

Possible combination of RPM measures to further comply with ESA

Based on discussions at the Scallop Committee meeting there may be interest on the Council to consider a combination of RPM measures in addition to the Committee recommendation for a preferred alternative. The Committee motion and discussion is below as well as potential options for combined RPM alternatives that would further limit effort in the Mid-Atlantic during the time of year turtles are likely to be present. Staff was asked by the Executive Director to provide additional alternatives and analyses that would combine existing FW21 RPM alternatives so that effort is further limited in the Mid-Atlantic in the event the Council may want to consider a combination of measures to further comply with ESA.

Motion 1: Robins/Preble

Identify Option 2.7.1.3 Option A (Seasonal closure of Delmarva in Sept and Oct) as preferred alternative in FW21.

Vote: 9:0:0, motion passes unanimously.

Rationale/discussion: This option was identified as preferred because the maker of the motion expressed concerns about equitability and distributional impacts of the other RPM alternatives. This alternative has more even impacts since all vessels are allocated one Delmarva trip. Southern boats would be impacted much more compared to vessels from the north if effort was constrained (DAS limit of AA limit) during the summer/fall.

It was also pointed out that for the status quo option the analyses suggest that this seasonal closure is expected to impact about 10% of the total effort that takes place in the MA during the turtle season, and that was identified as a reasonable amount of effort to impact under the requirements of ESA. Furthermore, it was pointed out that these estimates are based on assumed fishing behavior responses and historical fishing patterns, so impacts could be very different if the fishery responds differently than assumed. Specifically, if effort shift mostly to November and December than impacts on F will actually be higher than the results suggest, having more than minor impacts on F and ultimately the fishery from increased mortality. However, if effort shifts only to the summer impacts on F will be reduced more than the model results suggest. Therefore, several commented that 10% seems to be a reasonable level of effort shift to use as a standard since actual impacts could be higher or lower. Since these impacts are difficult to predict, implementing something that could have the potential to have much higher impacts on F due to effort shifting into seasons with lower meat weight yields is risky and could have more than minor impacts on F and the fishery. Therefore, the Committee was comfortable with considering measures that have an estimated impact on effort shift of about 10%. Others added that shifting 10% of effort from that area and season should have beneficial impacts on turtles.

It was discussed that the other options may essentially impact 100% of effort in that area and season because any reduction from the historical average is less than a normal trip length. One member pointed out that shifting 18% to 23.9% of effort caused by alternatives 1 and 2, is too high.

It was discussed that this alternative is the only option with beneficial impacts excepted for the fishery. Some voiced that a win/win situation should not be viewed as a negative thing. NMFS acknowledged that the Delmarva seasonal closure would provide some benefit, but expressed concern that the action needs to minimize takes (in this case by limiting effort) up to point that would not have more than minor impact on the fishery, and it was unclear how the Delmarva seasonal closure would minimize takes up to a more than minor impact threshold. As the impact on the fishery would be positive, it would seem that the action could do more to minimize takes before approaching the more than minor threshold. A member of the audience added that this alternative focuses only on Delmarva, and other areas in the MA are not addressed directly by this measure. Another noted that the combination of this closure and the ETA closure will provide a large continuous corridor for turtle protection for two months during their normal migration period and that should have beneficial impacts. It was also pointed out that this FW is only for one year, so additional RPM measures could be developed in future actions since the RPM requirement will remain in place until something else supersedes it such as a new biological opinion.

Does the measure have to minimize the *extent* or the *impact* of takes? The answer provided by NMFS is that RPMs have to do both. Not every RPM has to do both; this RPM happens to focus on reducing the extent or number of takes.

Does the Council agree with the Committee that RPM Alternative #3 is sufficient in meeting the threshold required by ESA? Or does the Council want to consider an additional measure that would further limit effort in the Mid-Atlantic up to a point that would not have more than a minor impact?

1.1 COMBINATION OF DELMARVA SEASONAL CLOSURE IN SEPTEMBER AND OCTOBER AS WELL AS REDUCED POSSESSION LIMIT ON ANY ACCESS AREA TRIP IN ELEPHANT TRUNK AND/OR DELMARVA FROM JUNE 15 THROUGH AUGUST 31

This alternative is somewhat of a combination of RPM Alternative #3 Option B and RPM Alternative #4 in the current FW21 Draft EA. As Alternative #3 explains no vessels (LA and LAGC) would be permitted to fish in Delmarva from September 1 through October 31. In addition, limited access vessels that decide to use either of their two ETA access area trips (Option A) or their Delmarva trip (Option B) from June 15-August 31 would be permitted to do so, but the possession limit would be reduced. This alternative is different than Alternative #4 in that vessels would be permitted to take a subsequent trip outside the turtle season to recoup the difference on reduced possession limit during the turtle season. One or more subsequent trips could be taken from November 1, 2010 -February 29, 2011. Under Option A – Delmarva trips could be taken anytime outside of Sept-Oct closure, and possession limit would remain the same. Under Option B – both ETA and Delmarva trips taken during June15-Aug 31 would be subject to reduced possession limit.

