IEFISHERY MANAGEMENT PLAN UPDATE
SHRIMP
AUGUST 2025

STATUS OF THE FISHERY MANAGEMENT PLAN

Fishery Management Plan History

Original FMP Adoption:	April 2006	
Amendments:	Amendment 1	February 2015
	Amendment 2	February 2022
Revisions:	Revision to Amendment 1	May 2018
	Revision to Amendment 1	May 2021
	Revision to Amendment 2	May 2024
Supplements:	None	
Information Updates:	None	
Schedule Changes:	None	
Comprehensive Review:	2027	

The N.C. Shrimp Fishery Management Plan (FMP) was adopted in April 2006 by the N.C. Marine Fisheries Commission (MFC; NCDMF 2006). The plan included a 90-foot headrope limit in some internal waters and area closures to protect habitats and juvenile finfish. Shrimp management by size was also developed to optimize the use of the resource. Other strategies were implemented to minimize waste through gear modifications, culling practices, and harvest restrictions. The plan allowed the use of skimmer trawls as a Recreational Commercial Gear License (RCGL) gear and established a 48-quart (heads-on) recreational limit. A restriction on the use of shrimp trawls above the Highway 172 Bridge over New River took effect in 2010 and this area above the bridge is limited to skimmer trawls only. This strategy was codified into rule through Amendment 1 in 2015.

Amendment 1 was adopted in February 2015 and was limited in scope to bycatch issues in the commercial and recreational fisheries (NCDMF 2015). The plan recommended a wider range of certified bycatch reduction devices (BRD) to choose from, and the requirement of two BRDs in shrimp trawls and skimmer trawls beginning June 1, 2015 (Proclamation SH-2-2015). It increased the daily harvest limit for cast nets in closed areas. Amendment 1 established a maximum combined headrope length of 220 feet in all internal coastal waters where there were no existing maximum combined headrope requirements, allowing for a phase-out period until January 1, 2017. Shrimp trawling was prohibited, effective May 1, 2015, in the Intracoastal Waterway (IWW) channel from the Sunset Beach Bridge to the South Carolina line, including the Shallotte River, Eastern Channel, and lower Calabash River, to protect small shrimp. Amendment 1 also permitted a live bait shrimp fishery so live bait fishermen with a permit could fish until 12:00 p.m. (noon) on Saturdays; effective May 1, 2017.

Amendment 1 introduced further industry testing of gears in shrimp trawls to reduce bycatch after adoption of the plan. An industry workgroup was formed to test gear modifications to reduce bycatch, to the extent practicable, with a 40% target reduction in the shrimp trawl fishery. Gear combinations with larger tailbag mesh sizes (>1 ½-inches), reduced TED grid size (3-inch), and larger fisheyes significantly reduced finfish bycatch. Four of the 12 gear combinations tested met or exceeded the 40% target reduction in finfish bycatch while also minimizing shrimp loss (Brown et al. 2017, 2018). Overall, finfish bycatch reductions ranged from 4.5% to 57.2%. Shrimp catch between the control and experimental nets ranged from a 16.2% loss to a 9.9% gain.

Results from the industry workgroup testing and recommendation were adopted as a revision to Amendment 1 by the MFC in May 2018 (NCDMF 2018). Under the May 2018 Revision to Amendment 1 and continued through Amendment 2 (NCDMF 2022) fishermen are required to use one of four gear combinations that achieved at least 40% finfish bycatch. The new gear configurations are required in all shrimp trawls, except skimmer trawls, used in inside waters where up to 220 feet of combined headrope is allowed (Pamlico Sound and portions of the Pamlico, Bay, and Neuse rivers) effective July 1, 2019, through Proclamation SH-3-2019 and continues through proclamation SH-1-2022. The commission also recommended to continue the shrimp industry workgroup and explore funding options for more studies, to survey fishermen to determine what bycatch reduction devices the shrimp trawl industry currently uses, and to begin development of Amendment 2 to the Shrimp FMP. In the fall of 2019, two gear configurations were tested in the Atlantic Ocean using the same methods and goals set forth by the MFC in Amendment 1, including a 40% target reduction of finfish bycatch above the industry standard gear at the time. One gear consisting of two inline federal fisheyes with a 1¾-inch tailbag met the management goal of a 40% reduction, achieving a 52% reduction in finfish bycatch. This gear was previously certified for use in the Pamlico Sound and is required in all shrimp trawls used in the Atlantic Ocean since July 1, 2022, through Proclamation SH-3-2022.

The North Carolina Wildlife Federation submitted a petition for rulemaking on November 2, 2016, and a modification to the petition on January 12, 2017. The Petitioner put forth seven rules to designate nursery areas, restrict gear and seasonality in the shrimp trawl fishery to reduce bycatch of fish (including spot, Atlantic croaker, and weakfish), and establish an 8-inch minimum size limit for spot and a 10-inch minimum size limit for Atlantic croaker. In February 2017, the MFC approved the petitioned rules to begin the rulemaking process. Upon review by the Office of State Budget and Management it was determined that sufficient state funds were not available to implement the proposed rule changes without undue detriment to the agency's existing activities and the rules were never adopted.

With the adoption of Amendment 1, a management strategy included the Habitat and Water Quality Advisory Committee to provide input on changing the designation of certain Special Secondary Nursery Areas (SSNAs) that had not been opened to trawling since 1991 to permanent Secondary Nursery Areas (SNAs). Due to overlapping issues associated with petitions for rulemaking related to nursery area designations and shrimp management the development of this management measure was delayed. The MFC selected to change the designation of 10 SSNAs that had not been opened to trawling in many years to permanent SNAs and in the May 2021 Revision to Amendment 1 (NCDMF 2021) the designation of SSNAs in Pungo, Scranton, Slade, South, Bond/Muddy, and Saucepan creeks as well as the Newport, Cape Fear and Lockwood Folly rivers were changed to permanent SNAs.

In August 2019, the FMP schedule moved the timeline forward one year to start development of Amendment 2. The goal of Amendment 2 is to further reduce bycatch of non-target species and minimize ecosystem impacts (NCDMF 2022). The MFC adopted the Shrimp FMP Amendment 2 in February 2022. The amendment retained measures implemented with the May 2018 and 2021 revisions to the Shrimp FMP Amendment 1 and implemented several management changes: 1) prohibit all trawling within all Crab Spawning Sanctuaries year-round (Proclamation SH-1-2023), 2) prohibit trawling in Bogue Sound and the Carolina Beach Boat Basin, except within the Intracoastal Waterway (Proclamations SH-1-2023 and SH-2-2023), 3) establish a single, state-wide recreational creel limit for cast nets (48 quarts, heads on or 30 quarts, heads off; Proclamation SH-4-2022), 4) change the flexible opening date in all SSNAs to a static Sept. 1, 5) continue collaboration with the industry workgroup to identify and test gear modifications to further reduce bycatch in the shrimp fishery, 6) provide for adaptive management for future action to address issues related to submerged aquatic vegetation identified through Division collaboration with the Coastal Habitat Protection Plan support staff, the Habitat and Water Quality Advisory Committee, and stakeholder groups, 7) maintain existing headrope limits for shrimp trawls in internal coastal waters but allow for adaptive management to resolve user conflicts, and 8) investigate the feasibility and use of a long-term shrimp trawl observer program that encompasses all seasons, areas, and gears (Table 1).

Table 1. Summary of management strategies and outcomes from N.C. Shrimp Fishery Management Plan Amendment 2.

