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Via U.S. Priority Mail

Draft Shrimp FMP Amendment 2 Comments
P.O. Box 769
Morehead City, NC 28557

Re: Draft Amendment 2 to the North Carolina Shrimp Fishery Management Plan

Dear Commissioners and Staff:

The North Carolina Wildlife Federation ("the Federation") hereby submits the following comments in response to the North Carolina Division of Marine Fisheries' ("DMF") Draft Amendment 2 to the North Carolina Shrimp Fishery Management Plan ("Draft Amendment 2").[1]

The Federation has provided numerous comments and technical suggestions to DMF and the Marine Fisheries Commission ("MFC") since its original Petition for Rulemaking submitted to the MFC in November 2016. The Federation is disappointed that the primary suggestions contained in its second, revised petition, submitted to the MFC in May 2019, have been mostly excluded from consideration in Draft Amendment 2 despite the MFC's commitment to consider the proposed management strategies during the Amendment 2 process. Nevertheless, the Federation remains supportive of its revised petition and the following suite of management options proposed in the revised petition:

- Create a new designation for coastal waters called Shrimp Trawl Management Areas; [2]
- Designate all Internal Coastal Waters not otherwise designated as Primary Nursery Areas, Secondary Nursery Areas, Special Secondary Nursery Areas, or otherwise closed to shrimp trawling, as Shrimp Trawl Management Areas;
- Establish criteria for the opening of shrimp season in Shrimp Trawl Management Areas;
- Prohibit shrimp trawling in all Shrimp Trawl Management Areas on Tuesdays and Thursdays upon the opening of trawling season; and

[1] *See Draft Amendment 2 to the North Carolina Shrimp Fishery Management Plan*, N.C. DIV. MARINE FISHERIES (2021), https://files.nc.gov/ncdeq/Marine-Fisheries/hot-topics/shrimp-amendment2/ShrimpFMPAm2_MFC_FINAL_20210430.pdf [hereinafter *Draft Amendment 2*].
[2] These areas could alternatively be designated as Special Secondary Nursery Areas, as provided in the Federation's first petition for rulemaking, with the Federation's same suggested restrictions on effort and gear applied.

- Restrict the headrope length for shrimp trawls in Shrimp Trawl Management Areas and the other areas designated in 15A N.C. Admin. Code 3L .0103(d) to 110 feet total.

These measures, offered numerous times by the Federation to DMF and the MFC, are the most effective options to retain a productive shrimp trawl fishery while rebuilding and conserving depleted finfish populations. The measures proposed by the Federation would achieve these goals by managing: (1) the areas open to shrimping; (2) the times when shrimp may be taken; and (3) the gear used to take shrimp. Taken together, these measures would synergistically ensure that shrimp trawling is conducted in a more sustainable manner that minimizes the bycatch of juvenile finfish species from estuarine waters.

Draft Amendment 2 fails to provide options that achieve similar protections for the resource and industry. Additionally, the document itself is technically deficient, and much of the document's discussion of different management options appears to ignore best management practices, the best available science, and the precautionary principle. Despite this, in the absence of a complete closure of the Pamlico Sound to shrimp trawling, or the adoption of Shrimp Trawl Management Areas as detailed in the Federation's second petition for rulemaking, the Federation supports, as a less preferred alternative, a combination of management options listed in Draft Amendment 2 that may partially achieve a similar synergistic effect necessary to reduce bycatch. Specifically, the Federation would recommend the buffer options contained in Appendix 2.3, Figures 2.3.16 and 2.3.17, coupled with a 110-foot maximum headrope; shrimping only on Mondays, Wednesday, and Friday from sunrise to sunset; 45-minute tow times; and a formal recommendation to the General Assembly to allow limited entry as a means to manage participation in the shrimp trawl fishery;[3] and converting all Special Secondary Nursery Areas to permanent Secondary Nursery Areas.

BACKGROUND ON SHRIMP TRAWLING AND BYCATCH IN NORTH CAROLINA

North Carolina has the largest and most productive estuarine system of any state on the east coast.[4] Estuarine-dependent species account for more than 90 percent of the State's commercial fisheries landings and over 60 percent of the recreational harvest.[5] The success and viability of these fisheries requires protection of important habitat areas on which these species rely for survival. North Carolina's existing nursery program provides important protections to larval and early juvenile populations that inhabit shallow, protected habitat areas. Later stage juveniles—those juveniles that have not yet reached adulthood and therefore have not spawned—however, lose habitat protection once they move into the sounds and ocean waters and are exposed to shrimp trawls and other fishing gear. North Carolina is the *only* state on the Atlantic coast that permits extensive trawling in inshore estuarine waters. It is no surprise that the highest levels of bycatch of juvenile species in North Carolina waters are found in the

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[3] *See Draft Amendment 2* at 236 ("If it chose to do so, the NCMFC may ask the legislature to limit participation in the shrimp trawl fishery to potentially reduce bycatch of these species. . . . If the areas where shrimp trawls can be used are significantly reduced, then limited entry may become more important as fishing effort will become concentrated in smaller areas.").

[4] *Estuarine Benthic Habitat Mapping Program – Shellfish and Submerged Aquatic Vegetation*, N.C. DEP'T OF ENV'TL QUALITY, http://portal.ncdenr.org/web/mf/shellfish-habitat-mapping (last visited June 24, 2021).

[5] *See North Carolina Coastal Habitat Protection Plan: Source Document*, N.C. DEP'T OF ENVT'L QUALITY, 11 (2016), *available at* http://portal.ncdenr.org/c/document_library/get_file?uuid=5d02ccd2-3b9d-4979-88f2-ab2f9904ba61&groupId=38337 [hereinafter *CHPP*].

Pamlico Sound, which is a highly productive nursery area for several species of finfish and other invertebrates such as blue crabs and horseshoe crabs.[6]

Commercially and recreationally valuable species, including Atlantic croaker, spot, weakfish, and southern flounder are in unknown, depleted, and/or overfished status, and fisheries managers have struggled to mitigate further decline in these stocks.[7] In fact, these species also account for the vast majority of finfish bycatch in North Carolina waters.[8] Bycatch mortality in North Carolina's shrimp trawl fishery contributes to the declining status of these important populations.[9] Currently, hundreds of millions of juvenile fish fall victim to shrimp trawl bycatch each year, and therefore do not spawn, replace themselves, and contribute to the adult population. Increasing juvenile recruitment is critical to rebuilding the stock and age structure of these species.[10]