For full-time vessels, they would be permitted to take one or both ETA access area trips with a 12,000 pound possession limit. If they decide to take one, they would be permitted to take two additional trips in ETA outside the turtle season. Those two additional trips would have a possession limit of 12,000 pounds each. Current broken trip provisions would still apply, so vessels could return to ETA outside the turtle season on more than two occasions if necessary. If that vessel decided to take two ETA trips from June 15-August 31 at 12,000 pounds each, they would only be permitted to take one additional trip with a 12,000 pound possession limit. Again, current broken trip provisions would still apply, so vessels could return to ETA outside the turtle season on more than one occasion if necessary.

As for the Delmarva area, vessels would be permitted to take one Delmarva trip at a reduced possession limit of 9,000 pounds for full-time permits during the turtle season. If a vessel decided to take a reduced trip in Delmarva from June 15-August 31 at 9,000 pounds each, they would only be permitted to take one additional trip with a 9,000 pound possession limit outside the turtle season. Again, current broken trip provisions would still apply, so vessels could return to Delmarva outside the turtle season on more than one occasion if necessary.

Rationale: This alternative is intended to limit scallop fishing in the Mid-Atlantic during the turtle season two ways: prohibit vessels from taking trips in Delmarva in September and October completely, and limiting effort in Elephant Trunk and or Delmarva from June 15-August 31 by reducing the possession limit of those trips, which is likely to reduce the number of total access area trips taken during that season as well as reduce trip length of trips that do fish in that area by reducing the possession limit to 12,000 pounds and 9,000 pounds respectively.

Issues/Concerns: This alternative would have higher impacts on costs compared to other alternatives described below and in FW21 already because it includes an additional trip with added costs of steaming time etc. On the other hand, this alternative could discourage some vessels to fish during the turtle closure season at all, thus higher costs from additional trips could be lower than presented. This alternative may have lower impacts on fishing mortality because it is expected that some vessels will still choose to fish in the summer/early fall when meat weights are higher. However, if the reduced possession limit and need to take an additional trip changes behavior so that fewer vessels fish in the higher meat weight period, fishing mortality will increase as a result of more effort in the other season when meat weights are lower overall. The 9,000 possession limit in Delmarva is a concern. This amount may be too low to warrant steam time and trip costs for some vessels, particularly ones that live farther from this fishing area. Therefore, this restriction may reduce expected effort even more than the model projects.

1.2 COMBINATION OF DELMARVA SEASONAL CLOSURE IN SEPTEMBER AND OCTOBER AS WELL AS A LIMITING THE NUMBER OF ACCESS AREA TRIPS THAT CAN BE TAKEN IN ELEPHANT TRUNK WITH A REDUCED POSSESSION LIMIT IF TRIP TAKEN BETWEEN JUNE 15 THROUGH AUGUST 31

This alternative is somewhat of a combination of RPM Alternative #3 Option B and RPM Alternative #4 in the current FW21 Draft EA. As Alternative #3 explains no vessels (LA and LAGC) would be permitted to fish in Delmarva from September 1 through October 31. In addition, limited access vessels that decide to use either of their two ETA access area trips from June 15-August 31 would be permitted to do so, but the possession limit would be reduced to 14,000 pounds for full-time vessels, and by similar amount for other permit categories. This alternative is different than Alternative #4 in that vessels would be permitted to harvest the difference of possession limit on their other ETA trip outside of the turtle season (from March 1- June 14 or November 1 – February 29).

Specifically, a vessel that decides to take their one trip permitted during the turtle season can do so at a reduced possession limit of 14,000 pounds. Then on a subsequent trip they can fish up to the possession limit for the second trip (18,000 pounds for full-time vessel) plus the difference from their trip during the turtle season of 4,000 pounds, for a total possession limit of 22,000 pounds on their trip outside the turtle window. Vessels do not have to fish during the turtle season, and if they decide not to would be limited to current possession limits of 18,000 pounds for each ETA trip.

Rationale: This alternative is intended to limit scallop fishing in the Mid-Atlantic during the turtle season two ways: prohibit vessels from taking trips in Delmarva in September and October completely, and limiting effort in Elephant Trunk from June 15-August 31 by implementing a one trip maximum per vessel with a reduced possession limit to further reduce incentive to fish during the turtle season. These measures are likely to reduce the number of total access area trips taken during that season as well as reduce trip length of trips that do fish in that area by reducing the possession limit to 14,000 pounds.