Management Strategy	Implementation Status
Prohibit trawling within all Crab Spawning Sanctuaries.	Existing proclamation authority; Proclamations issued SH-1-2024 and SH-2-2024.
Prohibit trawling in Bogue Sound and the Carolina Beach Yacht Basin, except within the Intracoastal Waterway	Existing proclamation authority; Proclamations issued, SH-1-2023 and SH-2-2023.
Establish a single, state-wide recreational creel limit for cast nets (48 quarts, heads on or 30 quarts, heads off).	Existing proclamation authority; Proclamation issued, SH-4-2022.
Change the flexible opening date in all Special Secondary Nursery Areas to a static Sept. 1.	Existing proclamation authority; Proclamations issued SH-1-2024 and SH-2-2024
Continue collaboration with the industry workgroup to identify and test gear modifications to further reduce bycatch in the shrimp fishery.	Ongoing.
Investigate the feasibility and use of a long-term shrimp trawl observer program that encompasses all seasons, areas, and gears.	Ongoing. The MFC will seek additional methods and funding sources.
Provide for adaptive management for future action to address issues related to submerged aquatic vegetation identified through Division collaboration with the Coastal Habitat Protection Plan support staff, the Habitat and Water Quality Advisory Committee, and stakeholder groups.	Further management strategies will be developed under the authority of the MFC.
Maintain existing headrope limits for shrimp trawls in internal coastal waters but allow for adaptive management to resolve user conflicts.	No action required.

As part of the implementation of Amendment 2, an information paper was developed to investigate the feasibility and utility of a long-term shrimp trawl observer program to better estimate the magnitude and composition of discards in the North Carolina shrimp trawl fishery. While the division has conducted limited studies on shrimp trawl vessels using observers to characterize discards in the shrimp trawl fishery (e.g., Brown 2009, 2010, 2015, 2016, 2017, and 2018), participation was voluntary, and the limited scale and scope of these studies make them inadequate to quantify discards across the entire shrimp trawl fishery. At its February 2024 business meeting, the MFC voted to seek alternative methods of monitoring and multiple sources of funding in addition to the Commercial Fishing Resource Fund for a shrimp trawl observer program.

Additionally, an issue paper was developed to use adaptive management to protect SAV habitat, by identifying unprotected SAV habitat using updated imagery and providing additional protection through shrimp trawl area closures. In January 2024, the division presented the draft issue paper to the Habitat and Water Quality (HWQ) AC as requested by the MFC. The HWQ AC endorsed the division's initial recommendations to protect existing and prospective SAV habitat; however, they recommended that the division work with stakeholders to identify where SAV cannot be supported to minimize the impact on stakeholders while maximizing SAV protection. The HWQ AC further recommended that a monitoring program be established to measure the status of SAV habitat in NC. To address concerns raised by the

public and the HWQ AC, the division's recommendation was modified to include alternate closures and additional input from the Northern and Southern regional, and Shellfish/Crustacean ACs before making final recommendations to the MFC. DMF staff met with several stakeholders on April 8, 2024, to gain more informal input prior to the April 2024 MFC AC meetings. While the ACs acknowledged the need to protect SAV, they cited that shrimp trawling was not the primary threat to SAV and poor water quality as well as other bottom disturbing activities were also impactful to SAV (e.g., propeller scarring, anchoring, etc.). In May 2024, the MFC voted to accept the division's recommendation to develop more comprehensive management options to protect SAV habitat from all activities under the authority of the MFC, consistent with the CHPP. Action to address SAV protection under the Shrimp FMP Amendment 2 has concluded and the MFC's selected management strategy to protect SAV habitat under the authority of the MFC will serve as the May 2024 Revision to Amendment 2 to the N.C. Shrimp FMP (NCDMF 2024).

Management Unit

The management unit includes the three major species of shrimp: brown (*Farfantepenaeus aztecus*), pink (*F. duorarum*), and white (*Penaeus setiferus*) and its fisheries in all coastal fishing waters of North Carolina, which includes the Atlantic Ocean offshore to three miles.

Goal and Objectives

The goal of Amendment 2 is to manage the shrimp fishery to provide adequate resource protection, optimize long-term harvest, and minimize ecosystem impacts (NCDMF 2022). The following objectives will be used to achieve this goal.

- Reduce by catch of non-target species of finfish and crustaceans, as well as protected, threatened, and endangered species.
- Promote the restoration, enhancement, and protection of habitat and environmental quality in a matter consistent with the Coastal Habitat Protection Plan (CHPP).
- Develop a strategy through the CHPP to review current nursery areas and to identify and evaluate potential areas suitable for designation.
- Use biological, environmental, habitat, fishery, social, and economic data to effectively monitor and manage the shrimp fishery and its ecosystem impacts (i.e., bycatch, habitat degradation).
- Promote implementation of research and education programs designed to improve stakeholder and the general public's understanding of shrimp trawl by catch impacts on fish population dynamics.

DESCRIPTION OF THE STOCK

Biological Profile

There are three shrimp species that make up the fishery in North Carolina. They are the brown shrimp, pink shrimp, and white shrimp. The lifecycles of these species are similar in that adult shrimp spawn offshore and eggs are hatched into free-swimming larvae. Larvae develop through several stages into post-larvae. Once post-larval shrimp enter estuaries, growth is rapid and is dependent on salinity and water temperature. As shrimp increase in size, they migrate from the upper reaches of small creeks to deeper saltier rivers and sounds. By late summer and fall, they return to the ocean to spawn. Batchelder et al. (2024) note that patterns of seasonal use and function of estuarine nursery habitats of penaeid shrimp may be shifting as winter water temperatures rise in southeastern USA, potentially resulting in a more continuous reproductive strategy as observed in subtropical regions. The maximum life span of shrimp can range from 16 to 24 months and maximum size can range from seven to 11 inches, depending on species (Eldred et al. 1961; Gunter 1961; McCoy 1968, 1972; McCoy and Brown 1967; Williams 1984).

Stock Status

Population size is controlled by environmental conditions, and while fishing reduces the population size over the season, fishing is not believed to impact year class strength unless the spawning stock has been reduced below a minimum threshold level by environmental conditions. Because of high fecundity and migratory behavior, the three shrimp species are capable of rebounding from very low population sizes in one year to large populations the next, provided environmental conditions are favorable (MacArthur and Wilson 1967; McCoy and Brown 1967; McCoy 1968, 1972; Perez-Farfante 1969; Purvis and McCoy 1972; Whitaker 1981, 1982, 1983; Morley et al. 2022; Schlenker et al. 2023).

Stock Assessment

Estimates of population size are not available but since the fishery is considered an annual crop and fished at near maximum levels, annual landings are probably a good indication of relative abundance. Annual variations in catch are presumed to be due to a combination of prevailing environmental conditions, fishing effort, and the effects of changes in the economics of the fishery.

DESCRIPTION OF THE FISHERY

Current Regulations

The MFC has established several rules that directly govern the harvest of shrimp and the use of trawls. Below are rules and excerpts from rules that directly apply to the shrimp fishery. The rules below do not cover all gear, area, or other rules which may impact the shrimp fishery. As state and federal regulations may change, please contact the North Carolina Division of Marine Fisheries (DMF) for the most current regulations.

Shrimp cannot be taken by nets until the division Director opens the season by proclamation (NCMFC Rule 15A NCAC 03L .0101). The Director has the proclamation authority to specify hours of day or night or both and any other conditions appropriate to manage the fishery. Areas open to trawling are also considered open areas for shrimp harvest for all other gears including cast nets. Proclamations identifying areas open and closed to the harvest of shrimp can be found at: https://deq.nc.gov/fisheries-management-proclamations#currentprocs.

