



New England Fishery Management Council

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MEMORANDUM

DATE: November 1, 2012
TO: Scallop and Groundfish Committees
FROM: Scallop Plan Development Team (PDT)
SUBJECT: **Preliminary economic impacts on the scallop fishery from the YT sub-ACL allocation alternatives under consideration in GF Framework 48**

Groundfish Framework 48 is considering two alternatives for allocating the GB YT sub-ACL to the scallop fishery. The first alternative is a range of 8-16% of the total ABC. For 2013 that is equivalent to 17.2 mt to 34.4 mt if the total US allocation is 215 mt. The second alternative is 90% of the projected catch estimate. Groundfish FW48 may also recommend that the total GB YT TAC be 1,150 mt, which would set the US share at 495 mt, rather than 215 mt.

There are five specification alternatives under consideration in Scallop FW24 for scallop fishery allocations, including the No Action alternative. The range of GB YT catch estimates for those alternatives is 73-222 mt. (Table 1). Therefore, the overall range of GB YT sub-ACL alternatives before the Council is quite broad; as low as 17.2 mt or about 200 mt, almost the entire US ABC. In order to assist the Council with this allocation decision the Scallop PDT has prepared some initial analyses of potential impacts on the scallop fishery from the different allocation alternatives. The Scallop PDT did not discuss and does not have input on a preferred alternative for this subject since it is primarily an allocation decision.

Table 1–Summary of GB YT catch estimates for the various scallop specification alternatives (2013-2014)

	No Action		Alt1		Alt2		Alt3		Alt4	
	2013	2014	2013	2014	2013	2014	2013	2014	2013	2014
GB Open	27	33	34	41	34	41	34	41	34	41
CL1	0	0	2	0	2	0	0	0	2	0
CL2	194	285	139	161	98	169	111	132	37	57
Total	222	318	175	202	134	210	145	173	73	97
% US TAC = 215 mt	103%		82%		62%		67%		34%	
% US TAC = 495 mt	45%		35%		27%		29%		15%	

GB YT sub-ACL equivalent to 8% - 16.7 mt of GB YT (or 38.4 if US ABC = 495 mt)

In order to evaluate the potential impacts of this YT allocation alternative the Scallop PDT has assumed that new measures would need to be developed in FW24 to adjust to this low level of YT catch. A sub-ACL of 16.7 mt (based on a sub-ABC of 17.2 mt) of GB YT for the scallop fishery in 2013 is not workable with any of the current specification alternatives under consideration. In order to reduce YT catches to that level it would be necessary to eliminate all access into CA2, and even then there would still be a very high likelihood that the 2013 sub-ACL of 16.7 mt would be exceeded since open area YT catch estimates are 34 mt.

Setting the scallop allocation of YT much lower than estimated catch levels, and not implementing complementary measures to keep YT catch at those lower levels, increases the chance of the sub-ACL being exceeded by a larger amount. If the scallop fishery exceeds their sub-ACL, and the GF fishery catches all of the sub-ACL, the total US allocation will be exceeded. Under the sharing agreement with Canada that means the 2014 US share would be reduced by the overage. This would impact both fisheries if the 2014 sub-allocation is not set already for the scallop fishery, or if the sub-ACL is a straight percentage of the US ABC. Therefore, setting a sub-ACL for the scallop fishery at a level that is likely to be exceeded could actually impact the groundfish fishery as well in the following year.

The Framework 24 specification alternatives have different trip allocations and possession limits for CA2 (Table 2). Alternative 2 is the specification alternative that allocates the maximum number of trips per area to optimize scallop yield, particularly in the shorter term. The amount of effort allocated to Closed Area 2 under Alternative 2 is 1,072 mt (2.4 million pounds), or 182 full-time trips at 13,000 pounds per trip (Table 2). In light of the very constraining GB YT ACL in 2013, the Scallop PDT developed a specific specification alternative to reduce YT bycatch upfront (Alternative 4). Alternative 4 reduces CA2 effort by more than half to 405 mt (about 900,000 pounds, or 50 18,000 pound trips) compared to Alternative 2.

