set at a level that is too restrictive, it might compromise the ability for non-whiting vessel owners to financially compete with Pacific whiting vessel owners over quota.

*5. Combining Maximum Potential Revenues Based on Target Strategies*

As a first step in assessing the effects of existing accumulation limit alternatives, the GMT estimated the potential amount of revenues associated with the GAC 90$^{th}$ percentile options. To make this calculation, the GMT calculated maximum potential revenue using the GAC recommended intersector allocation to the trawl sector, 2010 optimum yields, and average exvessel prices from 2004-2006 (Table 1).

**Table 1. Species limit maximum potential revenues associated with GAC options (see text for assumptions)**

| | GAC ISA Amt (applied to 2010) | Jan-2009 GAC Pref Control Lim Op 1 | GAC Opt 1 Rev | Jan-2009 GAC Pref Control Lim Op 2 | GAC Opt 2 Rev |
|---|---|---|---|---|---|
| Lingcod N | 1,765 | 2.4% | $ 59,755 | 3.0% | $ 74,693 |
| Lingcod S | 277 | 4.3% | $ 16,830 | 8.0% | $ 31,312 |
| P Cod | 1,089 | 6.4% | $ 73,754 | 6.0% | $ 69,144 |
| Sablefish N | 2,689 | 1.0% | $ 72,917 | 1.5% | $ 109,376 |
| Sablefish S | 527 | 10.0% | $ 197,512 | 10.0% | $ 197,512 |
| Chilipepper | 1,944 | 6.2% | $ 143,488 | 10.0% | $ 231,432 |
| Splitnose | 437 | 5.7% | $ 20,868 | 10.0% | $ 36,610 |
| Yellowtail | 3,920 | 2.8% | $ 120,990 | 5.2% | $ 224,695 |
| Shortspine N | 1,498 | 1.3% | $ 34,776 | 2.2% | $ 58,851 |
| Shortspine S | 238 | 4.2% | $ 17,850 | 8.8% | $ 37,401 |
| Longspine N | 2,043 | 1.4% | $ 32,159 | 2.2% | $ 50,535 |
| Slope north | 909 | 2.0% | $ 20,040 | 3.0% | $ 30,060 |
| Slope south | 392 | 5.8% | $ 25,062 | 10.0% | $ 43,211 |
| Dover | 15,260 | 1.1% | $ 140,626 | 1.6% | $ 204,546 |
| English | 8,988 | 1.5% | $ 98,085 | 2.6% | $ 170,014 |
| Petrale | 2,172 | 1.4% | $ 64,357 | 2.3% | $ 105,729 |
| Arrowtooth | 9,582 | 1.9% | $ 44,151 | 3.2% | $ 74,359 |
| Starry Flounder | 923 | 10.0% | $ 81,395 | 5.5% | $ 44,767 |
| Other Flat | 4,517 | 1.3% | $ 51,783 | 2.0% | $ 79,666 |

The revenues in Table 1 should be considered maximum potential revenues, not expected or likely revenues. It is highly unlikely that a vessel owner will be paid for every QP in his or her vessel account. This could be due to several reasons, such as the possibility of there being insufficient market demand for certain species, limited access to certain species because of bycatch constraints, discard due to spoilage, some species may be unavailable in some years, etc.

After examining the potential amount of revenue associated with the existing options, the GMT examined the likely effect these accumulation limits would have on particular operations. The approach taken to examine particular operations was to identify specific regions along the west coast and make an attempt at identifying particular target strategies within each of those regions.

The GMT was able to identify four regions with different fishery characteristics: (1) northern Washington; (2) Westport to Newport; (3) Coos Bay to Fort Bragg; and, (4) San Francisco south.[14] Within each of these regions we focused on the top-three producers based on the notion that vessels in a rationalized fishery are more likely to be more similar to the existing larger producers rather than the smaller producers. From this examination we identify a representative set of particular target, or focus, species that vessels in each region tend to rely upon. It is important to note that there are undoubtedly other target bundles that vessels will rely upon in a rationalized fishery, and that are relied upon under status quo. The intention is to identify a representative set of various target strategy bundles to provide an indication for how the accumulation limits will affect fishing operations.