Area Restrictions

Shrimp and crab trawl nets cannot be used in any primary or permanent SNA; however, the DMF Director can open SSNAs to trawling by proclamation from August 16 through May 14 (NCMFC Rule 15A NCAC 03N .0104 and .0105). With the adoption of Amendment 2, a static season was established to open all SSNAs, at the Director's discretion, no earlier than September 1. In the Albemarle Sound and its tributaries, the use of shrimp trawls is prohibited (NCMFC Rule 15A NCAC 03J .0104). Additional trawl net prohibited areas are established in parts of Pamlico, Core, and Back sounds (NCMFC Rule 15A NCAC 03J .0104 and 03R .0106). Shrimp trawling is prohibited in military danger zones and restricted areas throughout all internal coastal waters (NCMFC Rule 15A NCAC 03R .0102).

With the adoption of Amendment 2, trawling at all coastal inlets in Crab Spawning Sanctuaries was prohibited year around (SH-1-2024 and SH-2-2024). In designated pot areas, the use of trawls is prohibited from June 1 to November 30 (NCMFC Rule 15A NCAC 03J .0104(b)(6), 03J .0301(a)(2), 03R .0107 and Proclamation SH-1-2024) and within the shoreline to the depth of six feet [NCMFC Rule 15A NCAC 03J .0104(6)]. Trawling is prohibited in oyster seed management areas (NCMFC Rule 15A NCAC 03K .0208 and 03R .0116) and oyster sanctuaries (NCMFC Rule 15A NCAC 03K .0209 and 15A NCAC 03R .0117). In the Pamlico, Pungo, and Neuse rivers as well as portions of New Hanover and Brunswick counties, shrimp trawl prohibited areas were implemented as part of the 2006 Shrimp FMP and Amendment 1 to protect habitat, reduce bycatch, reduce use conflict, and protect small shrimp (NCMFC Rule 15A NCAC 03L .0103(e) and 03R .0114). With the adoption of Amendment 2, shrimp trawling in Bogue Sound and

the Carolina Beach Boat Basin was prohibited, except within the Intracoastal Waterway (Proclamations SH-1-2024 and SH-2-2024).

In the Atlantic Ocean, the use of commercial gear is prohibited within 750 feet of licensed fishing piers [NCMFC Rule 15A NCAC 03J .0402(a)(1)(ii)]. Commercial fishing gears are also restricted within 750 feet from piers at specified times of the year in Onslow, Pender, New Hanover counties [NCMFC Rule 15A NCAC 03J .0402(a)(2)(A)(B)(i)(ii)(iii)]. All trawls are restricted from use within one-half mile of the beach between the Virginia line and Oregon Inlet in the Atlantic Ocean (NCMFC Rule NCAC 03J .0202(2). Additional area restrictions have been implemented in the Southport Boat Harbor, Brunswick County and at the Progress Energy intake canal at the Brunswick County Nuclear Power Plant for public safety (NCMFC Rule 15A NCAC 03J .0206 and .0207).

Gear Restrictions

The use of otter trawls upstream of Highway 172 Bridge in the New River was prohibited as part of the 2006 Shrimp FMP, limiting trawling to skimmer trawls [NCMFC Rule 15A NCAC 03J .0208(a)]. The 2006 FMP also established a maximum combined headrope limit of 90 feet in internal coastal waters of North Carolina, except in the Pamlico Sound and mouths of the Pamlico and Neuse rivers where up to 220 feet of combined headrope may be used [NCMFC Rule 15A NCAC 03L .0103(c)(d)]. The 220 feet maximum headrope limit was implemented in Pamlico Sound to cap fleet capacity as part of Amendment 1 [NCMFC Rule 15A NCAC 03L .0103(d)(1) (2)(3)]. Recreational fishermen possessing a Recreational Commercial Gear License (RCGL) are limited to one shrimp trawl with a maximum headrope length of 26 feet [NCMFC Rule 15A NCAC 03O .0302(2)].

Minimum mesh size requirements for shrimp trawls (otter and skimmer) are one and one-half inches (NCMFC Rule 15A NCAC 03L. 0103L). However, in the Pamlico Sound and portions of the Pamlico and Neuse rivers where up to 220 feet of headrope is allowed as well as the Atlantic Ocean the minimum tail bag mesh size is one and three-quarter inches (Proclamations SH-1-2022 and SH-3-2022). Net material used as chafing gear must be four inches mesh length, except smaller mesh may be used along the bottom half of the tailbag (NCMFC Rule 15A NCAC 03L .0103). The minimum mesh size for channel nets, float nets, butterfly nets, and hand seines is one and one-quarter inches [NCMFC Rule 15A NCAC 03L. 0103L(a)(2)]. The minimum mesh size for shrimp pots is one and one-fourth inches stretch or five-eighths inch bar [NCMFC Rule 15A NCAC 03J .0301(e)].

Bycatch reduction devices are required in all trawls used to harvest shrimp [NCMFC Rule 15A NCAC 03J .0104(d)]. Proclamation SH-1-2022 describes the BRD requirements for otter trawls in Pamlico Sound and the Pamlico, Bay, and Neuse rivers where up to 220 feet of combined headrope is allowed. Otter and skimmer trawls in all other waters statewide are required to have two BRDs installed on each net (Proclamation SH-2-2022). Primary and secondary BRD requirements for the Croatan and Roanoke sounds, portions of the Pamlico, Bay, and Neuse rivers, and Core Sound south to the SC-NC state line are listed in Proclamation SH-2-2022. Proclamation SH-3-2022 describes the BRD requirements for otter trawls in the Atlantic Ocean.

All shrimp trawls must conform with the federal requirements for Turtle Excluder Devices (TEDs) [NCMFC Rule 15A NCAC 03L .0103(h)]. All otter trawl nets are required to have a federally approved TED with bar spacing up to four inches if using mechanical retrieval methods. Federally approved TEDs are listed in United States Code of Federal Regulations Title 50, Section 223.207. Effective August 1, 2021, all skimmer trawls 40 feet and greater must have a federally approved TED installed with a bar spacing no greater than three inches in each net. Skimmer trawls less than 40 feet will not be required to use TEDs but must limit tow times to 55 minutes from April 1 through October 31, and 75 minutes from November 1 through March 31 [50 CFR 223.206 (d)(2)(ii)(A)].

Channel nets or other fixed or stationary nets in the IWW are prohibited from blocking more than two-thirds of any natural or manmade waterway, in the middle third of any marked navigation channel [NCMFC

Rule 15A NCAC 03J .0101(1)(2)(3)]. Channel nets cannot be set with any portion of the set within 50 feet of the center line of the IWW channel or in the middle third of any navigation channel marked by the Corps of Engineers or the Coast Guard. Channel nets must be always attended [NCMFC Rule 15A NCAC 03J .0106(a)(3)(4)(5)] and not exceed 40 yards in length. No channel net, net buoys or stakes can be left in coastal waters from December 1 through March 1. From March 2 through November 30, cables and any attached buoy must be connected with a non-metal line when not attached to the net; metallic floats or buoys to mark sets are prohibited [NCMFC Rule 15A NCAC 03J .0106(b)(c)(d)(e)].

The leads or any fixed or stationary net or device to direct shrimp into shrimp pots is prohibited [NCMFC Rule 15A NCAC 03J .0301(l)]. Recreational fishermen holding a RCGL may use up to five shrimp pots [NCMFC Rule 15A NCAC 03O .0302(a)(3)]. Recreational pots must be marked with a hot pink buoy and owner's identifying information [NCMFC Rule 15A NCAC 03J .0302(a)]. The use of more than one shrimp pot attached to the shore along privately owned land or to a privately owned pier is prohibited without possessing a valid RCGL [NCMFC Rule 15A NCAC 03J .0302(b)]. A pound net permit is required to deploy a shrimp pound and the set must be operational for a minimum of 30 consecutive days during the permit period [NCMFC Rule 15A NCAC 03J .0501(b)(1)(2)]. Shrimp pounds are defined as pound net set with all pounds (holding pen) constructed of stretch mesh equal to or greater than one and one-fourth inches and less than or equal to two inches [15A NCAC 03J .0501(6)]. RCGL holders may use one pound net with leads up to 10 feet in length with an enclosure up to 36 inches; attendance is required at all times and all gear must be removed from the water when not being fished [NCMFC Rule 15A NCAC 03O .0302(8)]. Shrimp pound sets must be properly marked with the permittee's identification and Pound Net Set Permit number, marked with a yellow light reflective tape or yellow light reflective devices on each pound, and have a marked navigational opening at least 25 feet wide at the end of every third pound [NCMFC Rule 15A NCAC 03J .0501(b)(c)]. Shrimp pound net sets must be set a minimum of 100 yards from a RCGL shrimp pound net set or 300 yards from an operational permitted shrimp pound net set [NCMFC Rule 15A NCAC 03J .0501(d)(2)].