Issues/Concerns: This alternative is more restrictive than that 1.3 because it includes a one trip maximum and imposes a reduced possession limit during the turtle window. It has lower impacts on costs than alternative 1.1 because it does not include a provision for an additional trip – which has additional costs.

1.3 COMBINATION OF DELMARVA SEASONAL CLOSURE IN SEPTEMBER AND OCTOBER AS WELL AS A RESTRICTION ON THE NUMBER OF ACCESS AREA TRIPS IN THE MID-ATLANTIC THAT CAN BE USED DURING JUNE 15 THROUGH AUGUST 31

This alternative is a combination of RPM Alternative #3 Option B and RPM Alternative #2 in the current FW21 Draft EA. As Alternative #3 explains no vessels (LA and LAGC) would be permitted to fish in Delmarva from September 1 through October 31. In addition, limited access vessels would be limited to either one (Option A) or two (Option B) total Mid-Atlantic access area trips from June 15-August 31, assuming both Delmarva and ETA closed for the months of September and October already. Vessels are allocated a total of three MA access area trips in 2010: 2 in ETA and 1 in Delmarva. This combined measure would limit vessels to using either one or two of their three allocated trips from June 15-August 31. No trips would be permitted in either area from September 1 – October 31. There would be no change in the possession limit for trips taken during the turtle season and current broken trip provisions would apply to all trips taken during and outside of the turtle season.

Rationale: This alternative is intended to limit scallop fishing in the Mid-Atlantic during the turtle season two ways: prohibit vessels from taking trips in Delmarva in September and October completely, and limiting effort in both Elephant Trunk and Delmarva from June 15-August 31 by implementing a maximum number of trips individual vessels can take during that time period (either one or two trips of the total three allocated). The second part of this alternative will limit the total number of trips able to be taken during the time of year when turtles are present. In the past there have been some vessels that use two or more of their total allocated MA AA trips from June-October, so limiting the total amount of trips to two will reduce the total number of trips that can take place in those areas during the turtle season. An equivalent of 1020 full-time MA AA trips will be allocated in 2010. This alternative would limit the number of possible access area trips that could be taken during the turtle season to 340 or 680 depending on the option selected.

1.4 PRELIMINARY ANALYSES OF THESE COMBINED ALTERNATIVES

1.4.1 Combination of Delmarva closure in Sept. and Oct. and reduced possession limit in ETA (Option A) and/or DMV (Option B) from June 15 though August 31

Status Quo Assumptions: Moving effort from June 15 to Aug. 31 is estimated to reduce meat weight by 7.9%. We calculated that 21.9% of the Mid-Atlantic access area effort took place during this time period and the rest, 78.4% took place outside of the Turtle window. Applying the same % distribution of effort to 1020 trips (3 access area trips per 340 FT equivalent vessel) that will be allocated for the 2010 fishing year, we estimated that about 220 trips will take place during this window, totaling 3.96 million lb. Furthermore, we assumed that 21.6% of the Delmarva trips take place during this time period, totaling 73 (340×0.216) trips and totaling 1.32 million lb. at a possession limit of 18,000. There will be about 147 trips to ETA totaling 2.64 million lb.

1.4.1.1 Option A (ETA reduced poss limit only)

There will be no reduction in possession limit for DMV trips, therefore the projection expect there will still be 73 trips to this area during the window June 15 to Aug. 31. The possession limit for ETA trips will be reduced to 12,000 lb. however. Assuming that the same number of ETA trips, i.e., 147 trips will be taken at 12,000 lb. each, total landings from this area will decline to 1.76 million lb. and total landings from Mid.Atl. access areas including DMV will decline to 3.08 million lb. during this window. This is equivalent to a 22% reduction in landings and effort as measured by DAS-used during the turtle window. Total DAS-used estimated by dividing total landings by the LPUE. Status quo DAS-used is estimated to be 1854 DAS, which is expected to decline to 1442 DAS, or by 412 DAS during the window.

Moving this effort and landings from the turtle window to the rest of the year is about a 5.4% effort shift. If the possession limit stays at 12,000 lb. and there is no reduction in total landings from the DMV and ETA areas for the year, the fishing mortality is estimated to increase by 0.005. There would be no loss in scallop revenue because the vessels will be allowed to land the same amount of pounds. Because the number of trips would increase for people that take their trips in the summer period, however, there will be an increase in fishing costs. As indicated above, 147 trips are expected to be taken to ETA during the turtle window. The possession limit for these vessels will decline to 12,000 lb., but they will be allowed to take 3 trips instead of 2. In other words, in total extra 147 trips would have to be taken at 12,000 lb. If the steam time for each trip is one day both ways, this will increase total fleet trip costs by \$470,400 if the steam time is 2 days assuming that trip costs average \$1600 per DAS. This is in addition to the increase in fleet trip costs by \$56,376 due to fishing more in the less productive season, totaling an increase in fishing costs by \$526,776.