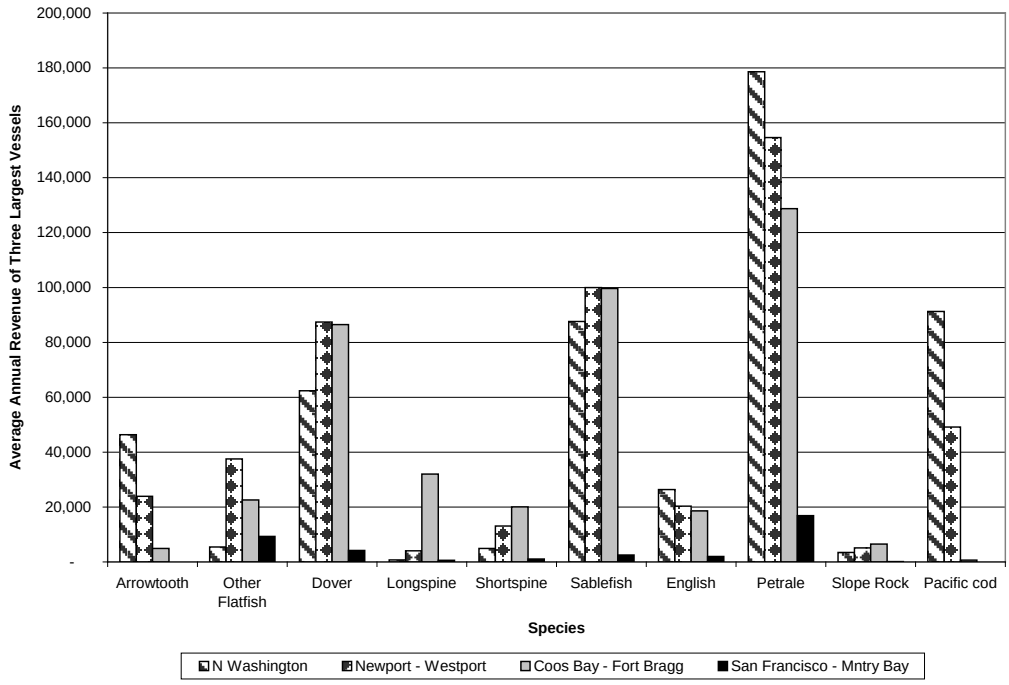


**Figure 2. "Top Producer" average annual exvessel revenues by region and target species (2004-2006).**

Several reasons appear to be responsible for the various target and market strategies, including regional variations in bathymetry, markets, and species availability. The northern Washington area is characterized by relatively high abundance of arrowtooth flounder and periodic availability of Pacific cod, while much of the fishing grounds extending from Coos Bay to Fort Bragg are comprised of continental slope grounds, making thornyheads relatively more important to fishing activity in that area.

[14] Avila-Morro Bay port group was combined with San Francisco-Monterey Bay because of a lack of data for the area.

**Table 2. "Top Producer" target strategies by region (excluding petrale and sablefish).**

| Region | Regionally Important Species |
|---|---|
| Northern Washington | • Arrowtooth<br>• English sole (marginal)<br>• Pacific cod |
| Newport – Westport | • Other Flatfish (for some vessels)<br>• Pacific cod (for some vessels)<br>• Arrowtooth (for some vessels)<br>• English sole (marginal) |
| Coos Bay – Fort Bragg | • Longspine<br>• Shortspine<br>• Slope rock (if regulations were more favorable) |
| San Francisco–Monterey Bay | • Other Flatfish |
| Morro Bay / Avila | • Not specifically identified due to lack of data. Limited data seems to indicate a fairly general strategy |

We use the target strategy bundles identified above in concert with the maximum potential revenues associated the GAC 90th percentile options (Table 3).[15] The results suggest that the 90th percentile options might make it difficult for an independent owner-operator to prosecute opportunities in a profitable manner, especially considering the likelihood that quota holders are highly unlikely to harvest and land all of their QP. More elaboration is included in the next section.

**Table 3. Maximum implied revenues by target strategy for 2004-2006 GAC and Max. Value Options**

| | | Maximum Potential Revenues | |
|---|---|---|---|
| Regional Strategy | Market Bundle | GAC Option 1 | GAC Option 2 |
| N WA | Arrowtooth, Dover, Sablefish, Petrale, P cod, English | $ 493,888 | $ 733,167 |
| S WA - C OR | Other Flat, Dover, Petrale, Sablefish, Arrowtooth, English | $ 471,918 | $ 743,690 |
| S OR - N CAL | Dover, Longspine, Shortspine, Sablefish, Petrale, Slope Rock | $ 364,874 | $ 559,097 |
| SF South | Other Flat, Dover, Sablefish, Petrale | $ 329,682 | $ 499,317 |

## E. Applying the Framework

*1. Species limits using the GMT Suggested Approach – The "GMT Option"*

The GMT applied the suggested framework and arrived at the species limits identified in Table 4. The limits identified as the "GMT Option" are intended as an illustration of how to apply the framework and for relative comparison to the other options being considered. In other words, the team's framework is meant as another aid for the Council to use in articulating its rationale for setting specific accumulation limits. The framework is not meant to, or capable of, producing "black and white" answers. Given the flexibility of the framework approach, and the discretion afforded to the Council by the MSA to define what is needed to prevent "excessive shares" and

[15] To create this table, we simply summed the maximum potential revenues from Table 1 for each species in the "market bundle" of each target strategy.

"inequitable concentration" of TIQ, the team fully expects that the Council could apply the framework and derive a different set of limits.

Table 4 lists species limits in a different order than tables previously considered by the Council because of the team's "benchmark" approach (which is explained in detail in a subsequent section). This order, and the rationale behind each species limit, is described in detail below in section E.3. Table 5 translates the GMT Option species limits into maximum potential revenues for each of the four target strategy bundles.

