

DECISION DOCUMENT

Blue Crab Fishery Management Plan

Amendment 3 Adaptive Management



This document was developed to help the MFC track previous activity and prepare for upcoming actions for Blue Crab FMP Amendment 3 Adaptive Management.

May 2025

Summary

Amendment 3 to the N.C. Blue Crab Fishery Management Plan (FMP) was adopted in February 2020 and is nearly halfway through the legislatively mandated 10-year stock rebuilding period with little evidence suggesting management measures have been successful in ending overfishing or achieving sustainable harvest. The intent of the Amendment 3 adaptive management framework is to allow for management changes if measures are or are not meeting objectives. Because Amendment 3 management measures have been unsuccessful in ending overfishing or achieving sustainable harvest, the adaptive management framework will be used to implement management measures projected to reduce fishing mortality (F) closer to the F target and rebuild the spawning stock closer to the spawner abundance target with greater than 50% probability of success.

Amendment 3 Background

As part of [Amendment 3 to the North Carolina Blue Crab FMP](#) a benchmark [stock assessment](#) was undertaken using data from 1995–2016. Based on assessment results, the N.C. blue crab stock was overfished and overfishing was occurring in 2016.

The North Carolina Fishery Reform Act of 1997 requires the State specify a time period not to exceed two years to end overfishing and achieve a sustainable harvest within 10 years of the date of adoption of the plan. To meet this requirement, a minimum harvest reduction of 0.4% (in numbers of crabs) was projected to end overfishing and a harvest reduction of 2.2% was projected to achieve sustainable harvest and rebuild the blue crab spawning stock within 10 years with a 50% probability of success (Table 1).

Table 1. Catch reduction projections for varying levels of fishing mortality (F) and the probability of achieving sustainable harvest within the 10-year rebuilding period defined in statute. Bolded row is minimum required harvest reduction.

F (yr-1)	Catch Reduction (%)	Probability of achieving sustainable harvest within 10 years (%)	Comments
1.48	0.0	31	2016 average F from stock assessment
1.46	0.4	45	Catch reduction to meet F threshold and end overfishing
1.40	1.7	46	Catch reduction to meet spawner abundance threshold and end overfished status
1.38	2.2	50	Catch reduction to meet minimum statutory requirement for achieving sustainable harvest
1.30	3.8	67	
1.22	5.9	90	Catch reduction to meet F target
1.10	9.3	96	
1.00	12.3	100	
0.90	15.7	100	
0.80	19.8	100	Catch reduction to meet spawner abundance target
0.70	24.3	100	

At their February 2020 business meeting the MFC adopted Amendment 3 to the FMP with the following management strategies to end overfishing and achieve sustainable harvest in the blue crab fishery:

- North of the Highway 58 Bridge: A January 1 through January 31 closed season.
- South of the Highway 58 Bridge: A March 1 through March 15 closed season.
- A 5-inch minimum size limit for mature female crabs statewide.
- Replacing the current pot closure period and remaining closed in entirety (could not be reopened early).
- Maintain the prohibition on harvest of immature female hard crabs statewide.
- Maintain the 5% cull tolerance established in the 2016 Revision to Amendment 2.
- Adopt proposed adaptive management framework and allow measures to be relaxed if the assessment update indicated the stock was not overfished and overfishing was not occurring and recommend updating the stock assessment once 2019 data is available.

The adopted management provided an estimated 2.4% harvest reduction with a 50% probability of achieving sustainable harvest. This reduction was just above the statutorily required minimum (2.2% reduction), but below the harvest reduction level needed to reduce F to the target (5.9% reduction) and the reduction needed to increase spawner abundance to the target (19.8% reduction; Table 1).

Amendment 3 management strategies have been fully in place since January 2021. Amendment 3 also maintained all measures implemented with the [May 2016 Revision to the Blue Crab FMP](#). A summary of all management measures in place through Amendment 3 can be found in [Amendment 3](#), the annual [FMP Update](#) or in the [Amendment 3 flyer](#).