The results are based on the assumption that the reduction in the possession limit will have no affect on the number of trips taken to ETA during the turtle season. If the lower possession limit provides an incentive for some vessels to avoid taking any trips to ETA during this season, the

increase in costs will be less, impacts on F will be higher, and potentially beneficial impacts on turtles if more effort shifted out of this season than expected.

In addition, this measure will involve closure of DMV (Alternative 3) from Sept.1 through October 31st. The impacts of this closure are expected to be positive because meat weight is expected to be 5% higher in the window Nov.1 to Aug.31st compared to the Sept.1 to Oct.31st window. If there is no change in the possession limit for DMV trips, this means the vessels will land their trips in shorter time reducing their trip costs. It is estimated that 6.7%, or 64 DMV trips would normally take place during the turtle window, in this case September-October. The DAS-used for these trips is estimated to be 611 DAS, and this effort will be removed from this particular turtle window. This constitutes a 10% effort shift and a decline in F by 0.005.

Therefore, the net change in F of closing DMV (decline in F by 0.005) and moving effort from June 15 to Aug.31st window to the rest of the year (increase in F by 0.005) will be $F=0.0$, that is, there will be no change F. Since the same 64 DMV trips will be taken in the more productive season with higher LPUE, the DAS-used will decline slightly by 29 days reducing the overall fleet trip costs slightly by \$46,765. If this is deducted from the increase in costs due to the ETA measure discussed above, the total increase in costs of the combined measure will decline to \$480,011 assuming that same number of vessels continue to take 147 trips in the ETA area during the turtle season. The increase in costs will be less if the number of ETA trips decline during the turtle season.

The results discussed above assume that there will be no adjustment to the possession limits to keep fishing mortality constant when effort is moved to a less productive season. If the possession limit is adjusted down, however, to 11,750 lb. for ETA (from 12000 lb.) for those taking 2 trips outside of the turtle window then shifting effort from June 15 to August 31st will have no impact on F. But this reduction will lower landings by 74,028 lb. and revenues by \$541,141. For the Delmarva closure, since effort is moved to a more productive season, keeping effort (DAS-used) at the same level would mean an increase in possession limit for this area (to 18,170 lb.). As a result revenues would increase by \$422,956. The net result of adjusting possession limits for both ETA and DMV would be a decrease in fleet revenue by \$118,185.

1.4.1.2 Option B (ETA and Delmarva reduced poss limit)

Assumptions: Moving effort from June15 to Aug.31 is estimated to reduce meat weight by 7.9%. We calculated that 21.9% of the Mid-Atlantic access area effort took place during this time period and the rest, 78.4% took place outside of the Turtle window. Applying the same % distribution of effort to 1020 trips (3 access area trips per 340 FT equivalent vessel) that will be allocated for the 2010 fishing year, we estimated that about 220 trips will take place during this window, totaling 3.96 million lb. Furthermore, we assumed that 21.6% of the Delmarva trips take place during this time period, totaling 73 (340*0.216) trips and totaling 1.32 million lb. at a possession limit of 18,000. There will be about 147 trips to ETA totaling 2.64 million lb.

Assuming a reduction in possession limit for DMV to 9,000 lb. and 73 trips such trips taken to this area during the window June 15 to Aug.31st, landings from DMV will decline to 0.66 lb. The possession limit for ETA trips will be reduced to 12,000 lb. however. Assuming that the same number of ETA trips, i.e., 147 trips will be taken at 12,000 lb. each, total landings from this

area will decline to 1.76 million lb. and total landings from Mid-Atlantic access areas including DMV will decline to 2.42 million lb. during this window. This is equivalent to a 39% reduction in landings and effort as measured by DAS-used during the turtle window. Total DAS-used is estimated by dividing total landings with the LPUE. Status quo DAS-used is estimated to be 1866 DAS, which is expected to decline to 1133 DAS, or by 721 DAS during the window.

Moving this effort and landings from the turtle window to the rest of the year corresponds to a 9.4% effort shift. If the possession limits are not adjusted down for the lower meat-weight outside the window and there is no reduction in total landings from the DMV and ETA areas for the year, the fishing mortality is estimated to increase by 0.008. There would be no loss in scallop revenue because the vessels will be allowed to land the same amount of pounds.