**Table 4. Species limits developed using the GMT's suggested approach ("GMT Option") compared to the GAC recommended options and maximum value scenarios.**

| | GAC Option 1 | GAC Option 1 Revenue | GAC Option 2 | GAC Option 2 Revenue | GMT Option | GMT Option Revenue[1] | | Max Entity Allocation[2] |
|---|---|---|---|---|---|---|---|---|
| Petrale | 1.4% | $64,357 | 2.3% | $105,729 | 3.0% | $137,907 | | 3.8% |
| Sablefish N. | 1.0% | $72,917 | 1.5% | $109,376 | 3.0% | $218,751 | | 3% |
| | | | | | | | | |
| Shortspine N. | 1.3% | $34,776 | 2.2% | $58,851 | 6.0-10% | $160,503 | | 3.7% |
| Longspine N. | 1.4% | $32,159 | 2.2% | $50,535 | 6.0-10% | $137,824 | | 3.5% |
| Slope Rock N. | 2.0% | $20,040 | 3.0% | $30,060 | 6.0-10% | $60,120 | | 4.1% |
| Slope Rock S. | 5.8% | $25,062 | 10.0% | $43,211 | 6.0-10% | $25,926 | | 7.8% |
| | | | | | | | | |
| Arrowtooth | 1.9% | $44,151 | 3.2% | $74,359 | 10.0%+ | $232,371 | | 6.2% |
| Starry Flounder | 10.0% | $81,395 | 5.5% | $44,767 | 10.0%+ | $81,395 | | 30.5% |
| Other Flat | 1.3% | $51,783 | 2.0% | $79,666 | 10.0%+ | $398,331 | | 9.2% |
| | | | | | | | | |
| Dover | 1.1% | $140,626 | 1.6% | $204,546 | 5.0%+ | $639,208 | | 3% |
| English | 1.5% | $98,085 | 2.6% | $170,014 | 5.0%+ | $326,950 | | 3.5% |
| | | | | | | | | |
| Pacific Cod | 6.4% | $73,754 | 6.0% | $69,144 | 20.0% | $230,480 | | 10% |
| | | | | | | | | |
| Chilipepper | 6.20% | $143,488 | 10.0% | $231,432 | 10.0% | $231,432 | | 14.8% |
| Splitnose | 5.70% | $20,868 | 10.0% | $36,610 | 10.0% | $36,610 | | 10.4% |
| Yellowtail | 2.80% | $120,990 | 5.2% | $224,695 | 5.0% | $216,053 | | 3.7% |

1) In cases where the GMT option includes a range of limit percentages, the potential revenue estimate is based on the lower end of the range.

2)Unlike the GAP and GMT options, the Max Entity Allocation formula is calculated as a percentage of fleet-wide landings during the window period (i.e., not as a percentage of the total OY or trawl allocation). In addition, it is important to note that this column is an estimate of the max initial allocation level as if no accumulation limits existed (and based on entity ownership as of January 2004)

**Table 5. Maximum potential revenues for GMT and GAC 90th Percentile Options (GMT Option revenues are derived from the limits in Table 4).**

| | | Maximum Potential Revenues | | |
|---|---|---|---|---|
| Regional Strategy | Market Bundle | GAC Option 1 | GAC Option 2 | GMT Option |
| N WA | Arrowtooth, Dover, Sablefish, Petrale, P cod, English | $ 493,888 | $ 733,167 | $ 1,785,667 |
| S WA - C OR | Other Flat, Dover, Petrale, Sablefish, Arrowtooth, English | $ 471,918 | $ 743,690 | $ 1,953,518 |
| S OR - N CAL | Dover, Longspine, Shortspine, Sablefish, Petrale, Slope Rock | $ 364,874 | $ 559,097 | $ 1,414,053 |
| SF South | Other Flat, Dover, Sablefish, Petrale | $ 329,682 | $ 499,317 | $ 1,394,197 |

*2. Quota Holdings vs. Limit & Substitutability*

Before examining the rationale behind deriving the individual species limits, it is important to consider a couple of different concepts. First, it is improbable that each entity participating in the fishery will hold quota share up to the control limit of each species. In other words, it is highly unlikely that the fishery would contract down to the absolute minimum number of owners or vessels permitted by a given species-specific control limit (e.g., a 2% species-specific accumulation limit with 50 entities/vessels).

Consider sablefish and petrale sole. Given that these two stocks are "at the core" of the industry's economic activity, it would be expected that they would be the most vulnerable to full contraction to the absolute minimum number of owners. Although it is reasonable to expect more entities than average will hold quota share at the accumulation limit, it is with near certainty that several entities will not reach the limit. With petrale sole, we can explain this reasoning by comparing entities that participate in the groundfish trawl fishery year round to those that participate in other fisheries. Those that participate in the Dungeness crab fishery, for example, are likely to forego much of the opportunity that exists for winter petrale, and it is during the winter where most of the petrale sole volume tends to be caught. That may change to some degree in a rationalized fishery, but nevertheless, entities engaged in multiple fishery strategies will be less likely to acquire quota share up to the control limits, simply because they will have a diversified operation and will rely less on trawl groundfish than full time groundfish vessels.