Effort Restrictions

Shrimp trawling is prohibited in internal coastal waters from 9:00 p.m. on Friday through 5:00 p.m. on Sunday [NCMFC Rule 15A NCAC 03J .0104(b)(1)]. However, weekend shrimp trawling is allowed in Atlantic Ocean, with the use of fixed and channel nets, hand, seines, shrimp pots, and cast nets, or for a holder of a Permit for Weekend Trawling for Live Shrimp [NCMFC Rule 15A NCAC 03L .0102, 03O .0503(1)(2)(3)]. In portions of the Pungo, Pamlico, Bay, Neuse, and New rivers the use of trawl nets is prohibited from one hour after sunset to one hour before sunrise prohibited from December 1 through February 28 [NCMFC Rule 15A NCAC 03J .0208]. Upstream of the Highway 172 Bridge in New River shrimp trawling (skimmer only) is prohibited from 9:00 p.m. through 5:00 a.m. when opened by proclamation from August 16 through November 30 (NCMFC Rule 15A NCAC 03J .0208(b)).

Incidental Catch

The possession of more than 500 pounds of finfish from December 1 through February 28 and 1,000 pounds of finfish from March 1 through November 30 is prohibited while using a trawl in internal waters [NCMFC Rule 15A NCAC 03J .0104(a)]. Shrimp trawls cannot be used to take blue crabs in internal waters, except when the weight of the crabs does not exceed 50% of the total weight of the combined crab and shrimp catch or 300 pounds, whichever is greater [NCMFC Rule 15A NCAC 03J .0104(f)(2)]. From December 1 through March 31, it shall be unlawful to possess finfish caught incidental to shrimp and crab trawling in the Atlantic Ocean unless the weight of the combined catch of shrimp and crabs exceeds the weight of finfish; except that crab trawlers working south of Bogue Inlet may keep up to 300 pounds of kingfish, regardless of their shrimp or crab catch weight [NCMFC Rule 15A NCAC 03J .0202(5)]. Channel nets are prohibited from to taking blue crabs in internal waters, except when the weight of the crabs does not exceed 50% of the total weight of crab and shrimp or 300 pounds, whichever is greater [NCMFC Rule 15A NCAC 03J .0106(h)(1)(A)(B)].

Recreational Creel Limits

Recreational fishermen using cast nets are limited to no more than 48 quarts (heads on) or 30 quarts (heads off) of shrimp per person per day or per vessel per day if a vessel is used in all Coastal Fishing Waters (Proclamation SH-4-2022). Recreational fishermen using limited amounts of commercial gear authorized under the Recreational Commercial Gear License (NCMFC Rule 15A NCAC 03O .0302) are limited to 48 quarts (heads on) or 30 quarts (heads off) of shrimp per person per day or if vessel is used, per vessel per day. If more than one RCGL holder are on a vessel, a maximum of two limits per vessel are allowed in areas open to shrimping [NCMFC Rule 15A NCAC 03O .0303(e)(f) and Proclamations SH-1-2024 and SH-2-2024].

Commercial Fishery

Landings in the North Carolina shrimp fishery vary from year to year and are dependent primarily on environmental conditions. Environmental factors, especially severity of winter temperatures, and salinity can have a major influence on the yearly harvest. North Carolina's shrimp fishery is unusual in the southeast because all three species are taken here and most of the effort occurs in internal waters. While South Carolina, Georgia, and Florida allow limited inside waters shrimping, much of their fisheries are conducted in the Atlantic Ocean and white shrimp comprise most of their harvest (NCDMF 2015).

Commercial activity occurs in all waters. The shrimp fishery in the northern portion of the state is conducted in Pamlico, Croatan, and Roanoke sounds and Pamlico, Pungo, Bay, and Neuse rivers. The otter trawl is the predominant gear used in this portion of the state. The shrimp fishery in the central coastal area of the state occurs in Core and Bogue sounds, and the North, Newport, and White Oak rivers. In the southern portion of the state, the fishery is characterized by a large number of small boats fishing internal waters (primarily the IWW, New and Cape Fear rivers) and larger vessels fishing the Atlantic Ocean primarily off New River, Carolina Beach, and Brunswick County. Many of the small boats are fished by individuals who shrimp part-time or for personal consumption.

A variety of methods are used to catch shrimp including otter trawls, skimmer trawls, channel nets, shrimp pounds, and cast nets. Otter trawls derived their name from the two trawl doors (otter doors/boards) that attach to the bridle that are hydro-dynamically designed to hold the wings of the net open. As the net is pulled along the bottom, the otter boards plane in opposite directions holding the net open. Otter trawls are used for all three species in both the estuary and the ocean. Two-seam trawls are used for brown and pink shrimp and four-seam and tongue trawls for white shrimp, which tend to swim higher in the water column and will jump to the surface when disturbed. Skimmer trawls consist of two rigid frames attached to each side of a vessel with nets attached along the two sides of the frame. Metal skids keep the frames off the bottom as the nets are pushed through the water column. Unlike otter trawls, the tailbags of skimmer trawls can be checked while fishing. Skimmer trawls are primarily used for white shrimp and are capable of fishing waters as shallow as two feet.

Use of gears other than trawls has increased primarily in the area from New River to Rich's Inlet. Channel nets are stationary nets that use tidal currents to fish the surface and middle depths of the water column. The mouth of the nets is held open by upright wooden shafts attached to a buoy and anchor on one side and a small vessel on the other. Float and butterfly nets also make use of tidal currents to push shrimp into the nets and offer the advantages of less fuel consumption and less bycatch than traditional shrimp trawls. To shrimp with a “float net”, fishermen attach large floats to the doors and top lines of trawls to make the net fish up in the water column and are pulled slowly forward to harvest shrimp that are migrating to the inlets at night. Butterfly nets use this same harvest strategy but are attached to a metal frame and are held stationary in the water column to capture shrimp as the current carries them into the net. Trawls, cast nets, and seines are used to harvest live shrimp for the commercial bait fishery.

