

**FISHERY MANAGEMENT PLAN UPDATE
ATLANTIC CROAKER
AUGUST 2026**

STATUS OF THE FISHERY MANAGEMENT PLAN

Fishery Management Plan History

FMP Documentation:	ASMFC FMP	October 1987
	Amendment 1	November 2005
	Addendum I	March 2011
	Addendum II	March 2014
	Addendum III	February 2020

Comprehensive Review: In Progress

The original Fishery Management Plan (FMP) for Atlantic Croaker was adopted in 1987 by the Atlantic States Marine Fisheries Commission and included states from Maryland through Florida (ASMFC 1987). Upon review of the FMP, the South Atlantic State/Federal Fisheries Management Board (here after referred to as the Board) determined the management recommendations were vague and that an amendment was needed to better define the management measures necessary to achieve the FMP goals. The Interstate Fisheries Management Program Policy Board adopted the finding that the original FMP did not contain any management measures that states were required to implement (ASMFC 2014).

In 2002, the Board directed the Atlantic Croaker Technical Committee to conduct the first coast wide stock assessment in preparation for an amendment. The stock assessment was developed in 2003 and approved by a Southeast Data Assessment Review panel for management use in June 2004. Amendment 1 was approved in November 2005 and fully implemented by January 1, 2006 (ASMFC 2005).

Amendment 1 expanded the original management area to include the states of Delaware and New Jersey and defined two management regions: the mid-Atlantic region which included states from New Jersey through North Carolina and the south-Atlantic region, which included states from South Carolina through the east coast of Florida (ASMFC 2005).

Amendment 1 established biological reference points to define the overfished and overfishing stock statuses for the mid-Atlantic region only. Amendment 1 did not require specific measures to restrict recreational or commercial harvest, though states with more conservative measures in place were encouraged to maintain those regulations. Amendment 1 also specified that, through adaptive management, the Board may revise Amendment 1. Regulatory and/or monitoring requirements could be included in the resulting addendum along with procedures for determining de minimis status and implementing alternative management programs via conservation equivalency.

Amendment 1 specified triggers for assessment of the stock in non-assessment years. However, if the technical committee felt there was sufficient evidence of changes in the stock, a stock assessment could be initiated in the absence of hitting the triggers. The triggers considered by the technical committee included relative percent change in landings, biological data monitoring, effort vs. landings, Marine Recreational Information Program catch per unit effort (CPUE), along with state and regional surveys.

Addendum I to Amendment 1 was initiated in August 2010 to modify the management area and biological reference points for Atlantic Croaker, based on results from the 2010 stock assessment. The assessment evaluated the Atlantic Croaker population as a single coast wide stock, whereas Amendment 1 divided the coast into two management regions. To fully utilize the stock assessment in managing the population, Addendum I consolidated the stock into one management unit and established a procedure by which the Board could approve peer-reviewed biological reference points without a full administrative process such as an amendment or addendum (ASMFC 2011).

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Addendum II to Amendment 1 was initiated in February 2014 and approved in August 2014. Addendum II established the use of the Traffic Light Approach (TLA) as a precautionary management framework (Caddy and Mahon 1995; Caddy 1998, 1999; Caddy 2002). The TLA is preferred for fast-growing, early maturing species like Atlantic Croaker because it is more important to respond to multi-year trends rather than annual changes. The TLA more effectively illustrates long term trends than the triggers established by Addendum I. The management framework utilizing the TLA replaced the management triggers stipulated in Addendum I (ASMFC 2014). The harvest component of the TLA is a composite of commercial and recreational harvest data. The population, or adult abundance, component is a composite of fishery independent survey indices (e.g., Northeast Fishery Science Center (NEFSC) and Southeast Area Monitoring and Assessment Program (SEAMAP)). If thresholds for both population characteristics meet or exceed thresholds for a 3-year period, management measures are triggered.