A second issue associated with the species specific limits is the concept of substitutability. In the simplest terms, if a good can be substituted with another good in a marketplace, then market control may not be possible. If an entity was attempting to exert control over the marketplace for coffee in order to raise prices, a consumer could simply purchase another brand and avoid those high prices. The same considerations hold true for fish products in the marketplace. Very few species have no easy substitute. Several species of red rockfish exist along the west coast, and it is reasonable to expect that there is very little preference in the marketplace for one type of red rockfish species over another, though there are circumstances where preferences may exist. The same appears true for flatfish. Therefore, it is reasonable to state that issues of control do not appear to be a relatively large concern for red rockfish species and most flatfish species. Where substitutability may be an issue is for sablefish and petrale sole. Each of these species is highly desirable in the marketplace, meaning they are preferred over other types of west coast seafood products. This preference can be reasonably equated with a lack of substitutes, meaning control issues at the species level may exist for these two species.

*3. Explanation of Species Specific Limits*

The following table serves as an executive summary that utilizes the GMT suggested framework to derive species specific limits. The rationale for these species specific limits is provided next to the derived accumulation limit percentages.

**Table 6. Summary of rationale used to derive species specific limits**

| Species | Control Limit | Rationale |
|---|---|---|
| • Sablefish<br>• Petrale sole | 3% | • Lack of market substitutes combined with high importance to the fishery argues for relatively low control limits<br>• Limits less than 3% may cause some disruption to existing activity, while limits higher may not be necessary for owner-operators |
| • Slope rockfish<br>• Shortspine N<br>• Longspine N | 6% to 10% | • More substitutable in the marketplace than sablefish and petrale sole, meaning limits do not need to be as low<br>• Thornyheads seem less substitutable than slope rockfish (thornyhead limits should arguable be less than slope rockfish limits)<br>• Regionally important, which may necessitate limits that are somewhat higher than petrale and sablefish to accommodate regional strategies<br>• A 6% limit may accommodate regional strategy bundles, while a 10% limit may allow for thornyhead and slope rock specialists |
| • Arrowtooth<br>• Starry Flounder<br>• Other Flatfish | 10% or greater | • More substitutable in the marketplace than slope rockfish or thornyheads, meaning limits could be higher than those species<br>• Regionally important species, which may necessitate higher limits to accommodate those activities<br>• Relatively underutilized stocks. Increasing utilization may rely on an entity controlling sufficient quota to build markets |
| • Dover sole<br>• English sole | 5% or greater | • Substitutable in the market place, meaning relatively higher limits may not lead to control issues<br>• Widely distributed and widely fished stocks, meaning higher limits are not necessary to accommodate regional strategies<br>• Relatively underutilized stocks. Increasing utilization may rely on an entity controlling sufficient quota to build markets<br>• Large OYs mean substantial fishing activity could occur with a low accumulation limit. Independent owner-operators may not "need" large limits to accommodate operations. If OYs are reduced, higher limits that are similar to other types of flatfish may be more appropriate |
| • Pacific cod | Up to 20% | • Regionally distinct<br>• Heavily relied upon by a small number of entities<br>• Generally substitutable in the market<br>• Limits lower than 20% may disrupt recent activities of independent owner operators |
| • Yellowtail<br>• Chilipepper<br>• Splitnose | • 5%?<br>• 10%?<br>• 10%? | • Stocks are generally not targeted under existing conditions making it difficult to assess in terms of accumulation limits<br>• All stocks are highly underutilized. Increased utilization may necessitate an entity holding relatively large amounts of quota to build markets<br>• Stocks are regionally distinct<br>• Yellowtail has sufficient overlap between non-whiting and SS whiting activity, meaning careful consideration should be given to this species<br>• All three species are substitutable with other rockfish in the market, meaning their control limits could be higher than petrale and sablefish |
| • Sablefish south<br>• Shortspine south | No specific suggestion | • Existing conditions make it difficult to fit these species into the framework. Different rationale may be more appropriate for these stocks |

Petrale sole and Sablefish N. – The Benchmark Stocks

The GMT's application of the framework approach begins with sablefish N. and petrale sole. These two are the key economic stocks and are relied upon to a large degree by nearly every trawler along the coast. Moreover, under status quo the two stocks have few, if any close substitutes and are highly desirable. In other words, an entity that holds quota share for petrale and/or sablefish could use that to its advantage in order to secure favors from others. For these reasons, we assume that control limits for these two stocks should be set the lowest relative to other stocks.

Based on the regional target strategies and maximum potential revenues above in Tables 4 and 5, we settled on the following control limits:

- Petrale sole = 3%
- Sablefish North = 3%

While the petrale sole limit would truncate the activities of entities operating over the 2004 to 2006 period, it would only truncate those entities operating in 2005.[16] During the 2005 season, exceptional weather allowed for much greater than expected (and intended) harvests of petrale sole during the first period. Therefore, those 2005 petrale sole records are not considered representative relative to the 2004 to 2006 period. The elimination of such records appears to make the 3% limit non-constraining on existing activity.