Amendment 3 Adaptive Management

1. Update the stock assessment at least once in between full reviews of the FMP, timing at the discretion of the division
 - a. If the stock is overfished and/or overfishing is occurring or it is not projected to meet the sustainability requirements, then management measures shall be adjusted using the director's proclamation authority
 - b. If the stock is not overfished and overfishing is not occurring, then management measures may be relaxed provided it will not jeopardize the sustainability of the blue crab stock
2. Any quantifiable management measure, including those not explored in this paper, with the ability to achieve sustainable harvest (as defined in the stock assessment), either on its own or in combination, may be considered
3. Use of the director's proclamation authority for adaptive management is contingent on:
 - a. Consultation with the Northern, Southern, and Shellfish/Crustacean advisory committees
 - b. Approval by the Marine Fisheries Commission

Upon evaluation by the division, if a management measure adopted to achieve sustainable harvest (either through Amendment 3 or a subsequent Revision) is not working as intended, then it may be revisited and either: 1) revised or 2) removed and replaced as needed provided it conforms to steps 2 and 3 above.

Post Amendment 3 Stock Assessment Update

Following full implementation of Amendment 3 management measures in 2021, DMF monitoring programs continued to observe historically low [commercial landings](#), coupled with continued [low abundance of all blue crab life stages](#) (e.g., male and female juveniles, male and female adults, mature females). In response to stock concerns expressed by commercial crabbers and continued poor trends in abundance since adoption of Amendment 3, the DMF began [updating the stock assessment](#) with data through 2022. [Results](#) of the model update indicate the magnitude and trends for estimated recruitment, female spawner abundance, and fishing mortality were similar to the benchmark assessment (Figure 1); however, the Maximum Sustainable Yield (MSY) based reference points used to determine stock status for both female spawner abundance and fishing mortality changed drastically (Figures 2-3).

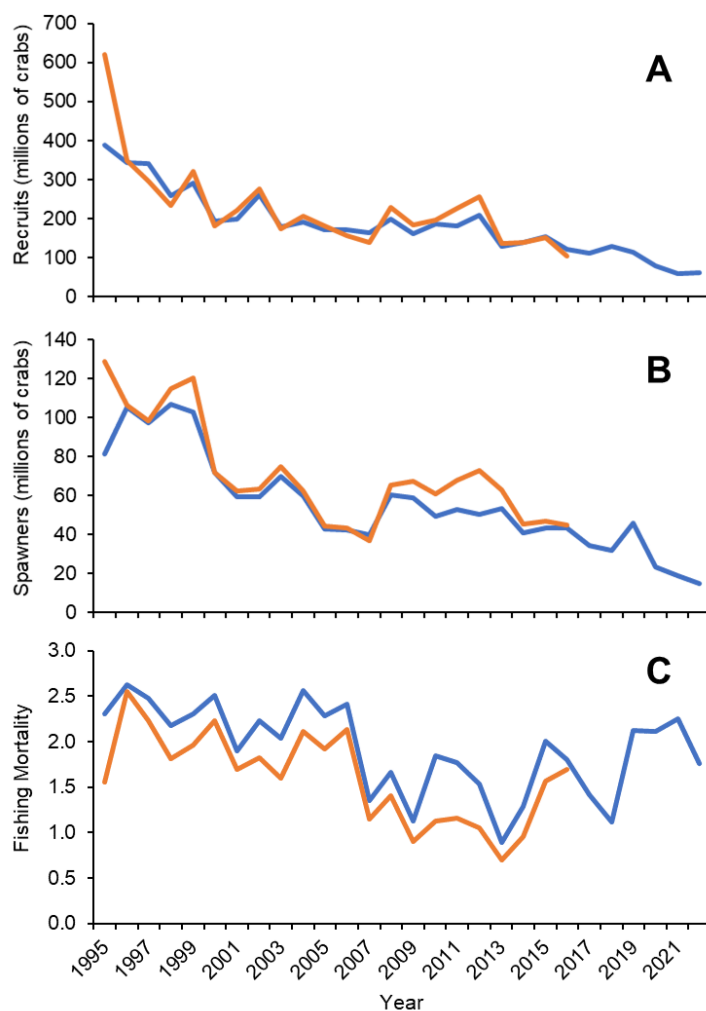


Figure 1. Comparison of estimates of (A) total recruitment, (B) female spawner abundance, and (C) fishing mortality between the 2023 stock assessment update (blue line) and the 2018 benchmark stock assessment (orange line).