In February 2020, the Board approved Addendum III to Amendment 1, which revised the TLA's trigger mechanism and management response for the recreational and commercial fisheries (ASMFC 2020a). Addendum III incorporated the use of a regional approach (Mid-Atlantic NJ-VA and South Atlantic NC-FL) to better reflect localized fishery trends and changed the TLA to trigger management action if three of the four terminal years exceed threshold levels. State-specific management action is initiated when the proportion of red exceeds specified thresholds (30% or 60%) for both harvest and abundance. If management action is triggered, the coastwide response includes recreational bag limits and quantifiable measures to achieve percent reductions in commercial harvest. Response requirements vary depending on which threshold is exceeded. Addendum III also defines the mechanism by which triggered management actions may be removed, after abundance characteristics are no longer triggering management action. The TLA is reviewed annually in September. For additional information and links to the above-mentioned FMP, amendment, and addendums please refer to the ASMFC webpage for Atlantic Croaker (<http://www.asmfc.org/species/atlantic-croaker>).

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-in minimum size limit for spot and a 10-in minimum size limit for Atlantic Croaker. At its February 2017 business meeting, the North Carolina Marine Fisheries Commission passed a motion to approve 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 are not available to implement the proposed rule changes without undue detriment to the agency's existing activities and the rules were never adopted.

To ensure compliance with interstate requirements, North Carolina also manages Atlantic Croaker under the North Carolina Fishery Management Plan for Interjurisdictional Fisheries. The goal of the North Carolina FMP for Interjurisdictional Fisheries is to adopt FMPs, consistent with North Carolina Law, approved by the Mid-Atlantic Fishery Management Council (MAFMC), South Atlantic Fishery Management Council (SAFMC), or the Atlantic States Marine Fisheries Commission (ASMFC) by reference and implement corresponding fishery regulations in North Carolina to provide compliance or compatibility with approved FMPs and amendments, now and in the future. The goal of the councils and ASMFC plans, established under the Magnuson-Stevens Fishery Conservation Management Act (federal councils) and the Atlantic Coastal Fisheries Cooperative Management Act (ASMFC) are similar to the goals of the N.C Fisheries Reform Act of 1997 to "ensure long-term viability" of the fisheries (NCDMF 2015).

Management Unit

New Jersey through the east coast of Florida.

Goal and Objectives

The goal of Amendment 1 is to utilize interstate management to perpetuate the self-sustaining Atlantic Croaker resource throughout its range and generate the greatest economic and social benefits from its commercial and recreational harvest and utilization over time. The four objectives of Amendment 1 are to:

- Manage the fishing mortality rate to provide adequate spawning potential to sustain long-term abundance of the population.
- Manage the stock to maintain the spawning stock biomass above the target biomass levels and restrict fishing mortality to rates below the threshold.
- Develop a management program for restoring and maintaining essential habitat.
- Develop research priorities that will further refine the management program to maximize the biological, social, and economic benefits derived from the population.

DESCRIPTION OF THE STOCK

Biological Profile

Atlantic Croaker (*Micropogonias undulatus*) inhabit marsh, submerged aquatic vegetation, mud, and sand-bottom areas (Odell et al. 2017) from the Gulf of Maine to Argentina, but are most abundant from the Chesapeake Bay to northern Florida. However, the center of Atlantic Croaker distribution is forecast to shift northward due to climate change (Hare et al. 2010). Atlantic Croaker feed on shrimp, crabs, worms, shellfish, and small fishes (Powers et al. 2005; Nye et al. 2011). Atlantic Croaker have a protracted spawning season beginning in the early fall and extending through December with a peak during September and October (White and Chittenden 1977; Barbieri et al. 1994). Eggs and recently hatched larvae spawned in ocean waters drift toward land and the advanced larval stages and juveniles continue their migration inshore by actively swimming into estuarine nursery areas (Odell et al. 2017). Maximum recruitment (the number of fish entering the population) of juveniles is usually in the spring, with movement to offshore waters in the fall (Haven 1959; Norcross and Austin 1988). Higher overwinter survival of juvenile Atlantic Croaker has been linked to increased winter water temperatures (Hare and Able 2007; Morley et al. 2016).