The GB YT sub-ACL allocation alternatives will have different impacts depending on the FW24 specification alternative. To express these potential impacts the PDT has assumed that all 2013 CA2 effort would need to be delayed, and an AM would be triggered in 2014, which would again close CA2 for the entire year since the fishery is likely to exceed 17.2 mt by more than 50%. For these analyses, this sub-ACL allocation would prevent CA2 fishing in both 2013 and 2014. Finally, since this sub-ACL is much lower than the estimate of YT catch for open areas the Council may want to consider some type of constraint in open areas to further reduce YT bycatch (i.e. seasonal restrictions or max DAS usage in GB YT stock area).

For these analyses the Scallop PDT focused on Alternative 2 and 4, since those options seem to be favorable over Alternative 1 and 3 even though Table 3 and Table 4 below show the results for all the alternatives included in Framework 24.

For ALT-2, closure of CA2 would reduce scallop landings by 2,366,000 lb. in 2013 and by 1,635,000 in 2014. This would lead to a reduction of \$24.4 million in 2013 and \$16.7 million in 2014. In terms of the present value of the revenues (discounted at 3%), total loss in scallop revenue would amount to a total of \$39.9 million in 2013-2014, which is a 5.3% reduction in total revenue in the same period. For ALT-4, the reduction in landings (by 1,656,000 lb.) and revenues (a reduction of \$16.5 million in the present value of the total revenue) are smaller compared to ALT-2 for the same period including 2013 and 2014

fishing years. Thus because a lower number of trips (50 trips in 2013 and 56 trips in 2014) were allocated to CA2 under ALT-4 compared to ALT-2 (Table 2). Thus, even though ALT 4 would result in lower overall landings, revenues and total benefits for the scallop fishery in the short-term compared to ALT-2, it will also minimize impacts of a CA2 closure if the GB YT AMs are triggered. Further comparison of these alternatives are provided below in the subsection with GB YT ACL equivalent to 90% and in Table 6 and Table 7.

Table 2. Number of trips allocated for CA2 and possession limits under different alternatives included in Framework 24

Scenarios	Fishing year	Number of trips	Possession limit	Total landings (lb.)
Alt 1	2013	262	13,000.00	3,406,000
	2014	64	15,000.00	960,000
Alt 2	2013	182	13,000.00	2,366,000
	2014	109	15,000.00	1,635,000
Alt 3	2013	136	18,000.00	2,448,000
	2014	65	15,000.00	975,000
Alt 4	2013	50	18,000.00	900,000
	2014	56	13,500.00	756,000

Table 4 takes into account the impacts of CA2 on effort, the present value of the consumer and producer surpluses and total economic benefits from the scallop fishery. Even though a decline in days spent fishing would reduce trip costs, the producer surplus (total revenue net of trip costs) would still be lower due to the decline in revenue, by \$36.8 million for ALT2 and by \$15.3 million for ALT4, from CA2 closure in both 2013 and 2014 fishing years. The reduction in landings would reduce consumer benefits as well and total economic benefits (sum of consumer and producer surpluses) would decline by \$41.5 million (or by 5.6%) for ALT-2 and by \$17.3 million (or by 2.4%) for ALT-4 with the closure of CA2 in 2013 and 2014 fishing years. Again, the impacts with ALT-4 are lower compared to ALT-2 because of the smaller allocations to CA2 with the former. It is true that if Closed Area 2 is closed in 2013 and 2014, that area could be accessed in the future, but natural mortality will impact some portion of the biomass reducing potential harvest over the long-term as well.

If the US ABC is 495 mt, the scallop sub-ACL under this alternative would be 38.4 mt (based on a sub-ABC of 39.6 mt). This level of YT catch would reduce the risk of the scallop fishery exceeding the sub-ACL compared to a sub-ACL of 16.7 mt, but since it is similar to the amount projected for GB open area fishing (34 mt), it too would potentially require that CA2 trips be eliminated for 2013. There would still be a risk of exceeding a sub-ACL of 38.4 mt, not as great as the 16.7 mt, but still possible.