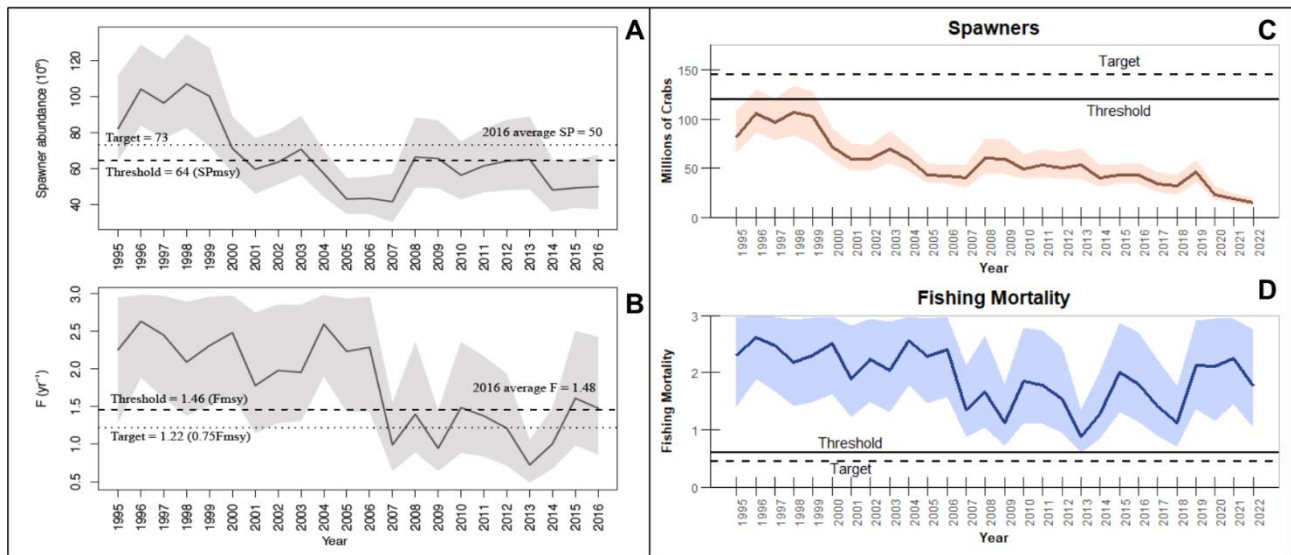


Figure 2. Annual estimates of (A) mature female spawner abundance and (B) fishing mortality relative to associated reference points from the 2018 benchmark stock assessment. Annual estimates of (C) mature female spawner abundance and (D) fishing mortality relative to associated reference points from the 2023 stock assessment update.

Due to the magnitude of the change in reference points, an external review of the assessment update was completed in late December 2023. Reviewers identified concerns with model specifications and results and strongly recommended resolving these issues before basing any management decisions solely on the assessment update. Suggestions provided by reviewers can only be incorporated with a new benchmark stock assessment. Given concerns with the assessment update identified by the DMF and external peer reviewers, **the DMF does not recommend using results of the 2023 stock assessment update to inform management.** Recommending against using the stock assessment update for management purposes does not invalidate the benchmark stock assessment or the data sources used in the model.

Declines in the North Carolina blue crab stock are not unique, as blue crab stocks in other Atlantic coast states have declined similarly. In January 2023 the South Carolina Department of Natural Resources released a [status report](#) for the South Carolina blue crab fishery. The report concluded the South Carolina blue crab stock has been in decline for nearly two decades and provided recommendations to prevent overharvesting, gradually reduce fishing pressure, prevent overexploitation, and strengthen enforcement capabilities. Concerns for the [Chesapeake Bay blue crab stock have also persisted](#). While the Chesapeake Bay blue crab stock is not depleted and overfishing is not occurring, juvenile abundance remains low. Precautionary management, focusing on protecting mature females and juveniles, has been recommended for the Chesapeake Bay stock and a benchmark stock assessment has been started to better understand the population.

Management Measures and Preliminary Recommendations

Size limits are used to rebuild or protect a portion of the spawning stock. Currently, male and mature female hard crabs are subject to a 5-inch minimum carapace width (CW) statewide (harvest of immature females is prohibited).