Because the number of trips would increase for people that take their trips in the summer period, however, there will be an increase in fishing costs. As indicated above, 147 trips are expected to be taken to ETA and 73 trips during the turtle window. The possession limit for these vessels will decline to 12,000 lb. for ETA, but they will be allowed to take 3 trips instead of 2. The possession limit for DMV will decline to 9,000 lb., but they will be allowed to take 2 trips instead of 1. In other words, in total extra (147+73=220) trips would have to be taken at reduced possession limit in both areas. If the steam time for each trip is one day each day, this will increase total fleet trip costs by \$704,896 assuming that trip costs average \$1600 per DAS. In addition, the fleet trip costs will increase by \$98,659 because effort is shifted to the less productive season. Thus, total trip costs for the fleet will go up by 803,555. This is assuming that the reduction in the possession limit will have no affect on the number of trips taken to ETA and DMV during the turtle season. If the lower possession limit provides an incentive for some vessels to avoid taking any trips to ETA during this season, the increase in costs will be less.

In addition, this measure will involve closure of DMV (Alternative 3) from Sept.1 through October 31st. The impacts of this closure are expected to be positive because meat weight is expected to be 5% higher in the window Nov.1 to Aug.31st compared to the Sept.1 to Oct.31st window. If there is no change in the possession limit for DMV trips, this means the vessels will land their trips in shorter time reducing their trip costs. It is estimated that 6.7%, or 64 DMV trips would normally take place during the turtle window. The DAS-used for these trips is estimated to be 611 DAS, and this effort will be removed from this particular turtle window. This constitutes a 10% effort shift and a decline in F by 0.005.

Therefore, the net change in F of closing DMV (decline in F by 0.005) and moving effort from June 15 to Aug.31st window to the rest of the year (increase in F by 0.008) will be net increase in F by 0.003. Since the same 64 DMV trips will be taken in the more productive season with higher LPUE, the DAS-used will decline slightly by 29 days reducing the overall fleet trip costs by \$46,972. If this is deducted from the increase in costs due to shifting effort from the June 15th–Aug.31st window, the total increase in costs of the combined measure will be \$756,789. This is assuming that same number of vessels continue to take trips in those areas during the turtle season and will be less if the number of trips decline during the turtle season.

The results discussed above assume that there will be no adjustment to the possession limits to keep fishing mortality constant when effort is moved to a less productive season. If the ETA

possession limit is adjusted down to 11,630 lb. (from 12000 lb. for those taking 2 trips) and DMV possession limit to 8,723 lb. outside of the turtle window, then shifting effort from June 15 to August 31st will have no impact on F. But this reduction will lower landings by 129,548 lb. and revenues by \$943,111. For the Delmarva closure, since effort is moved to a more productive season, keeping effort (DAS-used) at the same level would mean an increase in possession limit for this area (to 18,170 lb.). As a result revenues would increase by \$422,956. The net result of adjusting possession limits for both ETA and DMV would be a decrease in fleet revenue by \$524,041.

1.4.2 Combination of Delmarva seasonal closure in September and October as well as a limiting the number of trips that can be taken in ETA with a reduced possession limit between June 15 through August 31

Same as in the above moving effort from June 15 to Aug. 31 is estimated to reduce meat weight by 7.9% and that 21.9% of the Mid-Atlantic access area effort will take place during this time period and the rest, 78.4% took place outside of the Turtle window. Applying the same % distribution of effort to 1020 trips (3 access area trips per 340 FT equivalent vessel) that will be allocated for the 2010 fishing year, we estimated that about 220 trips will take place during this window, totaling 3.96 million lb. Furthermore, we assumed that 21.6% of the Delmarva trips take place during this time period, totaling 73 (340*0.216) trips and totaling 1.32 million lb. at a possession limit of 18,000. There will be about 147 trips to ETA totaling 2.64 million lb.

For this alternative there will be no reduction in possession limit for DMV trips; therefore, the model still projects that 73 trips will be taken in this area during the window June 15 to Aug. 31 will take place. The possession limit for ETA trips will be reduced to 14,000 lb. however. Assuming that the number of ETA trips will equal to 147 trips when number of trips are limited to one, and these will be taken at 14,000 lb. each, total landings from this area will decline to 2.05 million lb. and total landings from Mid. Atl. access areas including DMV will decline to 3.37 million lb. during this window. This is equivalent to a 15% reduction in landings and effort as measured by DAS-used during the turtle window. Total DAS-used estimated by dividing total landings by the LPUE. Status quo DAS-used is estimated to be 1854 DAS, which is expected to decline to 1579 DAS, or by 275 DAS during the window.