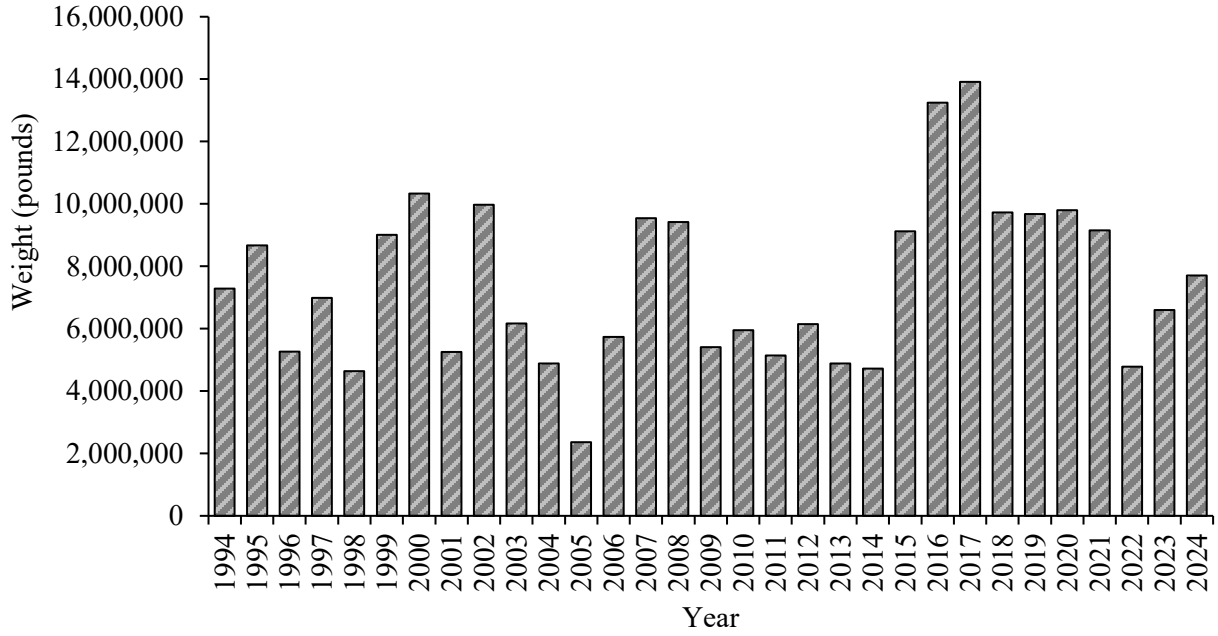

Figure 1. Annual commercial shrimp landings (pounds) from all three shrimp species combined in North Carolina, 1994–2024. Data from the DMF Trip Ticket Program.

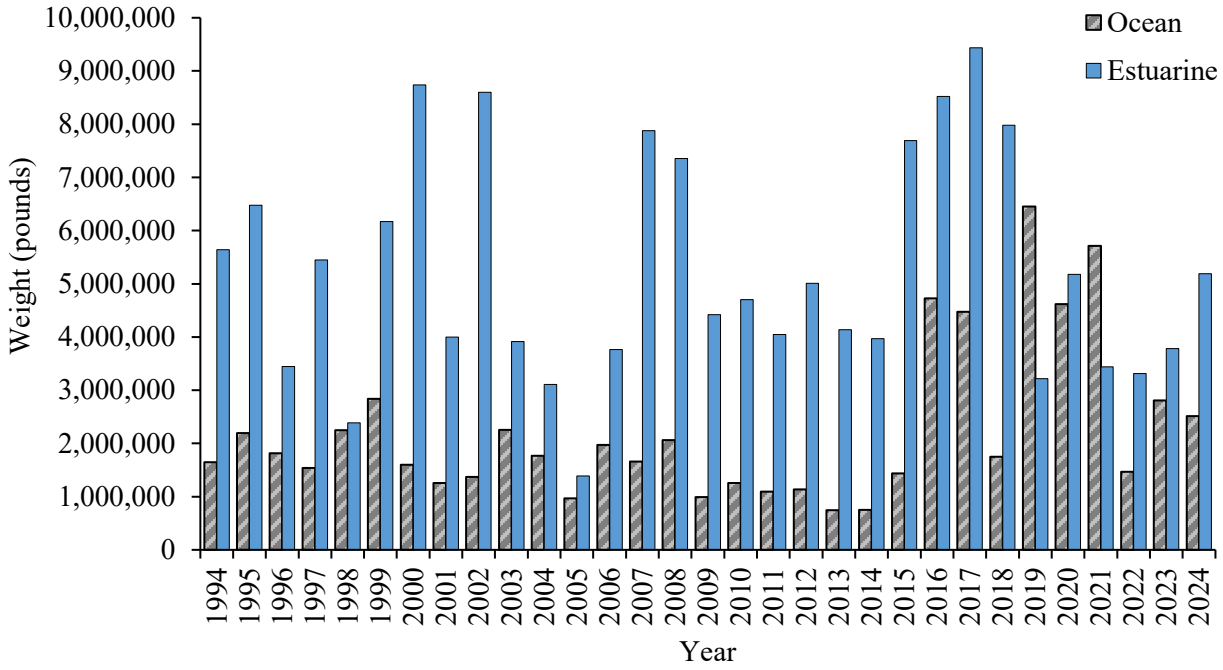

Figure 2. Annual commercial shrimp landings (pounds) by area from all three shrimp species combined in North Carolina, 1994–2024. Data from the DMF Trip Ticket Program.

Landings provided by the trip ticket program are combined for the three shrimp species (Figure 1). Total landings from 1994 to 2024 averaged 7,466,298 pounds per year. In 2024, 7,704,214 pounds of shrimp were landed. Total landings increased 17% from 2023 to 2024. In 2024, 67% of the harvest occurred in estuarine waters, with the remainder occurring in the Atlantic Ocean (less than 3 miles from shore).

Landings in estuarine waters increased 37% and landings in the Atlantic Ocean (less than 3 miles from shore) decreased 11% from 2023 to 2024 (Figure 2).

Annual shrimping effort (number of trips) has fluctuated with shrimp abundance but appears to have declined since 1994 (NCDMF 2015, 2022). This may be due to a number of factors including cheaper imported shrimp prices, increasing fuel prices, and fishermen retiring. Landings in 2005 were lowest on record, likely from several reasons; many large trawlers remained scalloping instead of shrimping because prices were high and the days at sea were extended (NCDMF 2015). Hurricanes Katrina (8/29/05) and Rita (9/4/05) hit the Gulf Coast, negatively affecting the fishing industry. Shrimp breading operations in the Gulf shut down with only one operational in September 2005 and some North Carolina shrimpers could not sell their product (NCDMF 2015). Hurricane Florence (9/17/18) directly hit North Carolina, likely contributing to the decrease in landings in 2018. The number of trips increased 4% from 2023 to 2024 (Figure 3). Poor ex-vessel prices, cheap imported shrimp, and high fuel prices are presumed to have contributed to the decline in effort in recent years.