Because a minimum size limit is already in place for blue crabs, and because achieving necessary harvest reductions through size limit changes alone is unlikely, management options for increasing the minimum size limit or establishing a maximum size limit were not developed.

Prohibiting Crab Trawling prevents harvest from a gear that primarily harvests female crabs prior to the spawning season. Most crab trawl harvest occurs from December through April and is highly variable from year to year. Due to location and time of year crab trawls operate, most crabs harvested by crab trawls are females of lower market value that are caught just prior to spawning. Even at its peak, crab trawls accounted for a small percentage of overall blue crab landings. For example, in 2023 crab trawls accounted for 0.6% of all hard blue crab landings. There is often conflict between the crab trawl and crab pot fisheries and while the crab trawl fishery does not currently have a lot of participants, further growth of this fishery may be detrimental to the crab stock.

Seasonal Closures can be used to reduce overall harvest by restricting harvest during specific times of the year. Amendment 3 implemented a January 1–31 closure in areas north of the Highway 58 bridge to Emerald Isle and a March 1–15 closure in areas south of the Highway 58 bridge to Emerald Isle.

Life Stage Closures and Limits are used to limit harvest of specific life stages (e.g., immature females, sponge crabs, etc.). Amendment 3 maintained the prohibition on harvest of immature female hard blue crabs and harvest of dark sponge crabs from April 1–30. The intent of prohibiting harvest of immature female blue crabs is to allow immature females the opportunity to mature and spawn before being subject to harvest. Prioritizing the reproductive potential of female crabs through life-stage closures serves as a proactive investment to the sustainability of the blue crab population. This strategy not only fosters increased abundance within the crab population but likely contributes to higher recruitment.

Trip or Bushel Limits limit catch while continuing to allow harvest opportunities. Maryland and Virginia each manage blue crab harvest with some form of a trip limit in combination with other measures.

Preliminary Recommendations

Current management of the North Carolina blue crab fishery recognizes the conservation value of protecting mature female crabs by prohibiting harvest of dark sponge crabs from April 1–30 and by establishing crab spawning sanctuaries (CSS) at all coastal inlets. The purpose of the CSS is to protect mature females in these areas prior to and during the spawning season, though limited sanctuary size and other factors limit their effectiveness. Season closures and life stage harvest limits can be used to enhance the effectiveness of the existing CSS by providing broader protections.

The comprehensive blue crab management program in Chesapeake Bay prioritizes protection of mature female blue crabs. Virginia has implemented [extensive blue crab spawning sanctuaries](#) where the harvest of blue crab is seasonally prohibited, and Maryland has implemented [seasonal bushel limits for mature female crabs](#). Preferentially protecting mature female blue crabs in the Chesapeake Bay, allowed for [recovery of the blue crab stock](#) from low levels in the 2000's while allowing for [consistent commercial harvest](#). While the Chesapeake Bay blue crab stock has declined recently, it is [not depleted and overfishing is not occurring](#), though continued protection of mature females as well as immature blue crabs has been recommended.

Given these considerations, initial management options focus on limiting harvest of blue crabs during biologically important times of year (e.g., mating and spawning seasons), and specifically limiting harvest of mature females. Initial management options only included those projected to rebuild spawner abundance to a higher level with a much higher probability of success (Table 1).

Options 1, 2, and 3 implement 10-, 15-, or 20-bushel limits on all hard blue crabs year-round (**Option 1**), from September–December (**Option 2**), or from September–November (**Option 3**; Table 2a). **Option 3** implements seasonal bushel limits in combination with statewide season closures.

Option 4 implements a 10-, 15-, or 20-bushel limit on mature female blue crabs from September–October, a five-bushel limit on mature female mature female crabs from November–December, and no harvest of mature female blue crabs from January–May (Table 2b). **Option 5** is the same as **Option 4** but extends the period for no harvest of mature female crabs from January–May. **Option 6** implements a 10-, 15-, or 20-bushel limit on mature female blue crabs from September–November, a complete closure for all blue crabs from December–January and no harvest of mature female crabs from February–May. **Option 7** implements a 10-, 15-, or 20-bushel limit on mature female crabs from September–December and prohibits harvest of mature female crabs from January–May. **Option 8** is the same as **Option 7** but implements the 10-, 15-, or 20-bushel limit on mature female crabs from June–December.