Table 3. Economic impacts of a closure of the CA2 on landings and revenues

Alternatives	Year	Decline in Scallop landings with CA2 Closure	Estimated Price (not adjusted for inflation)	Decline in Estimated Revenue (\$ million)	Decline in PV of Revenue (\$ million)	Revenue from all areas without closure (\$ million)	Decline in Scallop Revenue as a % of Total revenue
Alt 1	2013	3,406,000	10.24	34.9	33.9	382.0	8.9%
	2014	960,000	10.23	9.8	9.3	372.3	2.5%
Total for 2013-2014		4,366,000		44.7	43.1	754.3	5.7%
Alt 2	2013	2,366,000	10.29	24.4	23.6	382.0	6.2%
	2014	1,635,000	10.21	16.7	16.2	373.6	4.2%
Total for 2013-2014		4,001,000		41.1	39.9	755.5	5.3%
Alt 3	2013	2,448,000	10.23	25.0	24.3	358.1	6.8%
	2014	975,000	10.23	10.0	9.7	375.2	2.5%
Total for 2013-2014		3,423,000		35.0	34.0	733.4	4.6%
Alt 4	2013	900,000	10.33	9.3	9.0	362.8	2.5%
	2014	756,000	10.22	7.7	7.5	366.0	2.0%
Total for 2013-2014		1,656,000		17.0	16.5	728.8	2.3%

Table 4. Economic impacts of a closure of the CA2 on economic benefits from the Scallop Fishery (All the monetary values are shown in terms of present value of discounted benefits using a rate of 3%)

Alternatives	Year	Decline in Producer Surplus (PV, Million \$)	Decline in Consumer Surplus (PV, Million \$)	Decline in Total Benefits (PV, \$ Million)	Total benefits without closure (PV, \$ Million)	% Decline in total benefits
Alt 1	2013	31.0	4.0	35.1	375.4	9.3%
	2014	8.6	1.1	9.7	369.6	2.6%
Total for 2013-2014		39.6	5.1	44.7	745.0	6.0%
Alt 2	2013	21.8	2.8	24.6	376.8	6.5%
	2014	15.0	1.9	16.9	370.6	4.6%
Total for 2013-2014		36.8	4.8	41.5	747.4	5.6%
Alt 3	2013	22.3	2.9	25.2	352.3	7.2%
	2014	9.0	1.2	10.1	373.0	2.7%
Total for 2013-2014		31.3	4.1	35.3	725.3	4.9%
Alt 4	2013	8.3	1.1	9.4	358.0	2.6%
	2014	7.0	0.9	7.9	364.1	2.2%
Total for 2013-2014		15.3	2.0	17.3	722.1	2.4%

GB YT sub-ACL equivalent to 16% - 33.4 mt of GB YT (76.8 mt if US ABC = 495 mt)

For this alternative the total sub-ACL would be about equal to the estimate of YT catch from open areas, 33.4 mt (based on a sub-ABC of 34.4 mt), assuming a US ABC of 215 mt. Therefore, for this alternative the PDT assumed that all 2013 effort in CA2 would have to be delayed. There would still be a risk of exceeding a sub-ACL of 33.4 mt, not as great as the 8% alternative above, but still possible. Therefore, this alternative assumes that there would not be any access in CA2 in 2013 or 2014 – same as 8% alternative described above.

It is true that if Closed Area 2 is closed in 2013 and 2014, that area could be accessed in the future, but natural mortality will impact some portion of the biomass reducing potential harvest over the long-term. It is also possible that these losses from natural mortality could be offset by the growth of recruited scallops in that area. But there has not been evidence of good recruitment in CA2 for several years, so extended closures for that area will not provide large increases in future yield. Biomass in CA2 is lower than usual, so tow times may be longer than recent years, having potentially greater impacts on bycatch. Overall, the potential economic impacts are the same for this 16% allocation alternative as the 8% allocation alternative above, but this alternative has a lower risk of triggering an AM and reducing CA2 catches in 2014.