Atlantic croaker, spot, weakfish, and southern flounder, among other estuarine-dependent species, spawn in coastal and near-shore ocean waters and recruit as early juveniles in estuarine habitats like the Pamlico Sound.[11] The majority of the individuals found in the Pamlico Sound are juvenile fish that have yet to spawn or have not reached their full spawning potential.[12] Harvesting or otherwise subjecting these juveniles to high levels of fishing mortality before first spawning leads to recruitment overfishing and growth overfishing, and may ultimately impact fishery yields and long-term stock productivity.[13]

The results of the annual Pamlico Sound Survey consistently indicate high levels of abundance of Atlantic croaker, spot, and weakfish in the Pamlico Sound.[14] Moreover, length

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[6] Despite repeated claims by the Division of Marine Fisheries and industry representatives that North Carolina has made progress in shrimp trawl bycatch reduction as the result of Bycatch Reduction Device ("BRD") testing and implementation, the Federation is unaware of any science that indicates these devices function as anything other than a trawl efficiency device. The Federation has not found evidence to suggest that BRD use increases the number of juvenile fishes that escape the estuarine trawling grounds and enter the adult stock. In fact, the sole reliance on these devices to reduce bycatch has borne little fruit and provided few quantifiable benefits to affected fish populations (e.g., spot, croaker, southern flounder).

[7] *Weakfish*, N.C. DIV. MARINE FISHERIES, http://portal.ncdenr.org/web/mf/Weakfish-sso (last visited May 20, 2019); *Atlantic croaker*, N.C. DIV. MARINE FISHERIES, http://portal.ncdenr.org/web/mf/atlantic-croaker (last visited May 20, 2019); *Spot*, N.C. DIV. MARINE FISHERIES, http://portal.ncdenr.org/web/mf/Spot-sso (last visited May 20, 2019); *Southern Flounder*, N.C. DIV. MARINE FISHERIES, http://portal.ncdenr.org/web/mf/southern-flounder#Stock (last visited May 20, 2019)

[8] Kevin Brown, *Characterization of the commercial shrimp otter trawl fishery in the estuarine and ocean (0-3 miles) waters of North Carolina: Final Report to the National Fish and Wildlife Foundation and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service*, N.C. DEP'T OF ENVTL. QUALITY 14, 17 (Oct. 2015).

[9] *See* Jack Travelstead & Louis Daniel, *A technical review of a proposal submitted by the North Carolina Wildlife Federation to reduce mortality of juvenile fishes in North Carolina* (Nov. 2016) (Exhibit B to N.C. Wildlife Federation Petition for Rulemaking (May 20, 2019), attached), at 2.

[10] *Id.*

[11] *See* Luiz Barbieri, *Technical Review: The Need to Reduce Fishing Mortality and Bycatch of Juvenile Fish in North Carolina's Estuaries* (Nov. 2016) (Exhibit E to N.C. Wildlife Federation Petition for Rulemaking (May 20, 2019), attached), at 9 (citing Lowerre-Berbieri et al. 1995, Barbieri et al. 1994a, Weinstein and Walters 1981, Chao and Musik 1977).

[12] *See id*.

[13] *See id.* at 11-12.

[14] *See* Travelstead & Daniel, *supra* note 9, at 10–11 (citing Knight and Zapf 2015).

frequency data suggests that the vast majority of the fish found in the Pamlico Sound are juveniles that have not yet reached maturity.[15] These results are consistent with the Division of Marine Fisheries' characterization studies conducted in inshore waters south of the Pamlico Sound and in ocean waters.[16] In addition, physical habitat characteristics, including bottom type, salinity, and temperature, support the growth of juveniles into adulthood in inshore and ocean waters.[17]

Juvenile populations of Atlantic croaker, spot, and weakfish, among many other species, are subjected to intense fishing pressure in the shrimp trawl fishery in North Carolina waters. Ninety-two percent of shrimp landings in state waters are harvested with otter trawls.[18] Otter trawls catch essentially everything in their path, leading to extraordinarily high levels of bycatch, even when bycatch reduction devices are properly installed. In addition, otter trawls disturb the sea or sound floor, which are fragile and productive ecosystems. A legislative panel pre-dating the Fisheries Reform Act found that bottom trawling gear, including shrimp trawls, had the greatest potential to impact bottom habitats in estuarine and coastal waters.[19] These impacts include physical disruption of habitat, changes in functional organization of species, increases in total suspended solids and turbidity, destruction of submerged aquatic vegetation, and decreases in habitat complexity.[20]

Habitat protection for juvenile fish is also lacking. Nursery areas serve as vital habitat areas for the development of finfish and shellfish species from early larval to late juvenile life stages. Nursery habitat supports high abundance levels and diversity of fish species, and the ecological processes that occur in nursery habitat support growth of individual fish. For decades, researchers have recognized the importance of nursery areas for juvenile life stage development. Estuarine nursery areas have been shown to contribute disproportionately to the production of individual fish that recruit into adult populations.[21]

In North Carolina, designated Primary Nursery Areas, Permanent Secondary Nursery Areas, and Special Secondary Nursery Areas are afforded protection; however, existing designations fail to account for all habitat areas that serve as nurseries. This is in spite of the fact that the MFC has recognized that "nursery areas need to be maintained . . . in their natural state,

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[15] *See id*. Abundance is the most important variable in determining the presence of nursery areas. *See Amendment 1 to the North Carolina Shrimp Fishery Management Plan*, N.C. DIV. MARINE FISHERIES, 170 (2015), http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=24626903&name=DLFE-134540.pdf [hereinafter *Amendment 1*], at 169.

[16] *See* Travelstead & Daniel, *supra* note 9, at 11 (citing Brown 2015, Knight 2015, Knight and Zapf 2015, Brown 2009, Johnson 2006, Logothetis & McCuiston 2004, Johnson 2003, Diamond-Tissue 1999).

[17] *See id*. at 12.

[18] *See* Brown, *supra* note 8, at 1.

[19] *See CHPP*, *supra* note 5, at 163.

[20] *See CHPP*, *supra* note 5, at 163–67.

[21] *See* Barbieri, *supra* note 11, at 5 (citing Able 2005, Beck, et. al., 2001, Heck and Crowder 1991); *see also* Lefcheck, et al., *Are coastal habitats important nurseries? A meta-analysis*, CONSERVATION LETTERS (2019); e12645. https://doi.org/10.1111/conl.12645 (Exhibit M to N.C. Wildlife Federation Petition for Rulemaking (May 20, 2019), attached).

and the populations within them must be permitted to develop in a normal manner with as little interference from man as possible."[22]

Critical ecosystem services are also lost as a result of sustained high bycatch levels.[23] Atlantic croaker, spot, weakfish, and southern flounder serve an important role in the trophic structure of the state's fisheries resources. Spot and Atlantic croaker, for example, transfer energy from benthic species (their primary diet component) to other economically valuable species, including spotted seatrout, red drum, and southern and summer flounder. [24] Removing significant levels of juvenile fish in shrimp trawls disadvantages higher-level species. The trawling activity itself compounds this effect, as bottom disturbing gear disrupts bottom habitat and bottom-dwelling benthic communities.[25]

The MFC's efforts to minimize bycatch of juvenile finfish have proven unsuccessful to date. The MFC fell far short of taking meaningful action to protect important habitat areas and reduce bycatch of juvenile fish in Amendment 1 to the Shrimp Fishery Management Plan and has done little since the adoption of Amendment 1 to address this important issue.[26] The Federation hopes that the MFC can change this with the management measures it will adopt in Amendment 2.

