



New England Fishery Management Council

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C.M. "Rip" Cunningham, *Chairman* | Paul J. Howard, *Executive Director*

MEMORANDUM

DATE: October 23, 2012
TO: Scallop and Groundfish Committees
FROM: Scallop Plan Development Team (PDT)
SUBJECT: **Preliminary estimates of YT catch for the Framework 24 scallop specification alternatives under consideration (version 2)**

The Scallop PDT reviewed preliminary estimates of YT catch for 2013-2015 at a PDT meeting on October 9, 2012. Framework 24 is setting specifications for FY2013-FY2014, with default measures for 2015. The Council may decide to make this an annual specification package (FY2013 only with default measures for FY2014), but the action is considering both.

Yellowtail Bycatch Estimate Method

The estimate of YT catch uses the same method used in the past, which has three basic steps. First a discard to kept ratio (D:K) is estimated from the most recent observer data available. This estimate includes a D:K ratio for all GB access areas (CA1, CA2, and NL) using all 2012 observed trips to date (March-August only). For open areas and scallop access areas in the Mid-Atlantic the overall D:K ratio was calculated using all observed trips in 2011 (March 2011-Feb 2012). Second, a projection of YT biomass for 2013-2015 is needed. That information comes from the most recent stock assessments for both SNE/MA and GB YT flounder. Finally, projections of area specific scallop biomass are used for 2013-2015 from the SAMS model. These three elements are combined into the formula below:

$$\text{Pred. YT D:K} = \text{Obs. D:K} * \frac{\text{ScallopEBms}_{\text{baseyear}}}{\text{ScallopEBms}_{\text{projyear}}} \frac{\text{YTBms}_{\text{projyear}}}{\text{YTBms}_{\text{baseyear}}}$$

Scallop Access Area Alternatives

There are a range of possible scallop fishery specifications under consideration, No Action as well as four other alternatives. All of the alternatives include a closure of Elephant Trunk in 2013 and 2014, Delmarva closure in 2013 and access in 2014, closure of Hudson Canyon in 2014 and 2015, and 33 open area DAS in 2013 and 31 in 2014. The only variation among the alternatives is the level of effort in GB access areas in terms of the number of trips and which areas are open. Table 1 below summarizes the various alternatives. Alternative 4 was specifically developed to reduce YT bycatch after the Scallop PDT reviewed preliminary estimates of YT catch for the scallop fishery. Alternative 4 reduces the level of access in CA2 by more than 50% compared to Alternative 2.

Table 1 – Summary of FW24 fishery specification alternatives

	Description of Alternative	Total AA catch per FT vessel
Alt 1	2013: Two 13,000 pound trips in CA1, CA2, and HC 2014: Two 15,000 pound trips in CA2, NL and DMV	26,000 30,000
Alt 2 (spread AA effort out)	2013: Two 13,000 pound trips in CA1, CA2, NL, and HC 2014: Two 15,000 pound trips in CA2, NL and DMV	26,000 30,000
Alt 3 (No CA1 effort)	2013: One 18,000 pound trip in CA2 and HC 2014: Two 15,000 pound trips in CA2, NL and DMV	18,000 30,000
Alt 4 (Low YT catch)	2013: One 18,000 pound trip in CA1, CA2, NL, and HC 2014: Two 13,500 pound trips in in CA2, NL and DMV	18,000 27,000
No Action	2013: Four 18,000 trips in CA2, NL, HC and DMV 2014: Four 18,000 trips in CA2, NL, HC and DMV	72,000 72,000

Estimates of YT catch

All of these specification alternatives have a different estimate of YT catch as a function of the various alternatives that differentially partition effort in the GB access areas. For all of the estimates the same assumption was used for open area catch, which is a function of the exploitable biomass in open areas. In general, the estimate of YT bycatch is positively correlated to amount of effort in CA2 (i.e. the more access to CA2, the greater the estimate of GB YT catch). Table 2 is a summary of the YT catch estimates.

