



**Mid-Atlantic Fishery Management Council**  
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## MEMORANDUM

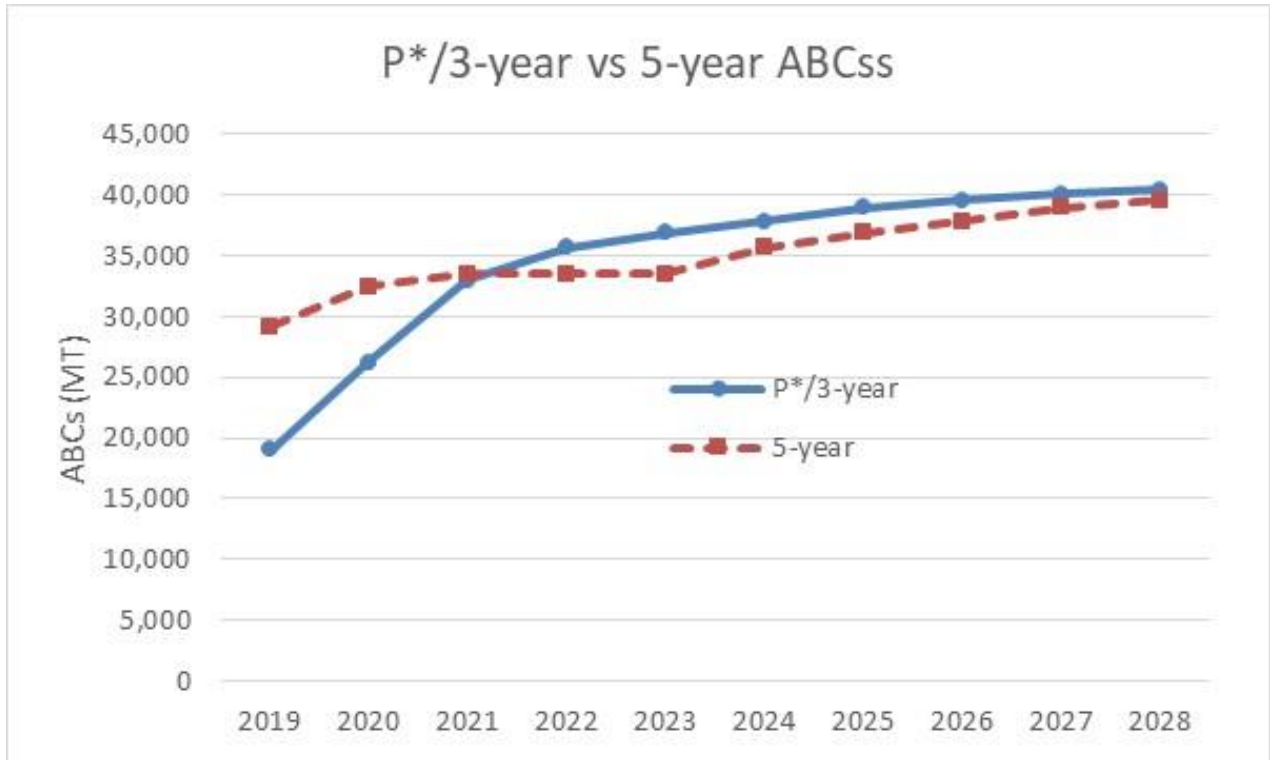
**Date:** August 13, 2018  
**To:** Council  
**From:** Jason Didden  
**Subject:** Additional mackerel projections using benchmark methodology

The mackerel framework notes that a catch of 33,474 MT (i.e. the P\*/risk policy acceptable biological catch (ABC) right at 100% of target biomass) results in a long term biomass of approximately 150% of the target. With the P\* approach however, ABC rises to 40,500 MT as biomass reaches and theoretically stabilizes at 122% of the target. Given the variable recruitment seen in the assessment biomass fluctuations are likely.

Projections were run for 10-years using the various rebuilding scenarios to evaluate the potential benefit of rebuilding faster and getting to the maximum projected ABC of 40,500 MT sooner with a shorter rebuilding timeline. Using the FMAT and Committee-recommended 33,474 MT maximum makes the catches in the 5-year and 7-year options nearly identical so both should rebuild in 5-years. As such the key comparison involves the P\*/3-year path versus a 5-year path – the ABCs with these paths are illustrated in Figure 1 on the next page. Once rebuilt, the standard P\* rules apply in both cases so the P\* projections post rebuilding (i.e. after 2022) are used for the 5-year path once it rebuilds (i.e. after 2024). The exact biomass at rebuilding will determine the exact ABCs after rebuilding, but this approach should be a close approximation.