DRAFT AMENDMENT 2

The primary objectives for Amendment 2 are to reduce bycatch and protect habitat. Specifically, Draft Amendment 2 states that the "goal of Amendment 2 to the N.C. Shrimp FMP is to manage the shrimp fishery to provide adequate resource protection, optimize long-term harvest, and minimize ecosystem impacts."[27] The document goes on to state that the following objectives will be used to achieve this goal:

> (1) Reduce bycatch of non-target species of finfish and crustaceans, as well as protected, threatened, and endangered species.
> (2) Promote the restoration, enhancement, and protection of habitat and environmental quality in a manner consistent with the Coastal Habitat Protection Plan (CHPP).
> (3) Develop a strategy through the CHPP to review current nursery areas and to identify and evaluate potential areas suitable for designation.
> (4) Use biological, environmental, habitat, fishery, social, and economic data needed to effectively monitor and manage the shrimp fishery and its ecosystem impacts (i.e., bycatch, habitat degradation).

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[22] *See Amendment 1 to the North Carolina Shrimp Fishery Management Plan*, N.C. DIV. MARINE FISHERIES, 170 (2015), http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=24626903&name=DLFE-134540.pdf [hereinafter *Amendment 1*], at 168; *see also* 15A N.C. Admin. Code 3N .0104-0105 (2019).
[23] *See* Barbieri, *supra* note 11, at 9.
[24] *See* Travelstead & Daniel, *supra* note 9, at 12.
[25] *See id*. at 15; *see also* Barbieri, *supra* note 11, at 11.
[26] *See generally Amendment 1*, *supra* note 22.
[27] *See Draft Amendment 2* at 8.

(5) Promote implementation of research and education programs designed to improve stakeholder and the general public's understanding of shrimp trawl bycatch impacts on fish population dynamics.[28]

The amendment is framed by an introduction followed by a series of appendices that address the specific issues and management options.

I. DRAFT AMENDMENT 2 IGNORES THE BEST AVAILABLE SCIENCE ON ECOSYSTEM PROTECTION.

A key component of Draft Amendment 2's introduction section is its discussion of "Ecosystem Protection and Impacts."[29] Much of this discussion, which relies on discredited data, is taken verbatim from the fiscal note that DMF previously prepared in response to the Federation's November 2016 Petition for Rulemaking, after the MFC voted to approve the petition in February 2017.[30] The Federation provided extensive comments critiquing exactly this issue in the fiscal note. Despite this, this section of Draft Amendment 2 continues to promote a definition of nursery areas that is inconsistent with the literature and the unique circumstances in North Carolina.

In both the fiscal note[31] and Draft Amendment 2,[32] DMF defines a new "concept" of nursery areas based on the work of Beck et al. (2001), Dahlgren et al. (2006), and Peterson (2003), under which DMF defines "nursery areas" as merely "a subset of juvenile habitat that contributes disproportionally more to the production of juveniles that recruit into a population than another area of similar size."[33] Based on this concept, DMF goes on to claim that "[w]hile all waterbodies may have juvenile fish present at any given time, a combination of factors may not align, resulting in low nursery value (Beck et al. 2001; Peterson 2003)."[34] By contrast, DMF claims that most "optimal nursery areas" (defined by DMF as occurring "where ideal abiotic factors, structured habitat, and landscape position overlap") already restrict shrimp trawling "through habitat designations and area and gear restrictions."[35] Yet nowhere are these areas specifically mapped or delineated.

The concept of nursery areas articulated by DMF in Draft Amendment 2 suggests that if vital habitat areas cannot meet all the standards for classification as "optimal nursery areas," then there is little to no need to protect them.[36] This suggestion appears to be little more than a post-hoc attempt by the agency to justify the ongoing lack of adequate protection for the nursery areas that it now classifies as being sub-optimal in value. Furthermore, the concept articulated by

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[28] *Id.*
[29] *See id.* at 23–27.
[30] *See* N.C. DIV.MARINE FISHERIES, FISCAL IMPACTS OF PROPOSED RULES FROM PETITION FOR RULEMAKING SUBMITTED BY NORTH CAROLINA WILDLIFE FEDERATION, 27 (Jan. 4, 2019) [hereinafter Fiscal Note], *available at* https://files.nc.gov/ncosbm/documents/files/DEQ_2019-01-04.pdf.
[31] *See id.* at 27.
[32] *See Draft Amendment 2* at 25–26.
[33] *Id.*
[34] *Id.* at 26.
[35] *Id.*
[36] *Id.* at 25–26.

DMF conflicts with controlling state regulations, which simply define primary nursery areas as "those areas in the estuarine system where initial post-larval development takes place" and secondary nursery areas as "those areas in the estuarine system where later juvenile development takes place." 15A N.C. Admin. Code 3I. 0101.[37]

While we agree that some habitats may be more important than others, the Coastal Habitat Protection Plan (CHPP) argues that all of the various habitat types, including soft bottom habitats, provide the basis for long-term fish production and that the integrity of the entire system depends upon the health of areas and individual habitat types within the system.[38] We find DMF's new position and characterization of nursery habitat protection to be dangerously flawed.