Table 2 –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
GBOp	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*	103%		82%		62%		67%		34%	

* Assuming US ACL equivalent to 215 mt

The projections of SNE/MA YT catch do not seem to be an issue for 2013 and 2014 in terms of what is available to the fishery. The range of 2013 catch estimated from the specification alternatives under consideration is 28-39 mt. FW48 does not specify how the allocation will be determined, so the GF Committee will need to specify a value for FW48, but not based on a particular method. In 2011 the scallop fishery was allocated 82 mt of SNE/MA YT, and 127 mt in 2012.

Table 3 –Summary of SNE/MA YT catch estimates for the various scallop specification alternatives (2013-2014)

SNE/MA YT		2013	2014	2015
Alt 1	SNEMAOp	28	27	27
	NLS	0	11	8
	HCS	0	0	0
	ET	0	0	1
	SNEMATOT	28	38	35
		2013	2014	2015
Alt 2	SNEMAOp	28	27	27
	NLS	4	12	9
	HCS	0	0	0
	ET	0	0	1
	SNEMATOT	33	38	36
		2013	2014	2015
Alt 3	SNEMAOp	28	27	27
	NLS	0	11	10
	HCS	0	0	0
	ET	0	0	1
	SNEMATOT	28	38	37
		2013	2014	2015
Alt4	SNEMAOp	28	27	27
	NLS	4	12	8
	HCS	0	0	0
	ET	0	0	1
	SNEMATOT	32	39	36
		2013	2014	2015
NoAction	SNEMAOp	23	21	22
	NLS	15	16	21
	HCS	0	1	1
	ET	1	1	1
	SNEMATOT	39	39	45

Scallop PDT Discussion

The Scallop PDT discussed possible preferred alternatives for FW24 specifications. Overall, all the scenarios have similar impacts on scallop biomass and revenue. Alternative 2 minimizes losses in the short term (2013-2015) compared to the other alternatives (Table 3). Alternative 2 and Alternative 4 have essentially the same long-term revenues, both slightly higher than the other alternatives under consideration (Table 3). Alternative 2 provides more catch in 2013, (about 8,000 more pounds per full-time vessel, or 2.5 million pounds overall), and that makes that alternative attractive since the fishery is facing substantial reductions in 2013 compared to recent catch levels. Total revenue for Alternative 2 in 2013 is \$393 million dollars, compared to \$374 million dollars for Alternative 4.

However, due to the very low GB YT available in 2013 (500 mt total and 215 mt for the US share), the PDT supports that Alternative 4 may be the most realistic alternative when other issues are taken into consideration like YT bycatch. Alternative 4 projects 73 mt of GB YT catch, 40% less YT than Alternative 2 (134 mt). Seventy-three metric tons of GB YT is about 34% of the total US TAC of 215 mt. It is possible that GF FW48 will recommend the total GB YT TAC be above 500 mt, i.e. 1,150 mt, but these analyses assume the total US TAC is 215 mt. Alternative 4 has higher possession limits (18,000 pounds), which may not be ideal with lower scallop biomass levels in access areas, but Alternative 4 has the lowest YT catch and is preferable to Alternative 3 because it spreads effort into more access areas. Finally, Alternative 4 does have the highest long term net economic benefits to the nation when other factors are considered like trip costs and consumer benefits, 81 million dollars more than No Action (Table 4).

Table 4. Scallop Revenue by Fishyear (Million \$, in 2011 constant prices)

subperiod	Fishing year	No Action	Status quo	ALT1	ALT2	ALT3	ALT4
2013-2015	2013	448.4	505.0	393.5	393.4	368.9	373.7
	2014	434.9	488.1	395.0	396.3	398.1	388.2
	2015	470.9	508.0	440.5	445.5	452.6	458.2
2013-2015 Total		1,354.2	1,501.2	1,228.9	1,235.3	1,219.6	1,220.2
2016-2018	2016	502.2	452.1	488.0	492.2	489.8	500.1
	2017	499.5	460.1	507.3	506.2	510.3	516.2
	2018	523.9	475.0	504.2	509.5	504.4	514.5
2016-2018 Total		1,525.7	1,387.2	1,499.5	1,507.9	1,504.5	1,530.8
2019-2026	2019	485.9	486.0	534.9	548.7	532.7	553.0
	2020	486.8	493.9	533.8	541.6	528.8	545.1
	2021	490.8	497.6	525.0	531.5	520.9	530.2
	2022	495.5	500.6	520.2	522.8	515.9	518.7
	2023	498.2	505.0	516.6	514.6	511.3	510.9
	2024	498.2	506.2	514.4	508.3	508.1	507.9
	2025	500.3	506.1	513.3	506.8	506.5	505.5
2026	501.2	504.2	510.6	506.3	506.2	502.1	
2019-2026 Total		3,957.1	3,999.5	4,168.7	4,180.6	4,130.4	4,173.3
Grand Total		6,837.0	6,887.9	6,897.2	6,923.8	6,854.5	6,924.3