If the US ABC is 495 mt, the scallop sub-ACL under this alternative would be 76.8 mt. This level of YT catch would reduce the risk of the scallop fishery exceeding the sub-ACL and CA2 trips in 2013 could probably be allocated under Alternative 4 levels. Alternative 4 estimates 73 mt of GB YT catch, so an allocation of 76.8 mt could be sufficient to provide the level of open area and CA2 access allocated, assuming the estimates are realized. However, this YT sub-ACL amount would probably not be sufficient for Alternative 2. Alternative 2 allocated more access in CA2 and the estimated YT catch is 134 mt. If Alternative 2 is selected under FW24, and no other measures implemented to reflect the available YT catch at 76.8 mt, there would be a substantial risk of exceeding the sub-ACL.

GB YT sub-ACL equivalent to 90% of estimated catch

If the Council decides to allocate the YT sub-ACL to the scallop fishery based on 90% of the “medium” estimate that would be equivalent to 116.9 mt (based on a sub-ABC that is 90% of 134 mt, or 120.6 mt) for Alternative 2, and 63.7 mt (based on a sub-ABC that is 90% of 73 mt, or 65.7 mt) for Alternative 4. Both of these alternatives require a high percentage of the total available GB YT catch, 215 mt. An allocation of 116.9 mt for Alternative 2 is equivalent to 54% of the US TAC, and 63.7 mt for Alternative 4 is equivalent to 30% of the US TAC (Table 2). If the Council based the allocation decision on 90% of the “high” estimate that would be 209.5 mt (based on a sub-ABC that is 90% of 240 mt, or 216 mt) for Alternative 2 and 112.7 mt for Alternative 4 (based on a sub-ABC that is 90% of 129 mt, or 116.1 mt), even higher percentages of the US TAC. The 90% of estimated catch allocation alternative is the same regardless of the total US ABC. Therefore, the potential economic impacts are the same for the scallop fishery if the US ABC is 215 mt or 495 mt with this allocation alternative.

To illustrate the potential impacts of the 90% allocation alternative, it is assumed that all 2013 effort can occur in CA2, but there is a possibility that AMs would be triggered in 2014 and CA2 access would be reduced. If the overage is not very high, for example if it is 39% or less, it is possible that vessels could take trips in CA2 from May-July, assuming FW24/49 modifies the access dates to May 1-August 31 (Table 5). However, shifting landings to the other seasons would reduce the flexibility for vessel owners

to choose where and when to fish with a possible increase in fishing costs. On the other hand, shifting effort to other seasons when the meat weights are highest could benefit the scallop resource and increase landings and revenues to some extent offsetting the negative effects of the effort shifts.

If the overage is greater than 56%, however, there will be no access to CA2 and the revenues would decline by \$16.7 million with ALT-2 and \$7.7 million with Alt-4 in 2014 fishing year (Table 3) and total economic benefits would decrease by \$16.9 million with ALT-2 and \$7.9 million with ALT-4 (Table 4).

Table 5. Current GB AM schedule under Framework 23 for years when Closed Area II is open (All limited access vessels excluding IFQ vessels) and 2011 scallop catch in SA562

GB AM Schedule -CA2 open		Scallop landings in Area 562	% of Total Scallop landings in area 562
Overage	LA Closure		
3% or less	Oct-Nov	672,923	12%
3.1-14%	Sept-Nov	1,387,998	24%
14.1-16%	Sept-Jan	1,423,698	25%
16.1-39%	Aug-Jan	2,716,060	47%
39.1-56%	Jul-Jan	2,925,250	51%
Greater than 56%	All year	5,739,555	100%