Moreover, DMF is fully aware, and has been previously alerted by the Federation, that the studies used to support its new nursery area definition, including work by Dahlgren et al. (2006), were refuted by the later work, published in the prestigious Marine Ecology Progress Series, of Sheaves et al. (2006).[39] Sheaves et al. (2006) state:

> *The recent paper by Dahlgren et al. (2006), which builds on the earlier paper of Beck et al. (2001), proposes a classification system to identify important marine nursery habitats to aid in directing future research and to provide managers with a tool for the protection of important habitats. . . .* ***However, we believe that this approach is over-simplistic and does not account for many key aspects of nursery ground value. In particular, the approach focuses solely on one aspect of nursery ground function, the provision of a physical area of habitat occupied by juveniles, and one measure of importance, the proportion of individuals contributed by a nursery ground. Consequently, the nursery ground concept of Dahlgren et al. (2006) fails to (1) identify and account for the effects of scale, (2) recognize the importance of complexity and connectivity, (3) recognize the importance of ecosystems, resources and processes in supporting juveniles, and (4) recognize that the value of a nursery ground is a function of the reproductive output of individuals from the nursery and not just the numbers of individuals it provides. . . .*** *Dahlgren et al. (2006), and Beck et al. (2001) before them, measured the value of nursery grounds in terms of numbers contributed to adult populations, either the average number of individuals per unit area (Beck et al. 2001) or the proportion of individuals (Dahlgren et al. 2006).* ***This approach relates to the value of a nursery from a purely exploitive, short-term, fisheries perspective; it does not recognize that—in an evolutionary, ecological and a sustainable fisheries sense—it is the contribution to the production of succeeding generations that determines real nursery-ground value.***[40]

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[37] This regulatory definition, found in Chapter 3 (Marine Fisheries) of Title 15A of the Administrative Code, comports with the definition given under Chapter 10 (Wildlife Resources and Water Safety). *See* 15A N.C. Admin. Code 10C .0501-.0502. Changes in the MFC's definition could create additionally conflict with the rules of the Wildlife Resources Commission.

[38] *See CHPP*, *supra* note 5, at 133–37.

[39] Marcus Sheaves, et. al, Marine nurseries and effective juvenile habitats: an alternative view, MARINE ECOLOGY PROGRESS SERIES, Vol. 318: 303–306 (2006).

[40] *Id.* at 303 (emphasis added).

We concur with Sheaves et al. (2006) and believe DMF's interpretation once again fails to consider anything other than the impacts to the fishery. The Federation previously raised these specific points and scientific authorities with DMF, yet DMF has ignored Sheaves et al.'s refutation with no acknowledgment or explanation. This failure to explain the agency's rationale in clinging to a flawed definition is inexcusable, particularly when subsequent scientific papers have only continued to discredit it. For example, a subsequent article published by Sheaves et al. (2015) provides additional information that further contradicts the DMF's new nursery classification approach, as articulated in Draft Amendment 2.[41] Finally, DMF also fails to acknowledge that North Carolina's unique situation requires extra consideration of how to protect *all* nursery areas from the impacts of shrimp trawling because it is the *only* East Coast state that allows shrimp trawling in its nursery areas.

II. THE DIVISION'S SHRIMP TRAWL BYCATCH ASSESSMENT (APPENDIX 1) IMPROPERLY PRIORITIZES QUANTIFYING COSTS OF BYCATCH REDUCTION OVER BENEFITS.

Appendix 1, titled "Shrimp Trawl Bycatch Assessment," begins with a discussion on methods to characterize bycatch and the difficulties encountered in applying these methods.[42] The discussion indicates that DMF does not, in its judgment, currently have sufficient data to produce accurate estimates of shrimp trawl bycatch; therefore, DMF claims that it cannot quantify reductions achieved from any management option.[43]

Further, Appendix 1 states that the amount of bycatch is "*meaningless in the absence of a population estimate from a stock assessment*,"[44] and that a "stock assessment is needed that produces estimates of stock size to determine if there is *any* positive population impacts of reducing bycatch."[45] In fact, the section concludes that for some species such as spot, Atlantic croaker, and weakfish, "any benefits to inshore fisheries may not be realized even with reductions in bycatch."[46] The final concluding summary provided by DMF at the end of Appendix 1 states that "[r]educing shrimp trawl bycatch alone is often not enough to recover an overfished stock."[47]

The Federation poses the following questions to DMF for its consideration in selecting its recommended measures:

1. How does DMF know that the reduction of bycatch alone is often not enough to recover an overfished stock? Or, that substantive reductions would not improve stock condition?

2. Does the DMF acknowledge that significant ecosystems improvement occurs by reducing bycatch mortality?

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[41] Marcus Sheaves, et al., *True Value of Estuarine and Coastal Nurseries for Fish: Incorporating Complexity and Dynamics*, 38 ESTUARIES AND COASTS 401 (2015) (Exhibit J to N.C. Wildlife Federation Petition for Rulemaking (May 20, 2019), attached).
[42] *See Draft Amendment 2* at 38.
[43] *Id.* at 43.
[44] *Id*. (emphasis added).
[45] *Id.* at 44.
[46] *Id.*
[47] *Id.* at 47.

3. The age, size structure and landings of spot, croaker, and weakfish have declined precipitously for the past 2-3 decades. Recreational and commercial landings have declined by 85%+, and the majority of the harvest of spot and croaker are juvenile fish. The number of fish harvested for all three species is less than 10 million fish, yet the estimates of bycatch from Brown 2015, a DMF study that provides the best estimates of the magnitude of shrimp trawl bycatch in the North Carolina fishery but is ignored by DMF, indicates shrimp trawl mortality of these three species to be on the order of 150-200 million fish per year. How can DMF logically conclude that addressing 90% of the mortality on overfished and depleted stocks would not increase the abundance, health, productivity, and yield of these stocks for the benefit of North Carolinians?

4. Is there any evidence that shrimp trawl bycatch provides any benefit to the State?

III. THE MANAGEMENT OPTIONS PRESENTED IN APPENDIX 2 DO NOT PROVIDE SUFFICIENT OPTIONS TO REDUCE BYCATCH.

Appendix II contains several issue papers in which the management options presented for consideration are discussed.

A. Options to Modify or Create New Shrimp Trawl Closure Lines to Protect Sea Grass and Shell Bottom Habitats (Appendix 2.1)

Appendix 2.1, "Management of Shrimp Trawling for Protection of Critical Sea Grass and Shell Bottom Habitats," discusses how to protect submerged aquatic vegetation (SAV) and shell bottom habitat in areas from Core Sound and South from damage by shrimp trawls.[48] The management options considered include: (1) maintaining the status quo (maintain the areas currently open to shrimp trawling as identified in current rules and proclamations); (2) modifying existing shrimp trawl closure lines or creating new shrimp trawl closure lines with the goal of protecting additional SAV habitat; and/or (3) modifying existing shrimp trawl closure lines or creating new shrimp trawl closure lines with the goal of protecting additional shell bottom habitat.[49]

The Federation is concerned that Pamlico Sound, the area where the majority of shrimp trawling activity takes place and an area with substantial SAV and shell bottom, is excluded from consideration in these options. Additionally, we question why areas of shell bottom and SAV currently open to trawling have not been closed under the Director's proclamation authority if those areas are known and this action is available. Without addressing the Pamlico Sound, the options presented in Appendix 2.1 can do little to reduce the impacts of trawling on habitat and nothing to reduce bycatch at the population level.

In essence, the options contained in Appendix 2.1 appear to be options that will delay any meaningful actions to actually accomplish the stated goals and objectives of Amendment 2.[50]

[48] *Draft Amendment 2* at 57–95.
[49] *Id.* at 69–70.
[50] *See id.* at 8.