The 3% sablefish limit results in revenues that are slightly higher than recent activity. However, it is important to note that during recent years the sablefish resource has been underutilized to some degree due to regulatory constraints. If entities would have been able to harvest the full trawl sablefish allocation, it is likely that the larger producers would have attained a level near 3%. In order to accommodate the forecasted utilization of sablefish in the IFQ program, while also keeping control limits low so as to protect against market influence potential, a 3% control limit appears reasonable.

Thornyhead and Slope Rockfish Control Limits

Control limits for thornyheads and slope rockfish can be considered next to the benchmark species of sablefish and petrale sole. The region stretching from Coos Bay to Fort Bragg is heavily reliant on a slope-based strategy, and thornyheads and slope rockfish comprise a large portion of that strategy (though existing regulations may limit that focus to a large degree – especially for slope rockfish). Other regions undoubtedly target these species, but it appears that this southern Oregon to north-central California region relies on those stocks to a much greater degree. Therefore, it is safe to assume that slope rockfish and northern thornyheads have a regional focus.

Slope rockfish are sold in a market that can be substituted with other types of rockfish species. This substitutability reduces potential issues of control. For example, an entity which holds

[16] To accommodate activity from 2005, a limit of 8% may be necessary.

quota share of slope rockfish may attempt to use that to his advantage when dealing with others, but to some degree one may be able to focus on a different species if they do not wish to negotiate with the holder of slope rockfish, thereby circumventing attempts at market control. Furthermore, the value of slope rockfish is less than that of petrale and sablefish, and this would tend to reduce the effectiveness of using slope rockfish quota as a leverage piece in negotiation/discussion, so control issues are also reduced due to the relative price per pound. Thornyheads have fewer substitutes, meaning control issues may be a somewhat greater concern for thornyheads than for slope rockfish. In addition to the above factors, both the thornyhead and slope rockfish resources are under-utilized. If we expect the resource to be more fully utilized – and wish to allow independent owner-operators the ability to expand operations to more fully utilize that resource – then opportunities will need to be increased. It may be necessary to allow entities to hold relatively large amounts of quota to build markets for under-utilized stocks.

For the above reasons, it appears that thornyhead and slope rockfish control limits should be set higher than petrale and sablefish control limits. The GAC option ($90^{th}$ percentile) would result in control limits that are lower than petrale and sablefish for some species/option combinations. The particular control limit for these species can be informed through existing data (including current fishing activity). It can also be informed by taking a forward looking approach which considers the fact that fleet consolidation is likely, and that a portion of that to-be-consolidated fleet will exist in the southern Oregon to north-central California region.

By starting with existing data, we find that the $90^{th}$ percentile options result in revenue opportunities that are similar to status quo. However, for some species these control limits are smaller than petrale and sablefish. In addition, when combined with the regional bundle approach, the Coos Bay to Fort Bragg area will need to derive substantial portions of revenue from northern thornyheads and slope rockfish. In order to accommodate sufficient opportunity for owner operators in this southern Oregon to north-central California area, it appears that a 6 percent control limit would be appropriate, but a control limit up to 9 or 10 percent may still be reasonable. Given the relative lack of substitutes for thornyheads, it appears appropriate to set thornyhead control limits at a somewhat lower level than slope rockfish.

- Shortspine North = 6% to 10%
- Longspine North = 6% to 10%
- Slope Rockfish = 6% to 10%

<u>Arrowtooth, Starry Flounder, and Other Flatfish Control Limits</u>

Flatfish control limits can be approached similarly to the thornyhead and slope rockfish species as described above. However, flatfish arguably have even greater substitutability among one another, have lower prices, and are more under-utilized than the slope rockfish and thornyhead stocks. The fact that they appear more substitutable among one another, and have lower prices than the core species of petrale and sablefish, as well as slope rockfish and thornyheads, suggests that the control limits for flatfish species could be set higher than petrale and sablefish and also higher than the control limits for thornyheads and slope rockfish.

We consider flatfish control limits in the context of the slope rockfish and thornyhead limits and also the existing options for control (maximum share and 90$^{th}$ percentile truncated at 10%). The thornyhead and slope rockfish control limits discussion suggested a limit of up to 9% would be appropriate, however the GAC recommended a cap on control limits of 10%. These factors suggest that control limits for the largely underutilized, or regionally distinct flatfish stocks could be set at 10%, though additional considerations may warrant a larger limit. These stocks include arrowtooth flounder, starry flounder, and Other Flatfish.

- Arrowtooth = 10%+
- Starry Flounder = 10%+
- Other Flatfish = 10%+

Dover Sole and English Sole Control Limits

Dover sole is a widely targeted stock, but it is underutilized, has a low price per pound, and can be substituted on the market with other types of flatfish. English sole is not as widely targeted, but has a fairly wide distribution of catch, and has the same issues with relative substitutability and price. Accumulation limits for these two species can be viewed somewhat differently than the accumulation limits for the flatfish stocks mentioned above. This difference is derived from the consideration of "need", or necessary volume to accommodate independent owner-operator activities. The magnitude of the OY for both of these stocks (English and Dover) is substantially higher than for other types of flatfish, meaning a relatively small accumulation limit could accommodate relatively large amounts of fishing activity. We examine control limits for these two species using the concept of setting accumulation limits at a level that would accommodate independent owner operators engaged in regional strategies, while at the same time benchmarking those limits against petrale and sablefish. From these considerations, it appears a 5 percent control limit would be appropriate for both Dover sole and English sole. This limit is higher than petrale and sablefish because issues over market control do not appear to exist for Dover and English like they do for sablefish and petrale. However, this limit is smaller than for some of the other types of flatfish stocks because there does not appear to be a "need" for limits as high as those stocks if the intention is to accommodate an independent owner operator. However, if OYs for these stocks become more similar to OY levels for other types of flatfish, it may be more appropriate to set Dover and English accumulation limits at levels similar to those other types of flatfish.