Moving this effort and landings from the turtle window to the rest of the year is about a 3.6% effort shift. If the possession limit is increased to 22,000 lb. for the second trip for those vessels that took ETA trips during the turtle window (at 14,000 lb.), and there is no reduction in total landings from the DMV and ETA areas for the year, the fishing mortality is estimated to increase by 0.003. There would be no loss in scallop revenue because the vessels will be allowed to land the same amount of pounds. Because more trips will take place in the window when meat weights are lower compared to the status quo, it will take more DAS to land the same pounds. Therefore the fleet fishing costs will increase by \$37,974, a much lower increase compared to the alternatives above. This alternative has lower costs because vessels do not have to take additional trips, only 2 trips in ETA permitted, excluding necessary broken trip provisions.

In addition, this measure will involve closure of DMV (Alternative 3) from Sept. 1 through October 31st. The impacts of this closure are expected to be positive because meat weight is expected to be 5% higher in the window Nov. 1 to Aug. 31st compared to the Sept. 1 to Oct. 31st

window. If there is no change in the possession limit for DMV trips, this means the vessels will land their trips in shorter time reducing their trip costs. It is estimated that 6.7%, or 64 DMV trips would normally take place during the turtle window. The DAS-used for these trips is estimated to be 611 DAS, and this effort will be removed from this particular turtle window. This constitutes a 10% effort shift and a decline in F by 0.005.

Therefore, the net change in F of closing DMV (decline in F by 0.005) and moving effort from June 15 to Aug.31st window to the rest of the year (increase in F by 0.008) will be net decrease in F by 0.002. Since the same 64 DMV trips will be taken in the more productive season with higher LPUE, the DAS-used will decline slightly by 29 days reducing the overall fleet trip costs by \$46,972. If this is deducted from the increase in costs due to effort shifts from ETA during the turtle window, the total trips costs with the combined measure will decline slightly by \$8,791 for the fleet.

The results discussed above assume that there will be no adjustment to the possession limits to keep fishing mortality constant when effort is moved to a less productive season. If the possession limit is adjusted down to 21500 lb. (from 22000 lb.) for those taking trips outside of the turtle window then shifting effort from June 15 to August 31st will have no impact on F. But this reduction will lower landings 49,352 lb and revenues by \$360,761. For the Delmarva closure, since effort is moved to a more productive season, keeping effort (DAS-used) at the same level would mean an increase in possession limit for this area (to 18,170 lb.). As a result revenues would increase by \$422,956. The net result of adjusting possession limits for both ETA and DMV would be an increase in fleet revenue by \$62,195.

1.4.3 Combination of Delmarva seasonal closure in September and October as well as a restriction on the number of access area trips in the Mid-Atlantic that can be used during June 15 through August 31

1.4.3.1 Option A (one trip maximum)

Status quo is same as above: moving effort from June 15 to Aug. 31 is estimated to reduce meat weight by 7.9% and that 21.9% of the Mid-Atlantic access area effort will take place during this time period and the rest, 78.4% took place outside of the Turtle window. Applying the same % distribution of effort to 1020 trips (3 access area trips per 340 FT equivalent vessel) that will be allocated for the 2010 fishing year, we estimated that about 220 trips will take place during this window, totaling 3.96 million lb. Furthermore, we assumed that 21.6% of the Delmarva trips take place during this time period, totaling 73 (340*0.216) trips and totaling 1.32 million lb. at a possession limit of 18,000. There will be about 147 trips to ETA totaling 2.64 million lb.

The possession limit for access area trips will stay at 18,000 lb. When number of trips is restricted to one, it is estimated that 151 vessels will take one trip in either of the ETA or DMV areas. This is based on the number of vessels that took at least one trip in ETA in 2007 and 2008 during the turtle window (44.8%). As a result, total landings from the access areas will decline to 2.7 million lb. during this window. This is equivalent to a 31% reduction in landings and effort as measured by DAS-used during the turtle window in AA. Total DAS-used estimated by dividing total landings by the LPUE. Status quo DAS-used is estimated to be 1854 DAS, which is expected to decline to 1270 DAS, or by 583 DAS during the window.

Moving this effort and landings from the turtle window to the rest of the year constitutes about a 7.6 % effort shift. If the possession limit is not adjusted down outside of the window for the decline in meat-weight, thus there is no reduction in total landings from the DMV and ETA areas for the year, the fishing mortality is estimated to increase by 0.006. There would be no loss in scallop revenue because the vessels will be allowed to land the same amount of pounds. Because more trips will take place in the window when meat weights are lower compared to the status quo, it will take more DAS to land the same pounds. Therefore the fleet fishing costs will increase by \$79,820. This alternative has lower costs than Alternative 1.1 because vessels do not have to take additional trips, and there is no change in possession limit with this alternative.