Table 5. Cost and Benefits for Alternative Scenarios Net of No Action Values (\$ Million, Cumulative present values discounted at 3%)

subperiod	Values	ALT1	ALT2	ALT3	ALT4	Status quo
2013-2015	Total revenue	-112.0	-106.5	-121.2	-120.7	131.1
	Total trip Costs	-26.7	-27.6	-28.8	-31.0	16.6
	Total producer Surplus	-85.3	-78.9	-92.4	-89.8	114.5
	Total Consumer Surplus	-10.8	-10.4	-11.2	-11.6	18.5
	Total benefits	-96.1	-89.2	-103.6	-101.4	133.0
2016-2018	Total revenue	-21.2	-14.4	-17.1	4.4	-112.7
	Total trip Costs	-3.9	-3.8	-3.7	-2.6	-7.3
	Total producer Surplus	-17.3	-10.6	-13.4	6.9	-105.4
	Total Consumer Surplus	-2.7	-1.7	-2.2	1.4	-19.1
	Total benefits	-20.0	-12.3	-15.5	8.3	-124.5
2019-2026	Total revenue	151.8	162.5	125.6	158.3	29.2
	Total trip Costs	9.3	9.7	7.7	9.7	2.0
	Total producer Surplus	142.5	152.9	117.9	148.6	27.2
	Total Consumer Surplus	24.3	25.1	19.4	25.3	4.1
	Total benefits	166.9	178.0	137.3	173.9	31.3
Total revenue		18.7	41.7	-12.7	41.9	47.6
Total trip Costs		-21.3	-21.7	-24.8	-23.8	11.3
Total producer Surplus		40.0	63.5	12.1	65.8	36.4
Total Consumer Surplus		10.7	13.0	6.0	15.0	3.5
Total benefits		50.7	76.5	18.2	80.8	39.9

Groundfish Framework 48 is considering two alternatives for allocating the GB YT sub-ACL. The first alternative is a range of 8-16% of the total ACL. For 2013 that is equivalent to 16.7 mt to 33.4 mt. The second alternative is 90% of the projected catch estimate. For Alternative 2 that would be 116.9 mt (97% of 90% of 134 mt), and for Alternative 4 that is equivalent to 63.7 mt (97% of 90% of 73 mt). Both of these alternatives are a high percentage of the total available GB YT catch; an allocation of 120.6 mt for Alternative 2 is equivalent to 54% of the US TAC, and 65.7 mt for Alternative 4 is equivalent to 30% of the US TAC (Table 2). The FW24 scallop specification alternatives are already 30% lower than recent catch levels; therefore, if further reductions are needed to reduce YT catch (i.e. Alternative 4 compared to Alternative 2), there will be additional short-term losses to the scallop fishery.

The Scallop PDT does caution that these are point estimates and are more likely underestimates for several important reasons. First, the bycatch rate for GB access areas uses 2012 observed trips from June 15 –August only. This rate will likely increase once observed trips from the fall are included because bycatch rates are typically higher in CA2 during the fall compared to the spring and summer. Many of the access areas are getting fished out, and as scallop biomass declines, YT bycatch rates may increase due to increases in towing time. Therefore, bycatch rates from 2011 and 2012 used in these analyses could be lower than the realized rates will be in 2013 and 2014. On the other hand, these could be overestimates if vessels fish less open area DAS on GB. The model assumes that 20% of open area

effort will occur on GB. In addition, the YT biomass estimates could be higher than realized, thus bycatch rates could be lower.