- Dover sole = 5%+
- English sole = 5%+

Sablefish South and Shortspine South

The control limits for both sablefish and shortspine south appear to be a special case. There was limited data available for this region and it is believed that a single entity would be the recipient of the vast majority of the quota. It is unclear whether new entities would move to fill the place of that entity if it was forced to divest of quota (or did not receive quota in the first place, if divesting was not allowed). Because of this reason, the consideration for control limits that

would allow independent owner operators to operate profitably does not seem relevant. Therefore, the GMT does not have particular comment on these species.

Pacific Cod

The Pacific cod species distribution is regionally distinct (northern Washington) and may also be one of the least reliable target species along the coast. Pacific cod are simply unavailable to fishermen during some years. During years when it is available, it typically appears in a relatively small location off northern Washington where there are relatively few LE trawl vessels.

It may be reasonable to assume that Pacific cod is weakly substitutable in the market place by other types of whitefish. The price for Pacific cod is somewhat lower than that for shortspine thornyhead (over the 2004 – 2006 period), but is on par with slope rockfish. This means that control may be more of an issue for Pacific cod than for flatfish. However, independent owner operators in the area may tend to rely heavily on this stock during years when it is available. This relative reliance may argue for a higher control limit than other species, even though doing so would represent a slight departure from the approach taken for other species. The rationale for departing from the approach above (which may tend to put Pacific cod control limits on par with thornyhead and slope rockfish limits) is that doing so would heavily restrict some of the recent activity on Pacific cod. In recent years, several vessels operating in the area have generated between $100,000 and $150,000 on Pacific cod. When combined with fleet consolidation and the consideration for allowing an owner operator to remain profitable, control limits may need to allow for greater amounts of revenue. To allow this type of activity, a control limit of 20 percent may be reasonable.

Chilipepper, Yellowtail, and Splitnose

Chilipepper and yellowtail are highly under-utilized under existing conditions due to the need to protect weak stocks. It is envisioned that access to these species will change in a rationalized fishery as individuals become accountable for their catch and bycatch and change behavior. Due to the lack of recent information on how these species may play out in terms of regional dependence, markets, etc., it is difficult to put these species into the framework outlined above which uses petrale sole and sablefish as benchmarks. Furthermore, yellowtail will continue to interact heavily with the shoreside whiting fishery, and will interact much differently with non-whiting activity. Therefore, it is important to consider yellowtail in the context of both shoreside whiting operations and non-whiting operations.

The GAC 90$^{th}$ percentile options result in two very different results. One option would result in a yellowtail control limit that is less than sablefish and petrale sole, which does not seem appropriate given the relatively less reliance of the industry on yellowtail, the lower price per pound, and the fact that yellowtail can be substituted in the market with other rockfish. However, it is difficult to put yellowtail into this benchmark framework. One consideration is to place yellowtail limits at a level that results in opportunities that are on par with other types of target species. It appears that a control limit of 5 percent would allow vessels the same scale of

opportunity as other target species. However, this limit should also be thought of in context of incidental encounters in shoreside whiting activity, which would take additional analysis.

Chilipepper can be thought of in a similar context to yellowtail, although it has no interaction with the whiting fishery so it is somewhat easier to consider. Both 90$^{th}$ percentile options would result in control limits that are higher than petrale sole and sablefish, and that appears reasonable. The larger 90$^{th}$ percentile option results in a 10 percent control limit. When viewed in the context of other target species limits, a 10 percent control limit provides for a level of opportunity that is on par with many other target species.

Splitnose is a somewhat difficult species to assess as well. Substantial opportunity exists for this species under existing conditions, yet interest appears relatively minor. In order to allow for focus to continue to exist on this stock by independent owner operators, it may be reasonable to set a control limit for splitnose at 10 percent, or possibly higher. Furthermore, to increase utilization of such underutilized species, it may be necessary to allow an entity to control relatively large amounts of quota in order to build markets.

## F. The Aggregate Limit

The GMT's suggested approach would set species limits substantially higher than either of the GAC 90$^{th}$ percentile options with the purpose of accommodating a diversity of target strategies. On its own, this set of relatively higher species limits could increase control and consolidation of quota ownership in the fishery. To counter such consolidation, the relatively higher species limits would be accompanied by a relatively low aggregate control limit. Before describing this in more detail, we first discuss how the aggregate limit is calculated.