Overall the 90% allocation alternative has the greatest benefit for the scallop fishery and nation because it has the lowest risk of being exceeded and potentially triggering AMs, which potentially have negative impacts on the scallop fishery. As mentioned above, in light of the very constraining GB YT ACL in 2013, the Scallop PDT developed a specific specification alternative to reduce YT bycatch upfront (Alternative 4). Alternative 4 results in a reduction of 3.8 million pounds in landings in 2013-2014 due to lower allocations in CA2 compared to ALT-2, resulting in a \$27.8 million reduction in scallop revenue (undiscounted values, Table 6) over the short-term from 2013-2014. Similarly, total economic benefits to the scallop fishery are estimated to be \$25.3 million lower (percent value of the cumulative benefits discounted at 3%) for ALT-4 compared to ALT-2 in the short term from 2013 to 2014. This is a direct impact of a potentially lower YT sub-ACL for the scallop fishery before sub-ACL alternatives are even considered. If YT catch was not a constraint, reducing 2013 catch in CA2 would probably not be a specification scenario since there are older scallops in that area that should be harvested. Alternative 4 perform slightly better than Alternative 2 in the long term with the total economic benefits exceeding that of for Alternative 2 by \$4.6 million because biomass overall is quite low in most access areas. Therefore, reducing effort overall in access areas does provide additional benefit in the long term (Table 7).

Table 6. Short-term economic impacts of ALT-4 compared to ALT-2 (2013-2014)

Fishing year	Values	ALT2	ALT4
2013	Scallop Landings (Million lb.)	38.2	36.2
	Scallop Revenue (Million \$)	393.4	373.7
	Difference of Revenue from ALT2		-19.7
	% Difference of Revenue from ALT2		-5.0%
2014	Scallop Landings (Million lb.)	38.8	38.0
	Scallop Revenue (Million \$)	396.3	388.2
	Difference of Revenue from ALT2		-8.1
	% Difference of Revenue from ALT2		-2.04%
Scallop Landings (Million lb.)		77.0	74.2
Scallop Revenue (Million \$)		789.7	762.0
Difference of Revenue from ALT2			-27.8

Table 7. Short-term versus Long-term Economic impacts of ALT-4 compared to ALT-2 (Monetary values show the cumulative present value of the benefits discounted at 3%)

Values	ALT2	ALT4
Short-term Economic Impacts: 2013-2014		
Scallop Landings (Million lb.)	77.0	74.2
Present Value of Scallop Revenue (Million \$)	755.5	728.8
Present Value of Producer Surplus (Million \$)	696.3	673.7
Present Value of Consumer Surplus (Million \$)	51.1	48.4
Present Value of Total Benefits (Million \$)	747.4	722.1
Difference of Total Benefits from ALT2		-25.3
Long-term Economic Impacts: 2013-2026		
Scallop Landings (Million lb.)	722.3	723.3
Present Value of Scallop Revenue (Million \$)	5542.1	5542.3
Present Value of Producer Surplus (Million \$)	5111.3	5113.7
Present Value of Consumer Surplus (Million \$)	489.3	491.5
Present Value of Total Benefits (Million \$)	5600.6	5605.2
Difference of Total Benefits from ALT2		4.6

SNE/MA YT sub-ACL

The Scallop PDT also estimated future SNE/MA YT catch. GF FW48 is not considering specific methods for identifying how to allocate the sub-ACL for this stock. But the Council still needs to identify what the sub-ACL is for the scallop fishery. For FW24 Alternative 2 the estimate of catch is 33 mt, and for Alternative 4 it is 32 mt, and a sub-ABC based on 90% of these values is 29.7 and 28.8 mt respectively. The PDT also prepared some sensitivity analyses for the SNE/MA YT estimates resulting in a 10 mt buffer around the median estimates, 5 mt above and 5mt below. The PDT does believe that these values could be underestimated for several reasons, primarily because the model tends to overestimate open area catch on GB compared to the MA. The total ACL for SNE/MA YT for 2013 is 653 mt.