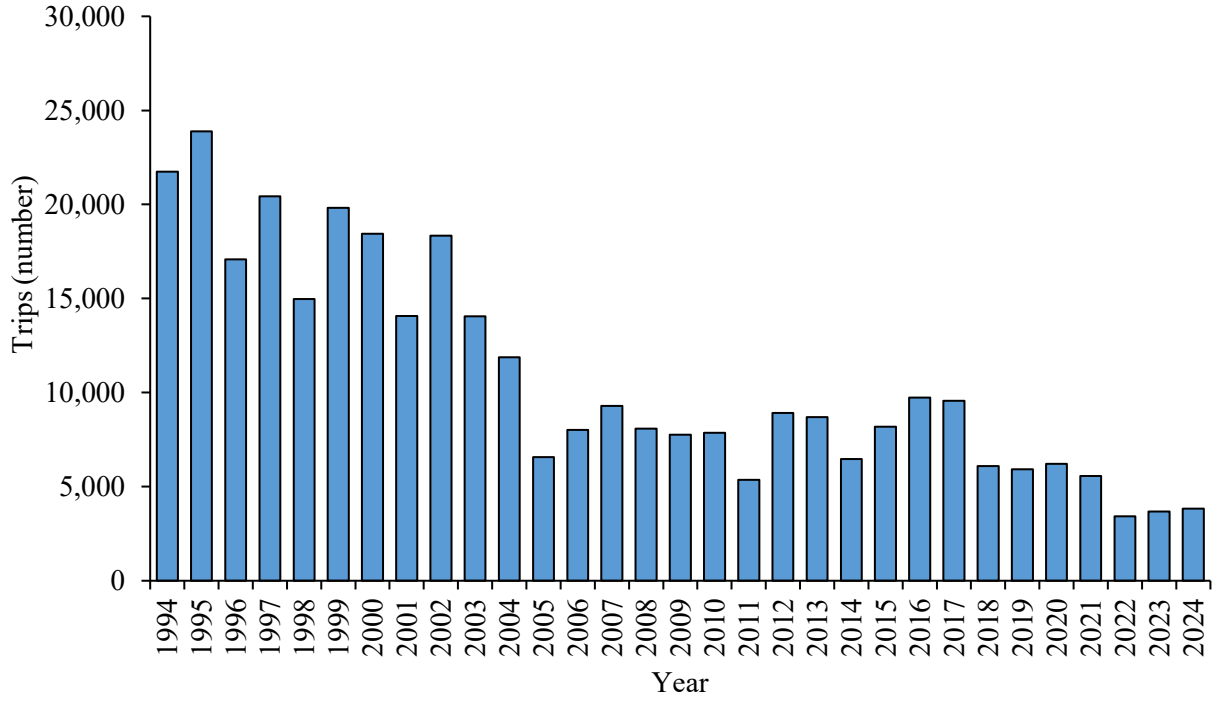

Figure 3. Annual number of commercial trips reported for all three species combined in inside and ocean waters, 1994–2024. Data from the DMF Trip Ticket Program.

Recreational Fishery

Shrimp are harvested recreationally throughout the state by otter trawls, skimmer trawls, seines, cast nets, shrimp pots and shrimp pounds with specific gear limitations. The NC Coastal Angling Program uses multiple surveys to obtain recreational harvest and landings data; however, the recreational harvest of shrimp is limited to the Cast Net and Seine Mail Survey and the RCGL Survey.

Anyone harvesting shrimp recreationally with commercial gear are required to purchase a Recreational Commercial Gear License (RCGL). The RCGL is an annual license that allows recreational fishermen to use limited amounts of commercial gear to harvest seafood for personal consumption. Seafood harvested under this license cannot be sold. Fishermen using this license are held to recreational size and possession limits, gear marking and gear limit and configuration requirements. Recreational landings of shrimp from RCGL gears are currently unknown since there is no directed survey for this gear.

In October of 2011, DMF began surveying Coastal Recreational Fishing License (CRFL) holders to determine if they used cast nets or seines. This mail survey was implemented to develop catch and effort estimates for recreational harvest with these specific gear types, including recreational shrimp harvest. Catch refers to the number of shrimp harvested by each angler and effort is the number of trips taken by the angler. This data is then extrapolated to represent the population of CRFL holders and presented as catch and effort estimates. The estimated annual average number of shrimp caught (harvest and released) using a cast net and/or seine was 158,441 shrimp from 2012 to 2022 (Figure 4). In 2023, a new licensing system was implemented, and the license database was restructured. This restructuring disrupted our ability to query the full license dataset to establish a sampling frame of eligible anglers for the mail surveys. As a result, DMF was unable to administer the mail surveys and expand potential responses and survey estimates are not available for 2023 and 2024. The mail surveys were reinstated in January 2025.

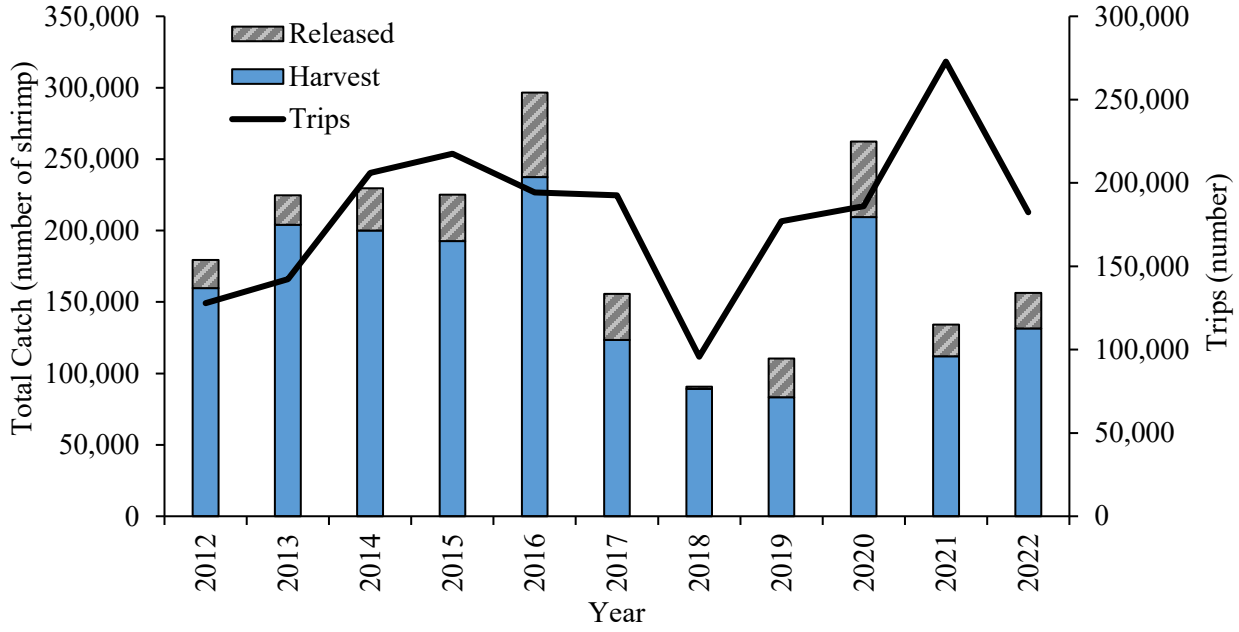

Figure 4. Annual number of trips and shrimp taken from cast nets and seines for recreational purposes, 2012–2022. In 2023, a new licensing system was implemented, and the license database was restructured. This restructuring disrupted our ability to query the full license dataset to establish a sampling frame of eligible anglers for the mail surveys. As a result, we were unable to administer the mail surveys and expand potential responses and survey estimates are not available for the last few years.

MONITORING PROGRAM DATA

Fishery-Dependent Monitoring

Currently, the only data available for the stock in all areas are the commercial landings and associated effort from the N.C. Trip Ticket Program. No fishery dependent monitoring program exists for shrimp.

Fishery-Independent Monitoring

The Estuarine Trawl Survey (Program 120) is a fishery-independent multispecies monitoring program that has been ongoing since 1971 in the months of May and June. One of the key objectives of this program is to provide a long-term database of annual juvenile recruitment for economically important species. This survey samples fixed stations, a set of 104 core stations with additional stations as needed. The core stations are sampled from western Albemarle Sound south through the South Carolina border each year without deviation two times in the months of May and June. This survey targets juvenile finfish, blue crabs, and

penaeid shrimp. A two-seam 10.5 feet headrope trawl with a 1/4-inch mesh in the body and 1/8-inch mesh in the tailbag is used. A one-minute tow is conducted covering 75 yards. All species taken are sorted, identified, and a total number is recorded for each species. For target species, a subset of at least 30 to 60 individuals is measured. Environmental data are collected, including salinity, dissolved oxygen, temperature, wind speed, and direction. During 2020, sampling was impacted due to the COVID pandemic. Executive Order (EO) 116, issued on March 10, 2020, declared North Carolina under a State of Emergency and was soon followed by EO 120 which implemented a statewide Stay at Home Order for all non-essential State employees. During this time, sampling did not occur in May, but did occur in early and late-June. In 2021, sampling resumed in the months of May and June.