### *1. The Importance of the Aggregate Limit Formula*

As currently described in the DEIS, the aggregate quota holding estimate would be calculated based on a weighted average with each species weighted according to its relative tonnage (i.e., metric tons of species "X" / total metric tons in the trawl sector allocation). There are two issues with this current formulation.

First, the formula is dynamic and would produce different results each biennial cycle when OYs change. For example, an increase in the OY for species X would increase the total tonnage in the trawl sector allocation (i.e., the denominator), and in all likelihood, would change the relative weight of species X to the other species. As a result, quota holders will face a change in their aggregate quota holdings each cycle, potentially placing them above an aggregate accumulation limit through no action on their part. On this issue, the team simply notes the dynamic nature of the formula and questions whether it might cause market uncertainty. Unable to reliably predict where OYs may go, quota holders may be unable to judge where they might stand against the aggregate limit beyond the next biennial cycle, complicating the type of longer-term investment decisions needed to improve the economic status of the industry. Static formulas are possible.[17]

[17] Static does not mean permanent. The formula could remain static until altered by Council action.

Second, consistent with the revenue-based approach, the team discussed basing the aggregate quota formula on a revenue-based weighted average. In doing so, it became evident that estimating aggregate control is highly sensitive to how it is calculated.

Table 7 illustrates this sensitivity. To create Table 7, the team used the GAC recommended control limit options and assumed a scenario where the fishery consolidated to the absolute minimum number of entities (i.e., every entity acquired QS up to the limit for each individual species). We then calculated the resulting aggregate quota share holdings for both GAC options using: (1) a simple average approach ("equal weighting"); (2) the weighted average based on tonnage ; and, (3) a weighted average based on the amount of exvessel revenue generated by each species over the 2004-2006 time period.

**Table 7. Comparing three alternatives for calculating aggregate quota share holdings**

| | Option 1 | Option 2 |
|---|---|---|
| Existing option --> Trawl allocation weighting formula | 1.95% | 3.02% |
| Equal weighting of each species | 3.53% | 4.76% |
| Weighting that uses 2004 - 2006 sector revenues by species | 1.64% | 2.28% |

The three formulas not only produce different estimates of aggregate control, they also differ in their degree of change between GAC Option 1 and Option 2 (Table 7).

Because of this sensitivity, we recommend that the Council give careful consideration to the current formula and its underlying rationale. The team could only give brief attention to the possible rationales, yet offers this summary to stimulate feedback from other advisory bodies and the public:

- Trawl allocation weighting formula (tonnage): The amount of catch and delivery activity in the trawl fishery will be related to the amount of fish available to the trawl sector. Thus, the aggregate control limit should be based on the tonnage of each species allocated to the trawl sector to best prevent excessive control within the sector.

- Equal weighting of each species: Simplicity generally helps markets function effectively. Simplicity makes it easier to develop expectations about the future, and this is important for making longer-term investment decisions.

- Exvessel revenue weighting formula: The amount of revenue associated with each species is a measure of its economic importance to the fishery. Therefore, placing more weight to species that generate more value would more relate the aggregate control estimate to activity and importance of species to the fishery.

*2. Interplay between the Aggregate Limit and Species Specific Limit*

In this section we explore in more detail how a relatively low aggregate limit interacts with species limits using the independent vessel owner scenario and the regional target strategies.

To analyze the relationship between aggregate limits and species limits, we plotted the GMT Option maximum potential revenues for each of the four regional target strategies against a decreasing aggregate limit, with the aggregate limit calculated using the DEIS ("status quo") formula (Figure 3).

The plot for each target strategy begins at the aggregate limit that would accommodate the full maximum potential revenue allowed by the GMT Option species-specific limits. We then envisioned how the independent vessel owner would respond if the aggregate control limit was decreased. We assumed that the entity would choose to divest itself of the lowest price per pound species until its portfolio lowered to the limit and then recalculated the maximum potential revenue associated with that new portfolio. The assumption, supported by substantial literature, is that fishermen chase prices and the highest value species draw the most effort and interest. Repeating this exercise for successively smaller aggregate limits produced the trends in Figure 3.

At the relatively higher aggregate limits, we notice a fairly non-linear relationship between the limit and exvessel revenue because of the species that are being divested, their price per pound, and their weighting relative to the aggregate control calculation. The relationship becomes more linear as the lowest value species disappear from the portfolios. The trend is clearly related to the aggregate limit formula and would differ if the formula were changed.

The major point the team keyed into is that the aggregate control limit lowers the maximum potential revenue level without altering the species limits. With the species limits the same, the independent vessel owner has the choices of which limits to pursue in attempting to reach the maximum revenue possible under the aggregate limit. In other words, this makes it possible for operations to pursue a regional/specialty-type of strategy, while maintaining an overarching level of control over individual operations.

Also of note is how the aggregate limit affects the regional strategies somewhat differently. For example, if the goal is to allow an entity to engage in activities that could potentially allow them $1,000,000 in exvessel revenue, then a 1.6% limit may be large enough for those entities operating in the southern Oregon to northern California region. In contrast, a 2% limit would be needed to create that same potential for entities operating in the San Francisco to Morro Bay region.