Atlantic Croaker grow quickly and can reach sizes over 20 in (Ross 1988). Most Atlantic Croaker are mature by the end of their first year (White and Chittenden 1977; Barbieri et al. 1994; ASMFC 2010), with length at 50% maturity generally falling between 7- and 9-in total length (TL; Barbieri et al. 1994; ASMFC 2010; NCDMF 2021a). While it is uncommon to see Atlantic Croaker over age 10 (NCDMF 1999; Bobko et al. 2003), the oldest observed specimen, caught in the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAAP), was 17 years.

Stock Status

Currently, because there is no approved stock assessment, the stock status for Atlantic Croaker with relation to overfishing or overfished is unknown.

To evaluate the status of the stock between stock assessments, the TLA established under Addendum II and revised under Addendum III, is reviewed annually in years when an assessment is not already being conducted.

Results of the 2025 TLA (2024 terminal year) indicated harvest indices exceeded the 60% red threshold in all four terminal years (2021-2024) in the Mid-Atlantic region and exceeded the 30% red threshold in all four terminal years in the South Atlantic region (Figure 1, ASMFC 2025). This marks the tenth consecutive year the harvest metrics in both regions have exceeded the 30% threshold. However, the harvest metrics in 2024 cannot be used as a trigger mechanism because they are affected by catch restrictions triggered by previous TLAs. The Mid-Atlantic adult abundance (age 2+) composite characteristic exceeded the 30% red threshold for three of four terminal years, and 60% threshold in one of the four terminal years (2023).

However, the Mid-Atlantic abundance metric did not exceed the 30% threshold in 2024, which is the first year it has been below the 30% threshold since 2015 (ASMFC 2025). The South Atlantic abundance index did not exceed thresholds in any of the four terminal years (Figure 2, ASMFC 2025).

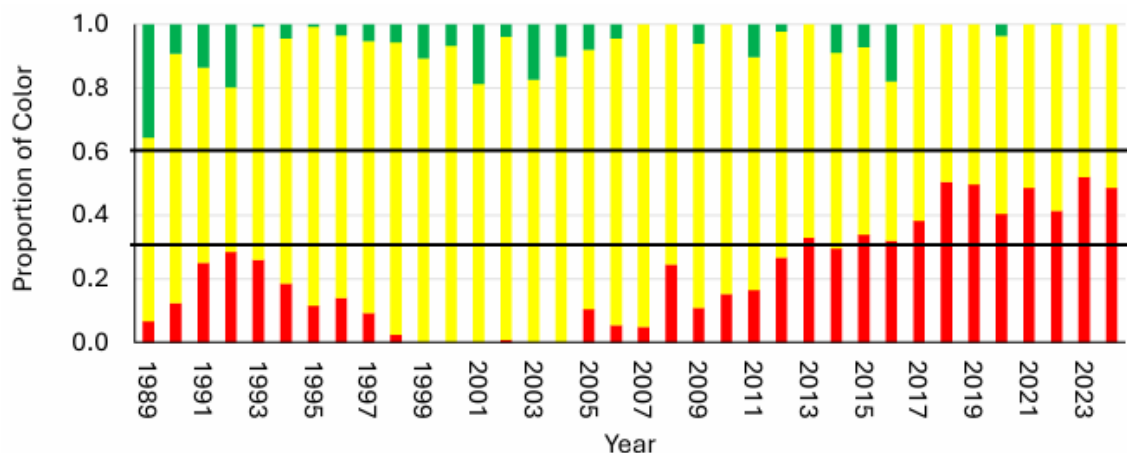


Figure 1. Annual color proportions for the harvest composite TLA of South Atlantic region (NC-FL) Atlantic Croaker recreational and commercial landings, 1989–2024 (ASMFC 2025). The reference period is 2002–2012.