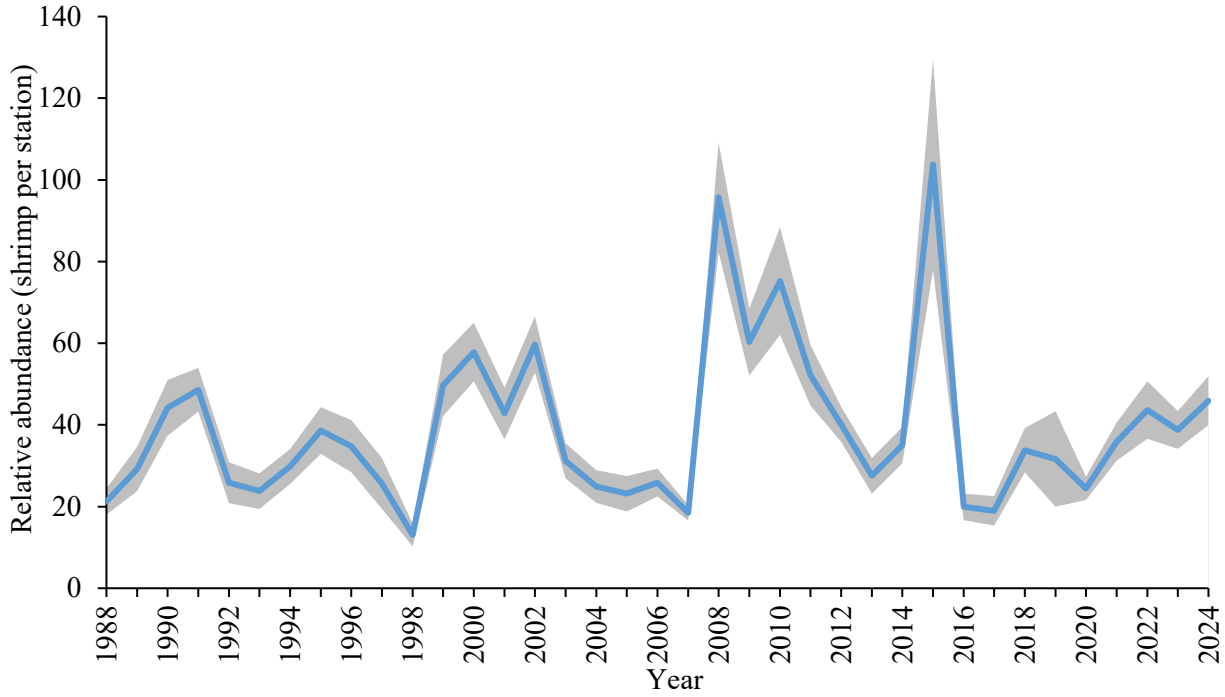

Figure 5. Annual index of relative abundance (shrimp per station) of brown shrimp from Program 120 estuarine trawl survey, 1988–2024. Shaded area represents standard error.

Annual trends in brown shrimp relative abundance, measured as the number of brown shrimp per station in Program 120 sampling, show fluctuations from year to year (Figure 5). In 2024, the relative index of abundance was 45.9 and increased 18% from 2023 to 2024 (Figure 5). The proportional standard error was below 20 in all but four years from 1988 to 2024. As indicated in the stock status section, annual landings are a good indication of relative abundance of shrimp in the coastal fishing waters of North Carolina. Estimates of recruitment calculated from the annual brown shrimp index of relative abundance can also be used to determine year class strength. Trends in overall shrimp landings from June and July, months that brown shrimp make up most of the harvest, show similar trends as the Program 120 data (Figure 6). Currently, there are no juvenile indices of abundance for white and pink shrimp in North Carolina.

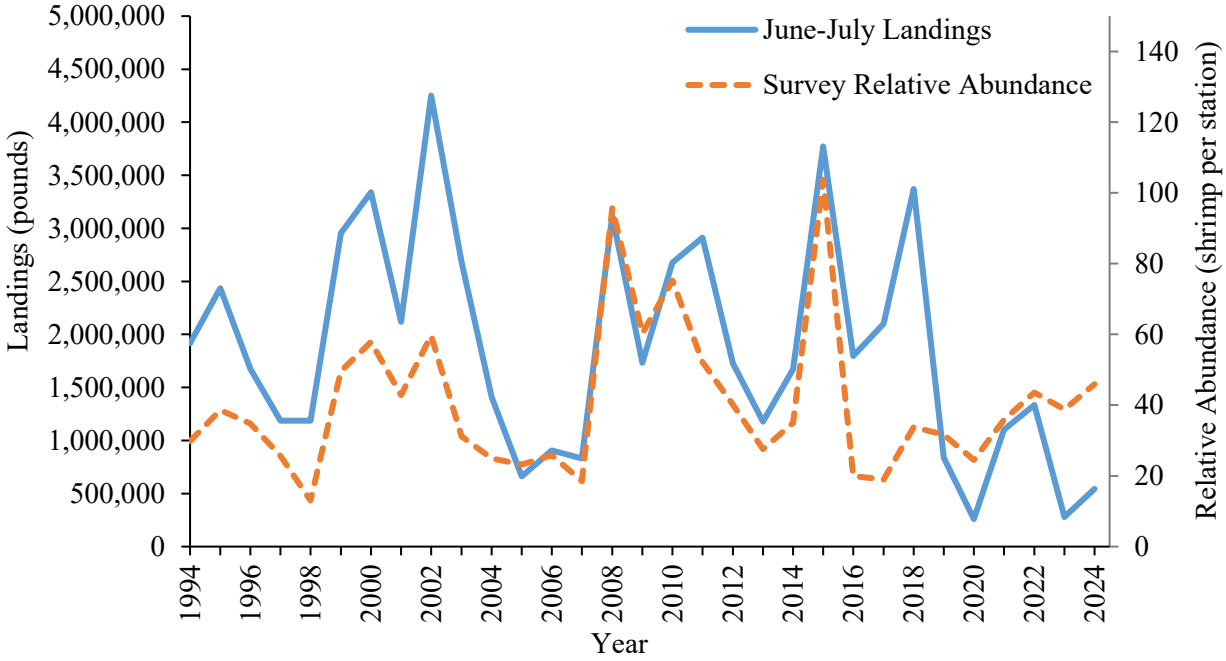

Figure 6. Comparison of brown shrimp commercial shrimp landings (pounds) in the months of June and July to the brown shrimp Program 120 index of relative abundance (shrimp per station), 1994–2024.

RESEARCH NEEDS

The following research needs are from Amendment 2 to the N.C. Shrimp FMP (NCDMF 2022). The list below outlines the specific needs and highlights the prirority and status of each.

High

- Create a long-term shrimp trawl observer program to characterize bycatch across all strata (for example: dominant species, protected species, season, areas, gear type, vessel type, number of nets/rigs, headrope length, TED position, etc.). — Needed
- Improve accuracy of self-reported license gear survey data or investigate other means of accurately obtaining shrimp fleet characteristics. — Needed
- Collect improved effort data (e.g., headrope length, number of nets, tow time, number of tows) to provide bycatch estimates based on actual time fished (or number of tows), rather than number of trips. — Needed
- Create and validate juvenile abundance indices for white and pink shrimp. — Needed
- Determine the cumulative impacts of shrimp trawl bycatch on individual species population dynamics and the ecosystem. — Needed
- Determine the spatial, temporal, and biological characteristics of submerged aquatic vegetation that maximize their ecological value to shrimp for restoration and conservation purposes. — Needed
- Determine how the resuspension of sediment, siltation, and non-point source pollution from adjacent land use practices impacts trends in shrimp abundance and habitat degradation.
- Develop alternative non-bottom disturbing gears to efficiently catch shrimp. — Needed

Medium

- Determine the influence of current bottom disturbing gears patterns (location, frequency, etc.) on sub-tidal shell, and SAV in Pamlico Sound. — Needed
- Continue to locate, map, and quantify the bottom habitat structure, bathymetry, and sediment types in North Carolina estuaries. — Ongoing
- Measure the effects of trawling on sediment size distribution and organic carbon content.
- Establish continuous water quality monitoring in the Pamlico system to evaluate water quality effects on shrimp and the fish habitats in which they rely. — Needed
- Develop research methods to understand costs and benefits of maintaining shrimp habitat and water quality to inform decision-making on shrimp management. — Needed

Low

- Initiate research to determine the impacts of endocrine disrupting chemicals (EDCs) on the various life stages of shrimp. — Needed
- Expand current social and economic surveys to specifically collect information on shrimp fishermen. — Needed

MANAGEMENT

There are no management triggers or methods to track stock abundance, fishing mortality, or recruitment between benchmark reviews from the current FMP. Several management issues were explored in Amendment 2; Table 1 outlines the specific issues and the implementation status of each strategy.