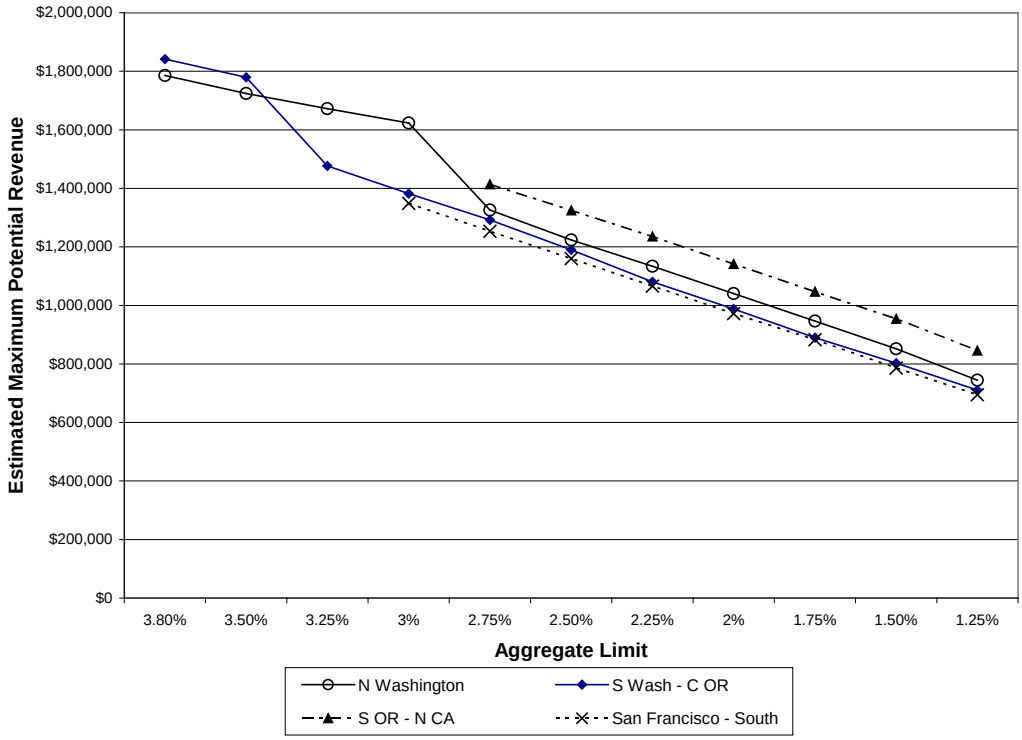


**Figure 3. Estimated maximum potential revenue by regional target stratgey and aggregate control limit.**

*4. The Aggregate Control Limit Beyond the GMT Approach*

The individual accountability and transferability at the core of the TIQ program are expected to lead to needed change in vessel operations and efficiency. The GMT Option and revenue-based framework are focused on identifying species limits that favor promoting this reorganization over restricting entities to existing practices. In this case, the aggregate limit would be a vital safeguard for achieving the Council's other management objectives for accumulation limits.

The team did not have time to thoroughly discuss the aggregate limit in the context of the other approaches to setting accumulation limits, yet we presume the aggregate level could continue to serve an important role no matter which approach the Council uses to derive species limits. We offer the following observations on how the aggregate limit fits with some of the alternative rationales being considered by the Council:

- If the intention is to allow each entity to acquire their potential initial allocation, then:
  *an aggregate limit of 2.7% appears to accommodate this consideration (based on ownership from Fall 2006).*

- If the intention is to cap the initial allocation of quota share at a level that is consistent with the control date, then
  *An aggregate limit of 2.7% appears to achieve this consideration.*

- If the intention is to retain limits similar to status quo vessel shares, then:
  *An aggregate limit of 2.3% would achieve this consideration.*

- If the intention is to have more consolidation than exists under current conditions, then:
  *An aggregate limit in excess of 2.3% may be necessary.*

## G. Results Under A Different Set of OYs

The analysis presented in this document assumes 2010 OYs. These OYs were used because they represent the best known set of allowable catch levels when a rationalized fishery is intended to go in place (2011). Undoubtedly allowable catch levels will vary through time, and at times such variation may be significant. When there are large variations in OY levels, it may be appropriate to consider a revision to accumulation limits either upward or downward. It may also be appropriate to reconsider the formula for calculating the aggregate control limit. We identify two sets of non-overfished species that are contained in this analysis for which this has recently occurred. Both English sole and Dover sole have experienced substantial increases in OY levels compared to what existed in 2005. If these OY levels were to be reduced back to a level that is more similar to Other Flatfish and arrowtooth flounder, for example, it may be appropriate to alter the accumulation limits of Dover and English so that they more closely match other types of under-utilized, easily substitutable flatfish. For other types of species or situations, other types of considerations may be more appropriate.

## H. Conclusion

The GMT expects to further elaborate on this framework approach at the March Council meeting in partnership with Council staff via a presentation or supplemental report to the Council. There are many issues related to this approach that time did not permit us to discuss or report on here (e.g., the vessel limits as twice the control limit approach, entities that own multiple vessels).