None of the options discussed in Appendix 2.1 could be tested to determine if the measures provided any quantitative benefits to the resource.

DMF's list of potential negative impacts of the options listed in Section VII of Appendix 2.1 confirms many points the Federation has made over the last several years. The list of *potential* negative impacts developed by DMF for protecting additional areas of shell bottom and SAV habitat include that the management actions "*could* shift effort to other areas" or "*may* decrease some traditional shrimp trawling areas" and that a "[m]odification of existing closure lines *could* cause confusion."[51] Conversely, the likely and *expected* positive impacts of the actions would decrease damage to SAV, decrease damage to shell bottom, and reduce bycatch. A precautionary management approach dictates that these management measures should be taken.

The Federation supports all of the closed areas, in their entirety, contained in Figures 2.1.3 through 2.1.5, 2.1.7, and 2.1.9. We must clarify, however, that we do not believe these actions will provide any significant benefits to the resource or reduce bycatch at the population level. Despite that, they would be an improvement from the status quo.

B. Options to Establish Static Shrimp Trawling Seasons and/or Change Special Secondary Nursery Areas to Permanent Secondary Nursery Areas (Appendix 2.2)

Appendix 2.2, "Shrimp Management in Special Secondary Nursery Areas,"[52] discusses measures to reduce bycatch in special secondary nursery areas (SSNAs), and indicates that most SSNAs are now closed to shrimp trawling and that the amount of bycatch reduction from a permanent closure is non-quantifiable.

The management options presented in Appendix 2.2 include: (1) maintaining the status quo for SSNA management; (2) establishing static seasons for shrimp trawling in some or all SSNAs; or (3) converting all SSNAs to permanent secondary nursery areas.[53]

The static season option, as stated by DMF, does not protect habitat.[54] Further, static seasons do not consider the significant year to year variability in shrimp abundance and distribution, or the abundance of juvenile fishes. Consequently, a static season may not reduce bycatch at all but may actually increase bycatch if SSNAs that typically remain closed are opened under a static season that requires no sampling to verify that an opening is appropriate.

The potential negative impacts listed by DMF for converting existing SSNAs to permanent secondary nursery areas further confirm that, as the Federation has repeatedly stated, the adverse effects of area closures are either minimal or uncertain, and are greatly outweighed by the positive effects. For example, the list of potential negative impacts developed by the DMF includes: "eliminat[ing] crab trawling when the areas are open;" "loss of income to commercial fishermen and dealers;" an alleged inability to "assess benefits of bycatch reduction

[51] *Id.* at 70.
[52] *Id.* at 96–120.
[53] *Id.* at 102.
[54] *Id.*

on fish stocks with current data;" and a concern that the measures "may adversely impact some fisherman more than others."[55]

The positive impacts of converting existing SSNAs to permanent secondary nursery areas are to "eliminate bycatch from shrimp trawls in all SSNAs" and "protect[] habitat from bottom disturbing gear."[56] The Federation supports reducing bycatch and protecting habitat, consistent with the goals of the plan, by converting all SSNAs to permanent SNAs. Again, we find this option to have minimal impact on the actual goals of Amendment 2.[57]

C. Options for Area Closures to Increase Connectivity (Appendix 2.3)

Appendix 2.3, "Reducing Shrimp Trawl Bycatch Through Area Closures That Increase Connectivity Between Closed Areas,"[58] provides the most important changes that can be made to reduce bycatch from the North Carolina shrimp fishery. Throughout the discussion, however, DMF attempts to minimize or question the impacts of bycatch on important estuarine fisheries, despite also repeatedly stating that bycatch amounts are unknown.[59] Further, DMF states that existing management strategies have substantially reduced bycatch in the shrimp trawl fishery, while at the same time indicating that bycatch amounts are unknown, as are the effects at the population level.[60] This striking inconsistency should be further examined.

The Discussion section indicates that the options contained in Appendix 2.3 are just a "starting point" for discussion, a point not raised by the MFC during its May meeting when the commissioners debated the document and eventually approved it for public comment.[61] This language seems to suggest that the management option of complete area closures may be a paper exercise that DMF does not intend to fully consider. The Federation urges DMF to fully and seriously consider the option of complete closures as a management strategy and to make its recommendations based on the best biological science available to it, which supports area closures.

In Appendix 2.3, DMF states that bycatch reduction from area closures is unquantifiable and that population benefits to individual species are impossible to predict and that the "expected benefits of reducing bycatch to North Carolina inshore fisheries may never be realized."[62] This analysis is inconsistent with the best available science and principles of fisheries management. The premise of rebuilding overfished stocks is based on reducing mortality.

DMF continues its analysis of the area closures by stating that "the degree to which shrimp trawl bycatch impacts fish stocks at the population level is either unknown or thought to be minimal."[63] Yet, we know that shrimp trawl mortality is the greatest source of fishing

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[55] *Id.* at 102–03.
[56] *Id.*
[57] *See id.* at 8.
[58] *Id.* at 120–218.
[59] *See, e.g.*, *id.* at 129 ("Bycatch in the North Carolina shrimp trawl fishery . . . still occurs at a high level. However, the degree to which shrimp trawl bycatch impacts fish stocks at the population level is either unknown or thought be minimal.").
[60] *Id.*
[61] *Id.* at 125.
[62] *Id.*
[63] *Id.*

mortality for spot, croaker, and weakfish by number.[64] Further, we estimate that the number of southern flounder taken as shrimp trawl bycatch exceed the total commercial and recreational catch, by numbers.[65]

To support its proposed measures, the issue paper contains an analysis to determine "hot spots" for common bycatch species in the Pamlico Sound.[66] Interestingly, the DMF analysis shows that all of Pamlico Sound is a hot spot for one species or another and in many cases distributions overlap creating even hotter spots. Based on these data and the available literature that contradicts the DMF proposed nursery area definitions,[67] we believe that the Pamlico Sound should be classified as a nursery area. DMF has indicated in Draft Amendment 2 that it considers it "inappropriate to designate nursery areas through the shrimp FMP process prior to a thorough scientific review."[68] However, the Federation supports closing the Pamlico Sound to shrimp trawling even in the absence of additional nursery area designations, until such designations can be made.

Appendix 2.3 provides the following management options for the Pamlico Sound: (1) maintain the status quo, with no additional area or seasonal closures; (2) create a "no shrimp trawl" buffer with seasonal extension (Figure 2.3.17); or (3) complete closure.[69] The benefits of the complete closure include reduced bycatch, reduced conflict, increased area for juvenile fish to disperse into larger water bodies, and habitat protection.[70] These benefits seem to contradict everything the DMF has argued up until now, including unknown impacts of reducing bycatch or eliminating trawling.