FISHERY MANAGEMENT PLAN SCHEDULE RECOMMENDATIONS

The division recommends maintaining the next scheduled review of this plan in July 2027.

LITERATURE CITED

Batchelder, L. J., J. P. Stone, M, M. E. Kimball, B. W. Pfirrmann, and R. P. Dunn. 2024. Phenology of penaeid shrimp nursery habitat use: trends and environmental drivers over four decades. Marine Ecology Progress Series. 751. 10.3354/meps14741.

Brown, K. B. 2009. Characterization of the near-shore commercial shrimp trawl fishery from Carteret County to Brunswick County, North Carolina Completion report for NOAA award no. NA05NMF4741003 North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries, 29 p.

Brown, K. B. 2010. Characterization of the inshore commercial shrimp trawl fishery in Pamlico Sound and its tributaries, North Carolina. Completion report for NOAA award no. NA05NMF4741003 North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries, 28 p.

Brown, K. B. 2015. Characterization of the commercial shrimp otter trawl fishery in the estuarine and ocean (0-3 miles) waters of North Carolina. Completion report for NOAA award no. NA08NMF4740476 and NA13NMF4740243. North Carolina Department of Environmental Quality, Division of Marine Fisheries, 177 p.

Brown, K. B. 2016. Pilot Study: Characterization of bycatch and discards, including protected species interactions, in the commercial skimmer trawl fishery in North Carolina. Completion report for NOAA award no. NA14NMF47400363 and NA13NMF4740243 North Carolina Department of Environmental Quality, Division of Marine Fisheries, 36 p.

Brown, K. B. 2017. Characterization of the commercial shrimp fishery in the estuarine and ocean (0-3 miles) waters of North Carolina. Completion report for NOAA award no. 241.NA13NMF4740243. North Carolina Department of Environmental Quality, Division of Marine Fisheries, 87 p.

Brown, K. B. 2018. Characterization of the commercial shrimp fishery in the estuarine and ocean (0-3 miles) waters of North Carolina. Completion report for NOAA award no. NA13NMF4740243. North Carolina Department of Environmental Quality, Division of Marine Fisheries, 44 p.

Brown, K.B., B. Price, L. Lee, S. Baker, and S. Mirabilio. 2017. An evaluation of bycatch reduction technologies in the North Carolina shrimp trawl fishery. North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries, Morehead City, NC. 40 pp.

Brown, K.B., B. Price, L. Lee, S. Baker, and S. Mirabilio. 2018. Technical solutions to reduce bycatch in the North Carolina Shrimp Trawl Industry. North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries, Morehead City, NC. 50 pp.

Eldred, B., R.M. Ingle, K.D. Woodburn, R.F. Hutton, and H. Jones. 1961. Biological observations on the commercial shrimp, Penaeus duorarum Burkenroad, in Florida Waters. Fla. Board Conserv. Mar. Lab. Prof Pap. Ser. 3. 139 pp.

Gunter, G. 1961. Habitat of juvenile shrimp (Family Penaeidae). Ecology 42:598-600.

MacArthur, R.H. and E.O. Wilson. 1967. The theory of island biogeography. Princeton University Press, Princeton, New Jersey, USA. 215 pp,

McCoy, E.G. 1968. Movement, growth and mortality of brown shrimp (Penaeus aztecus) marked and released in Swanquarter Bay, Pamlico Sound North Carolina. North Carolina Department of Conservation and Development, Division of Commercial and Sports Fisheries, Special Scientific Report No. 15, 26 p.

McCoy, E.G. 1972. Dynamics of North Carolina Commercial Shrimp Populations. North Carolina Department of Natural and Economic Resources, Division of Commercial and Sports Fisheries, Special Scientific Report No. 21, 53p.

McCoy, E.G. and J.T. Brown. 1967. Migration and Growth of Commercial Penaeid Shrimps in North Carolina. Ann. Rep., Spec. Sci. Rep. 11, North Carolina Department of Conservation and Development, Division of Commercial and Sports Fisheries, 29 p.

Morley J.W, N. Heck, L.S. Schlenker, and S. Farquhar. 2022. The Influence of Environmental Factors and Changes to Hydrology on Brown Shrimp Recruitment. North Carolina Sea Grant, Project # R/NCSG-RM-02. 29 p.

NCDMF (North Carolina Division of Marine Fisheries). 2006. North Carolina Shrimp Fishery Management Plan. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 384 pp.

NCDMF. 2015. North Carolina Shrimp Fishery Management Plan, Amendment 1. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 519 pp.

NCDMF. 2018. May 2018 Revision to Amendment 1 to the North Carolina Shrimp Fishery Management Plan. North Carolina Department of Environmental Quality. North Carolina Division of Marine Fisheries. Morehead City, NC. 64 pp.

NCDMF. 2021. May 2021 Revision to Amendment 1 to the North Carolina Shrimp Fishery Management Plan. North Carolina Department of Environmental Quality. North Carolina Division of Marine Fisheries. Morehead City, NC. 28 pp.

NCDMF. 2022. North Carolina Shrimp Fishery Management Plan, Amendment 2. North Carolina Department of Environmental Quality. North Carolina Division of Marine Fisheries, Morehead City, North Carolina. 323 p.

NCDMF. 2024. May 2024 Revision to Amendment 2 to the North Carolina Shrimp Fishery Management Plan. North Carolina Department of Environmental Quality. North Carolina Division of Marine Fisheries. Morehead City, NC. 30 pp.

Perez-Farfante, I. 1969. Western Atlantic shrimps of the genus Penaeus. U.S. Fish Wildl. Serv. Fish. Bull. 67(3): 461-591.

Purvis, C.E., and E.G. McCoy. 1972. Overwintering Pink Shrimp (Penaeus duorarum) in Core and Pamlico Sounds, N.C. North Carolina Department of Natural and Economic Resources, Division of Commercial and Sports Fisheries, Special Scientific Report No. 21, 53 p.

Schlenker, L.S., C. Stewart, J. Rock, N. Heck, J.W. Morley. Environmental and climate variability drive population size of annual penaeid shrimp in a large lagoonal estuary. PLoS ONE 18(5): e0285498. https://doi.org/10.1371/journal.pone.0285498

Whitaker, J.D. 1981. Biology of the species and habitat descriptions. Pages 5.1-6.12 in M.D. McKenzie, ed. Profile of the penaeid shrimp fishery in the south Atlantic. South Atlantic Manag. Council, Charleston, S.C.

Whitaker, J.D. 1982. White shrimp tagging experiment in South Carolina. Proj. Rept. S.C. Mar. Resour. Center. 6 pp.

Whitaker, J.D. 1983. Roe shrimp tagging 1983. Project Rep. S.C. Wildl. Mar. Res. Dep., Charleston, S.C. 4 pp.

Williams, A.B. 1984. Shrimps, lobsters, and crabs of the Atlantic coast of the eastern United States, Maine to Florida. Smithsonian Institution Press. Washington, D.C. 550 pp.