In consideration of blue crab life history and blue crab fishery characteristics the **preliminary DMF recommendation presented to the Advisory Committees in March 2025 was Option 8.a, 10-bushel limit for mature female blue crabs from June–December and no harvest of mature female blue crabs from January–May** (Table 2b). The DMF also recommended maintaining existing season closures and all other blue crab management measures currently in place. In combination, these management measures should effectively reduce harvest by an estimated 21.7 percent compared to average landings from 2019–2023, increase the spawning stock biomass, and promote increased recruitment.

Table 2a. Season closure and trip limit management options. Unless stated otherwise all options are in addition to existing management including existing season closures. Estimated harvest reductions are calculated from 2016, 2023, and 2019–2023 commercial hard blue crab landings.

Option #	Measures	2016	2023	2019–2023
1	a. 10-bushel hard crab trip limit year-round	48.3	51.6	45.6
	b. 15-bushel hard crab trip limit year-round	34.5	38.3	31.9
	c. 20-bushel hard crab trip limit year-round	25.2	28.5	22.6
2	a. 10-bushel hard crab trip limit Sept–Dec	25.1	32.0	21.6
	b. 15-bushel hard crab trip limit Sept–Dec	20.4	25.2	16.4
	c. 20-bushel hard crab trip limit Sept–Dec	16.6	19.7	12.4
3	a. 10-bushel hard crab trip limit Sept–Nov, closed Dec–Mar	32.8	36.3	27.0
	b. 15-bushel hard crab trip limit Sept–Nov, closed Dec–Mar	28.5	30.2	22.3
	c. 20-bushel hard crab trip limit Sept–Nov, closed Dec–Mar	25	25.2	18.6
	d. 10-bushel hard crab trip limit Sept–Nov, closed Dec–Jan	27.4	34.5	24.0
	e. 15-bushel hard crab trip limit Sept–Nov, closed Dec–Jan	23.1	28.4	19.3
	f. 20-bushel hard crab trip limit Sept–Nov, closed Dec–Jan	19.6	23.4	15.6

Table 2b. Mature female season closure and trip limits management options. Unless stated otherwise all option are in addition to existing management including existing season closures. Estimated harvest reductions are calculated from 2016, 2023, and 2019–2023 commercial hard blue crab landings.

Option #	Measures	2016	2023	2019–2023
4	a. 10-bushel mature females Sept–Oct, 5-bushel mature females Nov–Dec, no mature females Jan–Mar	17.5	19.4	14.4
	b. 15-bushel mature females Sept–Oct, 5-bushel mature females Nov–Dec, no mature females Jan–Mar	15.7	16.9	12.3
	c. 20-bushel mature females Sept–Oct, 5-bushel mature females Nov–Dec, no mature females Jan–Mar	14.3	15.1	10.9
5	a. 10-bushel mature females Sept–Oct, 5-bushel mature females Nov–Dec, no mature females Jan–May	22.1	21.8	18.8
	b. 15-bushel mature females Sept–Oct, 5-bushel mature females Nov–Dec, no mature females Jan–May	20.2	19.2	16.7
	c. 20-bushel mature females Sept–Oct, 5-bushel mature females Nov–Dec, no mature females Jan–May	18.9	17.5	15.3
6	a. 10-bushel hard crabs limit Sept–Nov, complete closure Dec–Jan, no mature females Feb–May	34.8	37.8	29.9
	b. 15-bushel hard crabs limit Sept–Nov, complete closure Dec–Jan, no mature females Feb–May	30.3	31.6	24.2
	c. 20-bushel hard crabs limit Sept–Nov, complete closure Dec–Jan, no mature females Feb–May	26.7	26.4	19.8
7	a. 10-bushel mature females Sept–Dec, no mature females Jan–May	20.6	19.4	17.1
	b. 15-bushel mature females Sept–Dec, no mature females Jan–May	17.6	15.1	13.9
	c. 20-bushel mature females Sept–Dec, no mature females Jan–May	15.3	12.0	11.6
8	a. 10-bushel mature females June–Dec , no mature females Jan–May*	25.0	23.1	21.7
	b. 15-bushel mature females June–Dec, no mature females Jan–May	19.8	17.2	16.4
	c. 20-bushel mature females June–Dec, no mature females Jan–May	16.5	13.2	13.0