In order to capture some of this uncertainty the Scallop PDT prepared some sensitivity analyses for the YT catch estimates provided above. A similar analysis was prepared earlier this year when the Council and NMFS considered shifting some 2012 GB YT sub-ACL to the GF fishery from the scallop fishery. This sensitivity analysis only accounts for the uncertainty related to projected scallop and YT biomass in 2013-2015. The "Medium" estimate uses the median biomass estimate for both scallops and YT for 2013-2015. The "Low" estimate uses the 10th percentile for YT biomass combined with the 90th percentile for scallop biomass. The "High" estimate uses the 90th percentile for YT combined with the 10th percentile for scallop biomass. For example, for Alternative 4 the medium estimate of GB YT catch is 73 mt; the low is 35 mt and the high is 129 mt (Table 5). This range still does not take into account variation in scallop fishing behavior in terms of when and where vessels will fish open area DAS or whether the D:K ratio used from 2011/2012 observer data will be reflective of D:K ratios in 2013-2015. Those additional sources of uncertainty would impact realized YT catch as well.

In summary, these estimates are very uncertain. On top of that, one alternative in Framework 48 will allocate 90% of the estimated catch as an incentive to further reduce YT bycatch. The Scallop PDT is concerned that while this allocation method may provide incentive to reduce YT bycatch, there are many variables that change from year to year, so allocating less than the estimated catch level could lead to increased risks of exceeding the sub-ACL. However, there is also a provision that AMs in the scallop fishery do not trigger unless the total US ACL has been exceeded, or the scallop fishery exceeds their ACL by 50%. Those provisions reduce the chance that AMs will trigger, but managers should be aware that setting the initial allocation at 90% of the estimated catch level potentially increases the likelihood that the scallop fishery will exceed their sub-ACL every year.

The PDT also prepared some sensitivity analyses for the SNE/MA YT estimates. In this case the PDT did not run separate projections using different estimates of biomass. Instead a more simple approach as used to highlight the uncertainty related to the estimate of open area effort that will occur in the SNE/MA YT stock area, compared to other areas. Specifically, the projections estimate that 50% of all open area catch will occur in the SNE/MA YT stock area, but the fleet dynamic methods used in the estimates are relatively crude. The model could be underestimating the level of MA effort because some vessels are not able to fish in certain hard bottom areas like the Channel, some will not travel as far to fish open area DAS, and fishing in the MA in the winter is more favorable than on GB. On the other hand, 50% of open area effort could be an overestimate, so the PDT has added a 10% bound to the estimate of YT catch from open areas in SNE/MA (Table 7).

Table 6 – Summary of GB YT catch estimates (Low, medium and high)

	No Action		Alt1		Alt2		Alt3		Alt4	
LOW										
	2013	2014	2013	2014	2013	2014	2013	2014	2013	2014
GBOp	14	18	17	23	17	23	17	23	17	23
CL1	0	0	1	0	1	0	0	0	1	0
CL2	92	146	59	47	46	87	52	68	18	29
Total	105	165	77	70	64	109	70	90	35	52
MEDIUM										
	2013	2014	2013	2014	2013	2014	2013	2014	2013	2014
GBOp	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
HIGH										
	2013	2014	2013	2014	2013	2014	2013	2014	2013	2014
GBOp	47	55	59	67	59	67	59	67	59	67
CL1	0	0	4	0	3	0	0	0	3	0
CL2	353	501	257	318	178	297	202	231	67	99
Total	400	556	319	385	240	364	260	299	129	166

Table 7 – Summary of SNE/MA YT catch estimates (Low, Medium, High)