In addition, this measure will involve closure of DMV (Alternative 3) from Sept.1 through October 31st. The impacts of this closure are expected to be positive because meat weight is expected to be 5% higher in the window Nov.1 to Aug.31st compared to the Sept.1 to Oct.31st window. If there is no change in the possession limit for DMV trips, this means the vessels will land their trips in shorter time reducing their trip costs. It is estimated that 6.7%, or 64 DMV trips would normally take place during the turtle window. The DAS-used for these trips is estimated to be 611 DAS, and this effort will be removed from this particular turtle window. This constitutes a 10% effort shift and a decline in F by 0.005.

Therefore, the net change in F of closing DMV (decline in F by 0.005) and limiting the number of trips to one trip during the June 15 – Aug.31 window (increase in F by 0.006) will be net increase in F by 0.001. Since the same 64 DMV trips will be taken in the more productive season with higher LPUE, the DAS-used will decline slightly by 29 days reducing the overall fleet trip costs by \$46,972. If this is deducted from the increase in costs due to effort shifts from ETA during the turtle window, the total trips costs with the combined measure will increase by \$33,055 for the fleet.

The results discussed above assume that there will be no adjustment to the possession limits to keep fishing mortality constant when effort is moved to a less productive season. If the possession limit is adjusted down to 17,880 lb. (from 18000 lb.) for those taking trips outside of the turtle window, then shifting effort from June 15 to August 31st will have no impact on F. But this reduction will lower landings by 104,812 lb. and revenues by \$766,175. For the Delmarva closure, since effort is moved to a more productive season, keeping effort (DAS-used) at the same level would mean an increase in possession limit for this area (to 18,170 lb.). As a result revenues would increase by \$422,956. The net result of adjusting possession limits for both ETA and DMV would be an increase in fleet revenue by \$343,218.

1.4.3.2 Option B (two trip maximum)

The number of vessels that took one or two trips is estimated about 240 vessels according to the 2007-2008 ETA data when DMV was not open. The landings data from MA AA for the earlier years indicated that 21.6% trip took place during the window from June 15 to Aug.31st, which amounts to 220 trips from both areas assuming an allocation of 3 trips per vessel. Therefore, limiting the number of trips to two trips per vessels is not expected to have any impact on the total number of trips taken from both areas during the turtle window. If the same assumptions are used and the projected limit of trips would be 240 under these conditions, that is greater than the

projected number of 220 trips for 2010. Therefore, this measure may not comply with the RPM since it would not likely be a limit if previous fishing trends remained the same.

1.4.4 Summary

Combined measure 1.2 is the most favorable. The net impacts have minimal impacts on F, slightly positive. Impacts on revenue are zero since all catch can be recaptured outside the window. Fishing costs are minimal since vessels do not have to take additional trips. Total effort shift is about 6.4% when the two measures are combined, which is lower than 10% originally discussed, but behavioral responses are uncertain. These combined measures project about 886 DAS will be shifted from MA AA from the turtle window, the equivalent of a 36% reduction of MA AA projected effort during that time for 2010. The next best alternative seems to be Combined Measure 1.3 Option A.

Table 1 – Summary of potential impacts on fishing mortality, effort shifts, yield, revenue, and fishing costs associated with combined RPM alternatives

	Combined Measure 1.1 Seasonal closure in DMV + Reduced Possession limit and additional trip		Combined Measure 1.2 Seasonal closure in DMV + Reduced poss limit in ETA of 14,000 in window and 22,000 on subsequent trip	Combined Measure 1.3 Seasonal closure in DMV + Max # of MA AA trip from June15-Aug31	
	Option A - ETA only	Option B - ETA and DMV		Option A - max of 1 trip	Option B - max of 2 trips
	NCLF20	NCLF20	NCLF20	NCLF20	NCLF20
Scenario	NCLF20	NCLF20	NCLF20	NCLF20	NCLF20
Possession limit ETA during window	12,000	12,000	14,000	18,000	18,000
Possession limit DMV during window	18,000	9,000	18,000	18,000	18,000
Projected # of trips in window PRE RPM	220	220	220	220	220
Projected # of trips in window POST RPM	220	220	220	151	240
Difference in # of trips in MA AA during window	0	0	0	-69	20
Total landings in MA AA in window PRE RPM	3,965,760	3,965,760	3,965,760	3965760	3965760
Total landings in MA AA in window POST RPM	3,084,480	2,423,520	3,378,240	2718000	4320000
Difference in landings in MA AA during window	(881,280)	(1,542,240)	(587,520)	(1,247,760)	354,240
Projected DAS used in MA AA during win. PRE RPM	1854	1854	1854	1854	1854
Projected DAS used in MA AA during win. POST RPM	1442	1133	1579	1270	2019
Difference in projected DAS used in MA AA during win.	-412	-721	-275	-583	166
% reduction in MA AA effort during window	-22%	-39%	-15%	-31%	9%
Total effort shift in MA (AA +OA) during window	5.4%	9.4%	3.6%	7.6%	-2.2%
Change in F	0.005	0.008	0.003	0.006	-0.002
Change in fishing costs (increase)	535,797	803,555	37,974	79,820	(22,661)
Change in Revenue - no change in poss limit	0	0	0	0	0
Possession limit change	11750	ETA=11630 DMV=8723	21500	17880	increase
Change in Revenue with change in poss limit (negative)	(541,141)	(946,997)	(360,761)	(766,175)	Positive