The buffer zone options proposed for Pamlico Sound (*see* Figures 2.3.16 and 2.3.17), would close a large portion of western Pamlico Sound.[71] This is a definite step forward; however, DMF must consider how this option actually comports with the objective to increase connectivity between closed areas. The finfishes and blue crabs protected in those proposed closed areas would be subjected to intense trawl pressure in the remaining open portions of Pamlico Sound.[72] The proposed buffers only delay mortality until the fishes and crabs migrate back in to open trawl areas. Those animals that make it past the open areas and reach the eastern Pamlico Sound closures, highlighted in green behind the outer banks, will once again be

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[64] *See* Atlantic States Marine Fisheries Commission, Review of the Interstate Fishery Management Plan for Spot (*Leiostomus xanthurus*), 2018 Fishing Year (June 2020) [hereinafter ASMFC Spot FMP Review], *available at* http://www.asmfc.org/uploads/file/5f9ae1812018SpotFMP_Review.pdf; Atlantic States Marine Fisheries Commission, Review of the Interstate Fishery Management Plan for Atlantic Croaker (*Micropogonias undulatus*), 2019 Fishing Year (Oct. 2020) [hereinafter ASMFC Croaker FMP Review], *available at* http://www.asmfc.org/uploads/file/5fa05510AtlCroakerFMPreview_FY2019.pdf; Atlantic States Marine Fisheries Commission, Review of the Interstate Fisheries Management Plan for Weakfish (*Cynoscion regalis*), 2019 Fishing Year (May 2021) [hereinafter ASMFC Weakfish FMP Review], *available at* *http://www.asmfc.org/uploads/file/60a42ab32019WeakfishFMP_review.pdf*; *see generally* Travelstead & Daniel, *supra* note 9.

[65] *See* Brown, *supra* note 8.

[66] *Draft Amendment 2* at 192–218 (Appendix 2.3A, "Hot Spot Analysis").

[67] *See, e.g.*, Sheaves, et. al (2006), *supra* note 39 at 303–06; Sheaves, et al. (2015), *supra* note 41.

[68] *Draft Amendment 2* at 153. DMF goes on to state that "shrimp trawl area closures can be considered based on information presented." *Id.*

[69] *Draft Amendment 2* at 133.

[70] *Id.*

[71] *See id.* at 132, 187–88.

[72] *See, e.g.*, *id.* at 166 (Table 2.3.8).

subjected to trawling once they enter the open area of the Atlantic Ocean.[73] We cannot see how the proposal would actually provide connectivity between closed areas on the charts. Fishes and crabs moving offshore will ultimately encounter open areas where they are subjected to bycatch mortality.

Given the management recommendations proposed, the Federation supports the total closure of all inside waters to shrimp trawling. The buffer zone option would only provide a short, biologically insignificant delay in potential bycatch mortality. Ideally, corridors or buffers would be established around all inlets to reduce the bycatch of the fishes during outmigration.

Furthermore, while the total closure to inside waters provides the greatest reductions of bycatch and protection of habitat, it is not a panacea. High levels of bycatch will still occur in the open ocean waters. However, the larger juvenile fish that out-migrate, coupled with the more open areas and escapement routes to offshore overwintering or spawning areas would, in our judgement, have significant, positive impacts on population levels, spawning stock biomass, and fishery yield.[74]

While the Federation supports the total closure to shrimp trawls, we would recommend continued allowance for skimmer trawls, channel nets, shrimp pounds, and cast nets. A closure of Pamlico and Core Sound alone would provide a great step forward toward realizing the goals of Amendment 2.

D. Options for Effort and Gear Restrictions (Appendix 2.4)

Appendix 2.4, "Managing Effort and Gear in the North Carolina Shrimp Fishery to Reduce Bycatch," provides another summary of bycatch information and characterizes the bycatch of various species in shrimp trawls.[75] The Federation takes exception to how this information is presented. The options offered in this section are presented as merely a menu of available options under the umbrella of "managing effort and gear," but the impacts of each option are sufficiently important that they deserve stand-alone consideration.

Furthermore, Appendix 2.4's discussion on bycatch selectively presents data in a misleading and confusing way. For example, the discussion emphasizes declines in incidental landings of non-target species by shrimp trawls, but fails to emphasize that measures of incidental landings account only for *retained* catch from shrimp trawls, not any discarded catch. Even worse, the discussion fails to make clear that only the portion of retained catch that is actually *sold* is included in data on incidental landings.[76] The document once again provides examples of the efforts that have been made in North Carolina to reduce bycatch, none of which can be shown to have reduced bycatch at the population level at all.[77]

We also take exception to the continued reliance on South Atlantic Shrimp Trawl bycatch estimates to characterize the impacts of shrimp trawling in North Carolina estuarine nursery areas.[78] The South Atlantic data are taken from the Atlantic Ocean and are meaningless when estimating bycatch in the confines of the estuarine nursery grounds. We also find it disingenuous

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[73] *See id.* at 187–88.
[74] *See, e.g.*, *See* Travelstead & Daniel, *supra* note 9.
[75] *Draft Amendment 2* at 219–30.
[76] *Id.* at 221.
[77] *Id.* at 222–23.
[78] *See, e.g.*, *id.* at 223 (Atlantic croaker), 225 (spot), 226 (weakfish).

to continue to suggest that at net mortality ranges from 0% to 57%. Again, this information is both inaccurate and misleading. These statements in the sections on characterization studies suggest that 0% to 57% of the bycatch survives their encounter with a shrimp trawl.[79] Nowhere is it explained that the Atlantic States Marine Fisheries Commission (ASMFC) considers bycatch in trawl fisheries, even on adult fishes, as 100%. To believe DMF's estimates, one has to believe that after a fish gets through a Bycatch Reduction Device (BRD), it will swim away and never get caught in one of many thousands of tows during the season. DMF's estimate is mathematically improbable. Further, this bycatch model assumes that nothing is eaten when it squeezes through the meshes on haul back, nothing perishes after spending an hour or more on a hot deck before being discarded, that finfish and marine mammal predators are not following the net and consuming juveniles that exit a BRD, or that birds and predators don't consume everything that is dumped off the back deck after culling. While there are certainly uncertainties associated with trying to project how much of any avoided bycatch would recruit to future fisheries, it is reasonably safe to presume that little if any of the current bycatch survives to be caught in the future.