LOW		2013	2014	2015	MEDIUM		2013	2014	2015	HIGH		2013	2014	2015
Alt 1	SNEMAOp	22	21	21	Alt 1	SNEMAOp	28	27	27	Alt 1	SNEMAOp	34	32	32
	NLS	0	11	8		NLS	0	11	8		NLS	0	11	8
	HCS	0	0	0		HCS	0	0	0		HCS	0	0	0
	ET	0	0	1		ET	0	0	1		ET	0	0	1
	SNEMATOT	23	33	30		SNEMATOT	28	38	35		SNEMATOT	34	43	41
		2013	2014	2015			2013	2014	2015			2013	2014	2015
Alt 2	SNEMAOp	22	21	21	Alt 2	SNEMAOp	28	27	27	Alt 2	SNEMAOp	34	32	32
	NLS	4	12	9		NLS	4	12	9		NLS	4	12	9
	HCS	0	0	0		HCS	0	0	0		HCS	0	0	0
	ET	0	0	1		ET	0	0	1		ET	0	0	1
	SNEMATOT	27	33	31		SNEMATOT	33	38	36		SNEMATOT	38	43	41
		2013	2014	2015			2013	2014	2015			2013	2014	2015
Alt 3	SNEMAOp	22	21	21	Alt 3	SNEMAOp	28	27	27	Alt 3	SNEMAOp	34	32	32
	NLS	0	11	10		NLS	0	11	10		NLS	0	11	10
	HCS	0	0	0		HCS	0	0	0		HCS	0	0	0
	ET	0	0	1		ET	0	0	1		ET	0	0	1
	SNEMATOT	23	33	32		SNEMATOT	28	38	37		SNEMATOT	34	43	42
		2013	2014	2015			2013	2014	2015			2013	2014	2015
Alt4	SNEMAOp	22	21	21	Alt4	SNEMAOp	28	27	27	Alt4	SNEMAOp	34	32	32
	NLS	4	12	8		NLS	4	12	8		NLS	4	12	8
	HCS	0	0	0		HCS	0	0	0		HCS	0	0	0
	ET	0	0	1		ET	0	0	1		ET	0	0	1
	SNEMATOT	27	33	30		SNEMATOT	32	39	36		SNEMATOT	38	44	41
		2013	2014	2015			2013	2014	2015			2013	2014	2015
NoAction	SNEMAOp	18	17	17	NoAction	SNEMAOp	23	21	22	NoAction	SNEMAOp	27	26	26
	NLS	15	16	21		NLS	15	16	21		NLS	15	16	21
	HCS	0	1	1		HCS	0	1	1		HCS	0	1	1
	ET	1	1	1		ET	1	1	1		ET	1	1	1
	SNEMATOT	34	35	40		SNEMATOT	39	39	45		SNEMATOT	43	43	49



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MEMORANDUM

DATE: October 25, 2012
TO: Scallop and Groundfish Committees
FROM: Scallop Plan Development Team (PDT)
SUBJECT: **Input on bycatch of windowpane and CC/GOM YT catch in the scallop fishery**

Groundfish FW48 is considering specifications for FY 2013-2015 including additional sub-ACLs for the scallop fishery. Currently the scallop fishery has two sub-ACLs from the Multispecies FMP: GB and SNE/MA YT flounder. This action is considering a sub-ACL for southern windowpane as well. As the GF PDT developed ACL recommendations for all species it requested input from the Scallop PDT related to several species with relatively higher catches from the scallop fishery. Specifically, the species that were identified were: GB YT, SNE/MA YT, northern and southern windowpane flounder and CC/GOM YT flounder. The last species was included not because the scallop fishery catches a large percent of the total catch, but because more open area scallop fishing effort is expected within the CC/GOM YT stock area compared to previous years based on scallop biomass levels.

Windowpane Flounder

The Scallop PDT estimated the catch of both northern and southern windowpane flounder in 2013-2015. The method used to estimate WP catches is similar to that used for YT, except there is no windowpane projection available, so the biomass for these stocks is assumed to remain the same. Neither of these stocks have projected biomass estimates, so the NEFSC trawl survey indices are used as proxies for biomass from the most recent assessments. The biomass is assumed to remain the same for the time period of the estimates. D:K ratios calculated using 2011 observer data for all areas, and 2010 for NL.