The tables on page 3 provide the 10-year quotas and revenues (3% discount rate) associated with the ABCs from each of the alternatives. Focusing on the P\*/3-year and the 5-year options, the 5-year option has higher revenues in 2019-2020, revenues are similar in 2021, and the P\*/3-year has slightly higher revenues from year 4 and beyond until annual catches and revenues converge 7-8 years after rebuilding. Overall 10-year discounted revenues are highest with the longer rebuilding timelines.

Figure 1. The ABC trajectories of the P\*/3-year and 5-year rebuilding paths. The 5-year path is capped at 33,474 MT in 2021-2023 and then P\* takes over in year 2024 once rebuilt.



Notes: While a specific projection capping the 5-year rebuilding plan at 33,474 MT in 2021-2023 was not made, the slightly lower catches probably would not lead to rebuilding in 4 years. The biomass in year 5 would likely just be slightly higher than 100%. Once rebuilt, the catch trajectory from the post-rebuilt P\* calculations are used to approximate the catches that would occur after rebuilding under the 5-year option (i.e. 2024 and beyond).

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Table 1. Expected DAHs under Alternatives 1a-1d

Canada2 - 10,000 MT deduction for Canada.										
DAH	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
1a	9,177	9,177	9,177	9,177	9,177	9,177	9,177	9,177	9,177	9,177
1b	7,553	14,471	21,060	23,660	24,814	25,717	26,788	27,432	27,915	28,239
1c	17,371	20,557	21,517	21,517	21,517	23,660	24,814	25,717	26,788	27,432
1d	18,999	21,517	21,517	21,517	21,517	23,660	24,814	25,717	26,788	27,432
Canada1 - 50% deduction for Canada.										
DAH	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
1a	9,177	9,177	9,177	9,177	9,177	9,177	9,177	9,177	9,177	9,177
1b	8,025	11,483	14,778	16,078	16,655	17,106	17,642	17,964	18,205	18,368
1c	12,933	14,526	15,006	15,006	15,006	16,078	16,655	17,106	17,642	17,964
1d	13,747	15,006	15,006	15,006	15,006	16,078	16,655	17,106	17,642	17,964

Note: 1a keeps all current measures

Table 2. Expected discounted (3%) revenues under Alternatives 1a-1d

Canada2 - 10,000 MT deduction for Canada. Annual Discounted Revenues (3% discount rate)											
Rev	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total Discounted Revenues
1a	5,506,200	5,345,825	5,190,122	5,038,953	4,892,187	4,749,696	4,611,356	4,477,044	4,346,645	4,220,044	48,378,073
1b	4,532,081	8,429,731	11,910,658	12,991,402	13,227,921	13,310,310	13,460,690	13,382,629	13,221,712	12,985,933	117,453,068
1c	10,422,743	11,974,677	12,169,181	11,814,739	11,470,621	12,245,643	12,468,584	12,546,244	12,687,991	12,614,411	120,414,834
1d	11,399,204	12,534,257	12,169,181	11,814,739	11,470,621	12,245,643	12,468,584	12,546,244	12,687,991	12,614,411	121,950,876
Canada1 - 50% deduction for Canada. Annual Discounted Revenues (3% discount rate)											
Rev	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total Discounted Revenues
1a	5,506,200	5,345,825	5,190,122	5,038,953	4,892,187	4,749,696	4,611,356	4,477,044	4,346,645	4,220,044	48,378,073
1b	4,814,756	6,689,347	8,357,738	8,828,137	8,878,461	8,853,700	8,864,854	8,763,654	8,622,836	8,446,345	81,119,828
1c	7,760,087	8,461,820	8,487,000	8,239,806	7,999,811	8,321,366	8,368,801	8,345,461	8,355,975	8,260,584	82,600,711
1d	8,248,318	8,741,610	8,487,000	8,239,806	7,999,811	8,321,366	8,368,801	8,345,461	8,355,975	8,260,584	83,368,732

Note: 1a keeps all current measures