The issue paper at Appendix 2.4 suggests that the biggest unanswered question is "How much bycatch is there?" This question cannot be, and may never be, answered with the specificity that DMF and the MFC seek. But as the State continues to delay action in addressing this critical problem, the best available data show increasingly concerning trends. What we do know is that bycatch mortality from shrimp trawls dwarfs the mortality of other sources in terms of numbers of dead fish for many species important to North Carolina.[80] As pointed out in the issue paper, the MFC adopted a policy in 1991 to reduce bycatch losses to the absolute minimum.[81] Thirty years later, DMF says it cannot provide any estimates for the greatest source of discard mortality on the east coast of the United States, despite possessing useful proxies,[82] and uses that failure as justification to delay taking action. The time and effort spent in the Amendment 2 defending the State's rejection of the precautionary approach is alarming.[83]

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[79] *Id.* at 224.

[80] Atlantic States Marine Fisheries Commission, Review of the Interstate Fishery Management Plan for Spot (*Leiostomus xanthurus*), 2018 Fishing Year (June 2020), *available at* http://www.asmfc.org/uploads/file/5f9ae1812018SpotFMP_Review.pdf; Atlantic States Marine Fisheries Commission, Review of the Interstate Fishery Management Plan for Atlantic Croaker (*Micropogonias undulatus*), 2019 Fishing Year (Oct. 2020), *available at* http://www.asmfc.org/uploads/file/5fa05510AtlCroakerFMPreview_FY2019.pdf.

[81] *Id.* at 221 ("[I]n 1991 the North Carolina Marine Fisheries Commission (NCMFC) adopted a policy directing the division to establish the goal of reducing bycatch losses to the absolute minimum and to consciously incorporate this goal into all management considerations (Murray et al. 1992).").

[82] *See* Brown, *supra* note 8.

[83] The precautionary approach has been widely accepted as the preferred approach for the management of marine fisheries in the face of uncertainty, contrary to established management principles. Notably, Principle 15 of the Rio Declaration of the United Nations Conference on Environment and Development provides that "in order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental damage." UNITED NATIONS, Report of the United Nations Conference on Environment and Development (June 1992), http://www.un.org/documents/ga/conf151/aconf15126-1annex1 htm *See also* FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, The Precautionary Approach to Fisheries and Species Introductions 6-7 (1999), http://www fao.org/3/a-w3592e.pdf; FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, The Precautionary Approach

i. Limited Entry

The disjointed selection of management options presented in Appendix 2.4 begins with Limited Entry.[84] The DMF states that "*[c]apping or reducing fishing effort can protect the biological viability of a species and the economic integrity of the fishery*,"[85] which is the goal of the FMP. The option further describes limited entry as the "most effective way to limit effort in the shrimp trawl fishery."[86] Based on these statements, it appears clear that the DMF must recommend this course of action.

ii. Headrope Limits

Appendix 2.4's management options also include gear and time restrictions to reduce effort and bycatch. These options include headrope length reductions, reduced fishing days, fishing times, tow times, and trip limits.[87]

DMF states that limits on headrope length "may reduce"[88] bycatch for at least "some species."[89] We contend it would help for all. DMF seems to ignore the primary impetus behind the Federation's previous suggestions to reduce headrope length.[90] We contend that reduced head rope length would reduce effort and bycatch; neither the DMF nor MFC have refuted this claim with any peer-reviewed data. The primary justification for a reduced headrope limit in the estuarine nursery grounds is to dissuade large trawlers, especially those trawlers from out of state, from fishing in those nursery areas at all. Keeping the large trawlers in the ocean reduces significant effort on the nursery grounds, reduces bycatch, and reduces conflicts with smaller, local shrimp trawlers.

The issue paper provides a summary of how other states regulate headrope, suggesting 220 feet is relatively consistent in South Carolina and Georgia.[91] These states, however, do not allow trawling in their well-defined estuarine nursery areas. To suggest there may be some comparison between what South Carolina and Georgia allow with North Carolina is misleading.

iii. Fishing Days Restrictions

The Federation supports fishing day restrictions to reduce effort, reduce bycatch, reduce turbidity, and standardize effort that cannot currently be measured. The attached petition provides detailed justification for closure days.[92] Specifically, we recommend that the fishery close on Tuesdays and Thursdays in addition to the current week-end closure. By allowing lay days during the week, current effort will be reduced by 40% with minimal recoupment.[93]

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to Fisheries and its Implications for Fishery Research, Technology and Management: An Updated Review (undated), http://www.fao.org/docrep/003/w1238e/w1238e01.htm.

[84] *Draft Amendment* 2 at 235.

[85] *Id.*

[86] *Id.* at 243.

[87] *Id.* at 237–41.

[88] *Id.* at 243.

[89] *Id.* at 238.

[90] *See* N.C. Wildlife Federation Petition for Rulemaking (May 20, 2019), attached.

[91] *Draft Amendment 2* at 238–39.

[92] *See* N.C. Wildlife Federation Petition for Rulemaking (May 20, 2019), attached.

[93] *See id.*

Studies by DMF indicate that rest days allows the shrimp to re-aggregate and allows for better catches on open days.[94]

iv. Daily Fishing Time Restrictions

Daily fishing time restrictions, supported by the Federation, reduces bycatch and is easy to enforce. The information provided in the draft is sparse,[95] and we would refer DMF and the MFC to our documents for a more thorough review.[96]

v. Tow Time Restrictions

Tow time restrictions reduce bycatch because "the longer you tow, the more you catch." The issue paper suggests, however, that reductions may not necessarily occur because fishermen would make additional tows.[97] No data is provided to support this claim. Yet the paper also points out that shorter tow times "could likely reduce bycatch mortality . . . by allowing [fish] to be released from the trawl more quickly."[98] Common sense would indicate that shorter tow times would result in less catch and less clogging of the nets and allow more escapement through appropriate mesh sizes and BRDs. Shorter tow times of 45 minutes, compared to hours, may actually allow some fishes and blue crabs to be released in a condition that they may avoid the swarming predators that follow the boats. Despite the clear benefits, DMF points to enforcement issues as a scapegoat for potential drawbacks of tow time limits. These concerns cannot reasonably outweigh the anticipated benefits that would still be expected to accrue from such measures, even with imperfect enforcement. The Federation supports a 45-minute tow time restriction.

vi. Trip Limits and Creel Limits

The last substantive item in this issue paper addresses trip limits.[99] The Federation has no position on trip limits.

vii. Other Gear Use

The conclusion to this issue paper is very important. DMF states that while all these options would reduce bycatch and mortality, "the necessary data do not exist to adequately quantify the full impact any of these regulations may have on bycatch reduction and survival as well as on the shrimp fishery and its associated industries."[100] The issue paper also indicates a concern with reducing fishing days that may disproportionately impact part-time shrimpers and holders of recreational commercial gear licenses (RCGLs).[101] The document reads as if it was written by the industry, using every opportunity to focus on uncertainties and incomplete data, rather than what we do know, in order to avoid taking any action that negatively impacts the industry.