In 2011 the estimate of WP catch in the scallop fishery was 33 mt of N windowpane, and 135.3 mt of S windowpane. In 2011 there were 32 open area DAS and 4 access area trips (1.5 in CA1, 0.5 in CA2, and

one in Delmarva and one in Hudson Canyon). The estimates of WP catch for 2013 under Alternative 4 in FW24 (33 open area DAS and 1 trip per vessel split between CA1, CA2, HC and NL) are 50 mt for N windowpane and 50.8 mt for S windowpane (Table 1). Alternative 2 estimates a bit more WP catch, due to higher access area allocations in GB access areas (CA1, CA2 and NL). Otherwise, the projections of catch are very similar for these two alternatives. These estimates are based on an assumption that 50% of open area effort will occur in the N Windowpane stock area and 50% will occur in the S Windowpane stock area, which is what the scallop fishery projection model assumes (50% in MA and 50% on GB and GOM).

Table 1 – Estimates of windowpane catch in 2013 and 2014 for Alternative 2 and Alternative 4

	Alt 2		Alt 4	
	2013	2014	2013	2014
Open North	29.9	27.5	29.9	27.5
CL1	22.4	0.0	20.1	0.0
CL2	3.3	4.3	1.3	1.4
Total North	55.6	31.8	50.0	27.5
SNELIOp	39.1	40.1	39.1	40.1
Open South	5.5	5.0	5.5	5.0
NLS	6.0	15.4	5.6	16.0
HCS	0.6	0.0	0.5	0.0
DMV	0.0	0.1	0.0	0.1
Total South	51.2	60.6	50.8	61.2

Currently in FW48 the allocation for “other subcomponent” catch for N windowpane is 44 mt (out of total ACL of 144). Therefore, scallop fishery catch could exceed the amount set aside for other subcomponent catch if the projected catch is realized by the scallop fishery.

For southern windowpane flounder, in 2011 the scallop fishery caught 135.3 mt, out of a total 400.5 mt caught by other sub-component fisheries. FW48 is considering allocating a sub-ACL to the scallop fishery for this stock because in some years the catch from the scallop fishery is large enough that the effectiveness of the AM could be undermined if catches by the scallop fishery are not subject to an AM. The GF FMP has an AM for the GF fishery, but there is no AM for the fisheries under the “other sub-component” catch.

If the Council does NOT give a sub-ACL to the scallop fishery it looks like the allocation will be 384 mt for all “other subcomponent catch”. That is similar to the 2011 allocation and the scallop fishery may catch less than 2011 levels. Therefore, that allocation may work and reduced risks of being exceeded due to

large increases in catch from the scallop fishery. If the scallop fishery is given a sub-ACL, FW48 sets the allocation at 36%, equal to 186 mt for 2013. That is higher than the level caught in 2011 (135.3 mt) and more than the fishery is estimated to catch in 2013 (51 mt)(Table 1). With the southern windowpane stock where it is, 36% of the total does not seem to be a constraining factor for the scallop fishery based on current estimates of southern windowpane bycatch.

CC/GOM YT flounder

The projections for the scallop fishery estimate that about 50% of open area effort will occur in the MA YT stock area, 20% on GB and 30% in the CC/GOM stock area. Scallop biomass within the CC/GOM YT stock area is higher and more fishing is expected there compared to the last few years. In 2011 about 2,100 mt of scallop meats landed from the CC/GOM stock area, but some of that catch from CA1 trips. About 25% of Closed Area I trips are typically removed from the CC/GOM area and 75% from GB. In 2011, 1.5 trips were allocated to CA1 so 25% of that is about 1,000 mt. If that is removed from the total CC/GOM catch, about 1,100 mt remains that were likely harvested from open areas within CC/GOM.

Open area catch is expected to increase in 2013 compared to 2011, so doubling the catch from 1,100 to 2,200 is probably a reasonable estimate of scallop catch from open areas within the CC/GOM YT stock area. Following this rationale, the Scallop PDT recommends that the GF PDT consider taking the scallop catch of CC/GOM YT from 2011 and doubling that catch for the estimate of CC/GOM YT catch by the scallop fishery in 2013. That amount should be incorporated in the overall catch set aside for the “other subcomponent catch of CC/GOM YT catch.



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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.