Limit on MA AA effort by # of trips or poss limit

Seasonal closure in DMV for Sept and Oct

	Combined Measure 1.1 Seasonal closure in DMV + Reduced Possession limit and additional trip		Combined Measure 1.2 Seasonal closure in DMV + Reduced poss limit in ETA of 14,000 in window and 22,000 on subsequent trip	Combined Measure 1.3 Seasonal closure in DMV + Max # of MA AA trip from June15-Aug31	
	Option A - ETA only	Option B - ETA and DMV		Option A - max of 1 trip	Option B - max of 2 trips
Scenario	NCLF20	NCLF20	NCLF20	NCLF20	NCLF20
Projected # of trips in window PRE RPM	64	64	64	64	64
Projected # of trips in window POST RPM	0	0	0	0	0
Difference in # of trips in MA AA during window	-64	-64	-64	-64	-64
Total landings in MA AA in window PRE RPM	1151172	1151172	1151172	1151172	1151172
Total landings in MA AA in window POST RPM	0	0	0	0	0
Difference in landings in MA AA during window	-1151172	-1151172	-1151172	-1151172	-1151172
Projected DAS used in MA AA during win. PRE RPM	611	611	611	611	611
Projected DAS used in MA AA during win. POST RPM	0	0	0	0	0
Difference in projected DAS used in MA AA during win.	-611	-611	-611	-611	-611
% reduction in MA AA effort during window	100%	100%	100%	100%	100%
Total effort shift in MA (AA +OA) during window	10.1%	10.1%	10.1%	10.1%	10.1%
Change in F	-0.005	-0.005	-0.005	-0.005	-0.005
Change in fishing costs (decrease)	-46,765	-46,765	-46,765	-46,765	-46,765
Change in Revenue - no change in poss limit	0	0	0	0	0
Change in poss limit	18170	18170	18170	18170	18170
Change in Revenue with change in poss limit (positive)	422,956	422,956	422,956	422,956	422,956

NET of combined alternatives

	Combined Measure 1.1 Seasonal closure in DMV + Reduced Possession limit and additional trip		Combined Measure 1.2 Seasonal closure in DMV + Reduced poss limit in ETA of 14,000 in window and 22,000 on subsequent trip	Combined Measure 1.3 Seasonal closure in DMV + Max # of MA AA trip from June15-Aug31	
	Option A - ETA only	Option B - ETA and DMV		Option A - max of 1 trip	Option B - max of 2 trips
Scenario	NCLF20	NCLF20	NCLF20	NCLF20	NCLF20
Projected # of trips in window PRE RPM	284	284	284	284	284
Projected # of trips in window POST RPM	220	220	220	151	240
Difference in # of trips in MA AA during window	-64	-64	-64	-133	-44
Total landings in MA AA in window PRE RPM	5116932	5116932	5116932	5116932	5116932
Total landings in MA AA in window POST RPM	3084480	2423520	3378240	2718000	4320000
Difference in landings in MA AA during window	-2032452	-2693412	-1738692	-2398932	-796932
Projected DAS used in MA AA during win. PRE RPM	2464	2464	2464	2464	2464
Projected DAS used in MA AA during win. POST RPM	1442	1133	1579	1270	2019
Difference in projected DAS used in MA AA during win.	-1023	-1332	-885	-1194	-445
% reduction in MA AA effort during window	-41%	-54%	-36%	-48%	-18%
Total effort shift in MA (AA +OA) during window	7.4%	9.7%	6.4%	8.7%	3.2%
Change in F	0.000	0.003	-0.002	0.002	-0.007
Change in fishing costs	489,031	658,131	(8,791)	33,055	(69,426)
Change in Revenue - no change in poss limit	0	0	0	0	0
Change in Revenue with change in poss limit	(118,185)	(524,041)	62,195	(343,218)	