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[94] *See id.*
[95] *See Draft Amendment 2* at 240.
[96] *See* N.C. Wildlife Federation Petition for Rulemaking (May 20, 2019), attached.
[97] *Draft Amendment 2* at 240–41.
[98] *Id.* at 240.
[99] *Id.* at 241.
[100] *Id.* at 242–43.
[101] *Id.* at 243.

What is known is that shrimp trawl bycatch is the number one source of waste and finfish mortality in the state, and the fisheries most impacted by shrimp trawl bycatch are collapsing.[102] What is also known is that tow times, headrope restrictions, fewer days fished, trawling only during the day, and expanding closed areas all reduce bycatch and may impact discard mortality.[103] But because the absolute impacts cannot be quantified, these management options, and the Federation's repeated recommendations, have been continuously discounted by DMF and the MFC in favor of maintaining what little economic value is left of the marine fisheries of this state.

IV. THE MFC'S DISCUSSION OF DRAFT AMENDMENT 2 INDICATES THAT THE DOCUMENT IS DEFICIENT.

At the conclusion of the DMF presentation of Draft Amendment 2 at the MFC's May 2021 business meeting, the scientist on the MFC immediately responded that he "found the FMP to be quite deficient and in no way ready for public comment." The Federation strongly agrees. The Federation is concerned that while Draft Amendment 2 presents a wide range of options, from maintaining the status quo to a total inside closure of all trawling, DMF has given no indication of which options are supported by the best available science.

Additionally, the Federation disagrees with several of the suggestions on habitat management made by commissioners at the meeting. One commissioner stated that he believed the best, long-term solution for habitat was the designation of Strategic Habitat Areas (SHAs). The Federation strongly disagrees. SHAs are but a minor fraction of the habitat that must be protected to reduce the extraordinary bycatch that occurs in the inshore North Carolina shrimp trawl fishery. Closing only this small fraction of habitat to shrimp trawling cannot possibly mitigate the bycatch from the thousands of acres of nursery habitat left open to trawling. The Federation takes even greater exception to the same Commissioner's suggestion that in the face of uncertainty, concern for economic impacts should prevail over a precautionary approach that favors conservation.

The meeting also failed to provide any clarity on nursery areas—another issue that should have been better resolved before Draft Amendment 2 went out for public comment. Several Commissioners acknowledge, and we agree, that the entire inside waters region is a nursery area.[104] At the meeting, however, DMF staff repeated their new contention that while juvenile

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[102] *See, e.g.*, Brown, *supra* note 8; ASMFC Spot FMP Review, *supra* note 64, ASMFC Croaker FMP Review, *supra* note 64; ASMFC Weakfish FMP Review, *supra* note 64.

[103] *See* Travelstead & Daniel, *supra* note 9.

[104] The DMF's own analysis, as presented to the Shrimp FMP Amendment 2 Advisory Committee, documents that is in fact the case. *See, e.g.*, DMF Presentation to Shrimp FMP Amendment 2 Advisory Committee: Reducing Shrimp Trawl Bycatch Through Area Closures that Increase Connectivity Between Closed Areas (Mar. 10, 2021), *available at* https://files.nc.gov/ncdeq/Marine-Fisheries/hot-topics/shrimp-amendment2/ac-workshops/4_Area_AC_20210310_FINAL-Area-Closures.pdf; DMF Presentation to Shrimp FMP Amendment 2 Advisory Committee: Management in Special Secondary Nursery Areas (Mar. 9, 2021), *available at* https://files.nc.gov/ncdeq/Marine-Fisheries/hot-topics/shrimp-amendment2/ac-workshops/3_SSNA_20210308_AC_FINAL-Shrimp-Management-Special.pdf ; DMF Presentation to Shrimp FMP Amendment 2 Advisory Committee: Overview (Mar. 2, 2021), at 21 *available at* https://files.nc.gov/ncdeq/Marine-Fisheries/hot-topics/shrimp-amendment2/ac-workshops/1_Shrimp_A2_Intro_202100301_AC_FINAL.pdf; DMF Presentation to Shrimp FMP Amendment 2 Advisory Committee: Review (Mar. 15, 2021), *available at*

fish are present throughout inside waters, this presence does not necessarily mean the inside waters are a nursery.[105] Staff further indicated that in order to declare a new nursery area, they would first need to assess new scientific criteria, including estimates of predator protection, escapement, and productivity.

As discussed above in Section I, the science on which DMF relies has been challenged and refuted by scientific reviews. The best science indicates that the occurrence of large concentrations of juvenile fishes vulnerable to shrimp trawls should be the sole criteria for protection in North Carolina.[106] Other states without inshore shrimping (i.e. *all* other states) may be able to be more selective in their nursery designations, but the new, questionable criteria put forth by DMF here do not fit the situation in North Carolina. The Federation hopes that DMF will recommend management actions to better protect all inshore waters from trawling, rather than continue to unnecessarily delay protections.

CONCLUSION

In summary, the Federation supports the total closure option presented in Draft Amendment 2 with caveats. Corridors in the Atlantic Ocean around inlets would greatly enhance the survival to offshore overwintering and spawning areas, thereby improving population biomass and sustainable fisheries yield.

As a less preferred alternative, the Federation believes that a combination of other options contained in Draft Amendment 2 could provide measured improvements in reducing bycatch. We would recommend the buffer options contained in Appendix 2.3, Figures 2.3.16 and 2.3.17, coupled with a 110-foot maximum headrope; shrimping only on Mondays, Wednesday, and Friday from sunrise to sunset; 45-minute tow times; and a formal recommendation to the General Assembly to allow limited entry in the shrimp trawl fishery. Additionally, we support converting all Special Secondary Nursery Areas to permanent Secondary Nursery Areas, closing all Strategic Habitat Areas to trawling, and utilizing the methods of Sheaves et al. (2005, 2016) to more accurately identify new nursery areas based on occurrence of juvenile fishes. Short of complete closure, these options provided the best opportunities to maintain a productive, inshore commercial shrimp fishery and protect our valuable public trust fishery resources.

Sincerely,

Tim Gestwicki
CEO
North Carolina Wildlife Federation

Attachment: N.C. Wildlife Federation Petition for Rulemaking (May 20, 2019) and Exhibits

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https://files.nc.gov/ncdeq/Marine-Fisheries/hot-topics/shrimp-amendment2/ac-workshops/Shrimp_A2_AC_Review_Final.pdf.

[105] *See Draft Amendment 2* at 25–26.

[106] *See, e.g.*, Sheaves, et. al (2006), *supra* note 39 at 303–06; Sheaves, et al. (2015), *supra* note 41.