In 2011 and 2012 the Council chose to allocate 90% of the projected catch under GF FW44. In 2011 the scallop fishery was allocated 82 mt of SNE/MA YT out of a total ACL of 641 mt, about 13% of the total. In 2012, the sub-ACL was 127 mt out of a total ACL of 936 mt, about 14% of the total. In 2011 the final estimate of realized YT catch by the scallop fishery was 111 mt., which exceeded their allocation of 82

mt. Since the total ACL was not exceeded and the fishery did not exceed by 50% AMs were not triggered. For 2012 to date (through October 24), the fishery is estimated to have caught 55 mt or about 43% of the total sub-ACL of 127 mt. It does not appear that the fishery will exceed the sub-ACL for 2012.

In 2013 open area DAS are similar to 2012 levels, and access into NL is lower; about 1,350 mt of scallops were allocated from NL in 2012, and for 2013 the catch for NL is between 0 and 662 mt depending on the specification alternative adopted. Therefore, total SNE/MA YT catch should be lower in 2013 compared to 2012 due to reduced access in NL, if bycatch rates and fishing behavior remain the same from year to year, which is uncertain. From March 2012-Sept 2012 the LA fishery has caught about 790 mt of scallops from NL. That is about 60% of the total scallop catch allocated for that area for the year, but more than the total 662 mt allocated for that area in 2013 under Alternative 2 and Alternative 4. To date, the YT catch estimate from NL is about 4 mt, the same amount projected for 2013. Therefore, if all conditions are the same the projected catch amounts should be sufficient for SNE/MA YT.

In addition, Framework 23 adjusted the AM schedule to reduce effort during months with the highest yellowtail bycatch rates. In the event that bycatch rates are higher than expected, the SNE/MA area will close in accordance with the schedule shown on Table 8. The scallop catch associated with these time periods has been provided as well. Overall, these SNE/MA closures are not expected to have large impacts on the limited access fleet given that only 4.7% of the total landings of FT limited access vessels took place in those areas. In addition, vessels can fish open area DAS in other areas outside the AM closure, if triggered. However, for a subset of vessels that fish in those areas, shifting landings to the other areas and seasons would reduce the flexibility for vessel owners to choose where and when to fish with a possible increase in fishing costs. On the other hand, shifting effort to other seasons when the meat weights are highest could benefit the scallop resource and increase landings and revenues to some extent offsetting the negative effects of the effort shifts.

Table 8. The 2009-2010 landings in closed periods for SNE/MA AM schedule (3 Digit Areas 537+539+613, All limited access vessels)

Current Schedule		Sum of scallop landings for 2009-2011 in 527+539+613	% of scallop landing in 3-digit areas 537+539+613	% of scallop landings from all areas during the closure period	% of all scallop landings from all areas during the whole year
Overage	LA Closure				
2% or less	March-Apr	1,490,345	21.3%	4.3%	0.9%
2.1-3%	Feb-Apr	1,917,766	24.6%	4.8%	1.2%
3.1-7%	Feb-May	3,361,956	39.2%	5.3%	2.1%
7.1-9%	Jan-May	3,451,850	42.2%	5.1%	2.1%
9.1-12%	Dec-May	3,502,035	45.6%	4.8%	2.2%
12.1-15%	Dec-June	4,827,906	58.9%	5.1%	3.0%
15.1-16%	Nov-June	4,991,420	63.6%	4.9%	3.1%
16.1-18%	Nov-July	5,349,342	74.6%	4.5%	3.3%
18.1-19%	Oct-Aug	6,734,065	91.9%	4.6%	4.2%
19.1% or more	All year	7,497,071	100.0%	4.7%	4.7%

Other considerations

The Scallop PDT does caution that the YT catch estimates are point estimates, thus are uncertain. While the 90% allocation alternative provides the most YT for the scallop fishery in this particular case, there are many variables that change from year to year, so allocating less than the estimated value could lead to increased risks of exceeding the sub-ACL.