*Division preliminary recommendation presented to the MFC Advisory Committees (Northern, Southern, Shellfish/Crustacean) in March 2025

Advisory Committee Review

The Amendment 3 adaptive management framework requires “consultation” with the Northern, Southern, and Shellfish/Crustacean advisory committees before management changes can be approved by the MFC. To fulfill the “consultation” requirement, the advisory committees met the week of March 18–20 to discuss adaptive management and provide recommendations. DMF staff provided background information and the preliminary DMF recommendation. In addition, DMF staff were available prior to each meeting to answer questions and discuss blue crab science and management with the public.

Key takeaways from all meetings included:

- Concern about the economic impact of the preliminary DMF recommendation
- Concern about how the preliminary recommendation would disproportionately impact certain fishery segments and areas and the need for fair management between regions
- Distrust of stock assessment results and data
- Concern about the effects of water quality and predation on the blue crab stock
- Questions about authority to make management changes without an updated stock assessment
- Landings declines are the result of market conditions and participation declines, not a declining blue crab stock
- The need for cooperation with industry for data collection and formulating management
- Some acknowledgement the stock has declined since the 1990’s even if it is not because of fishing
- Some concern about long-term declining trends

Advisory Committee Recommendations

Northern

Motion for the Marine Fisheries Commission to not take final action on Blue Crab Amendment 3 Adaptive Management until August 2025, instead of May 2023 (motion passes 10-0)

Motion for the Marine Fisheries Commission to remain status quo regarding the Blue Crab FMP Amendment 3 Adaptive Management (motion passes 7-2, with 1 abstention)

Southern

Motion to recommend the Marine Fisheries Commission to remain status quo regarding Blue Crab FMP Amendment 3 Adaptive Management and to move the Marine Fisheries Commission action on Blue Crab to the August 2025 meeting (motion passes 6-1, with 1 abstention)

Shellfish/Crustacean

Motion for the Marine Fisheries Commission to not take final action on Blue Crab Amendment 3 Adaptive Management until August 2025, instead of May 2025 (motion passes, 5-0, with 2 abstentions)

Motion to recommend to the Marine Fisheries Commission to remain status quo regarding Blue Crab FMP Amendment 3 (motion passes 4-0, with 3 abstentions)

Amendment 3 Adaptive Management Next Steps and Timeline

Amendment 3 is nearly halfway through the required rebuilding timeline and while an updated stock assessment is not currently available to inform stock status, there is little evidence suggesting overfishing has ended or Amendment 3 sustainability objectives will be met. Because there are strong indicators the stock is not recovering, the **DMF remains concerned about the blue crab stock**. However, in consideration of advisory committee input the DMF intends to:

Bring adaptive management options to the MFC for final action in August 2025

Final MFC adaptive management action will occur in August 2025. Prior to the August meeting, the DMF will consider advisory committee input, re-evaluate the preliminary recommendations and continue to explore additional management options. At the August 2025 meeting, the division will present additional options accounting for public and advisory committee input.

Prioritize completing assessing the stock

Potential avenues for assessing the stock have been explored but there is no anticipated completion date at this time. With the declining trends in all data sources, there is potential a new assessment will not show stock recovery and may indicate the stock requires significant harvest reductions for recovery.

The updated timeline for revision development is:

May 2024	DMF presents results of stock assessment update and adaptive management plan to MFC
May 2024 – August 2024	Outreach and analysis
September 2024	DMF updates Northern, Southern, and Shellfish/Crustacean advisory committees
September 2024 – December 2024	Additional outreach and analysis. DMF drafts Revision to Amendment 3
March 2025	MFC AC (Northern, Southern, Shellfish/Crustacean) review draft
May 2025	DMF updates MFC on advisory committee recommendations and next steps – NO ACTION
August 2025	MFC scheduled to vote on adoption of Amendment 3 Revision

*Gray indicates a step is complete.

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