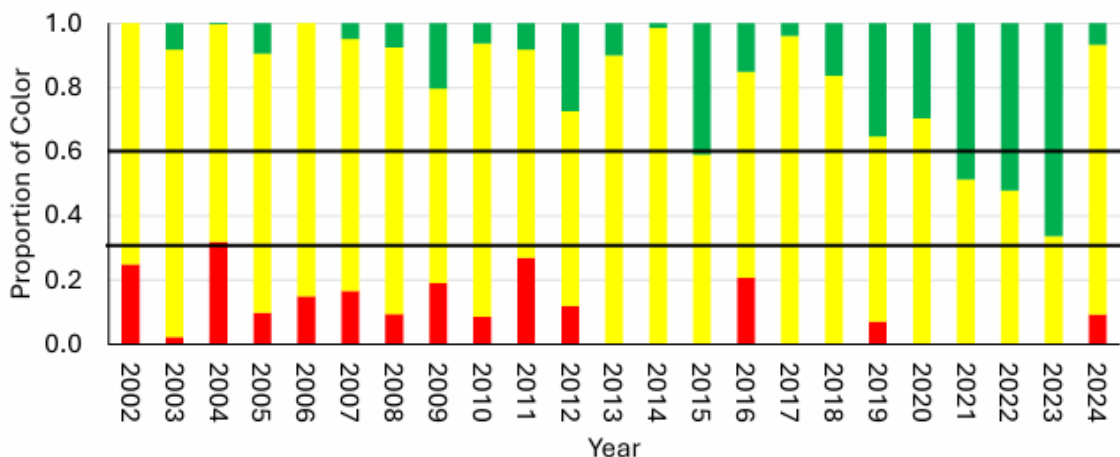


Figure 2. Annual color proportions for the abundance composite TLA of South Atlantic region (NC-FL) for adult (age 2+) Atlantic Croaker fishery independent indices (SEAMAP and SCDNR trammel survey), 2002–2025. The reference period is 2002–2012.

Stock Assessment

The next Atlantic Croaker Benchmark Stock Assessment is currently in progress and is scheduled for completion in 2026. The most recent benchmark stock assessment, completed in 2017, did not pass peer review and will not be used for management. The assessment was not recommended for management because of concern over uncertainty in biomass estimates due to conflicting signals among abundance indices and catch time series as well as sensitivity of model results to assumptions and model inputs (ASMFC 2017, ASMFC 2019). The review panel noted that discard estimates from the shrimp trawl fishery was an improvement from the last assessment and recommended shrimp trawl discard estimates be incorporated into annual monitoring using the TLA.

For reference, the most recent stock assessment accepted for use in management was completed in 2010 (ASMFC 2010). Results of the 2010 stock assessment indicated the population was not experiencing overfishing and was likely not overfished. The assessment indicated biomass had been increasing and the age-structure of the population had been expanding since the late 1980s. Biological reference points in the 2010 stock assessment are ratio based. Overfishing is occurring if F/F_{MSY} is greater than 1 and the stock is considered overfished if $SSB/(SSB_{MSY}(1-M))$ is less than 1.

DESCRIPTION OF THE FISHERY

Current Regulations

The 2020 TLA update (2019 terminal year) for Atlantic Croaker triggered at the 30% threshold and coastwide management action as outlined in Addendum III was enacted in March 2021. The management response outlined in Addendum III specifies, non de minimis states are required to implement a 50 fish bag limit for their recreational fishery and must reduce commercial harvest by 1% of the average state commercial harvest from the previous 10 years.

In North Carolina, the 50 fish per person per day recreational bag limit became effective April 15, 2021 (FF-24-2021) and has remained in place. The Atlantic Croaker commercial fishery closed December 16 through December 31, in 2021, 2022, 2023, 2024, and 2025 to meet the required 1% reduction (FF-65-2021, FF-58-2022, FF-59-2023, FF-50-2024, FF-51-2025). Measures were required to remain in place for at least 3 years and future TLA updates could determine future management action after this time. The TLA was not updated again until 2024 because of missing data due to the COVID-19 pandemic, vessel changes in contributing surveys, and because the benchmark stock assessment was originally planned for completion in 2024. Given that the stock assessment is now scheduled for completion in 2026, the Atlantic Croaker Technical Committee recommended and the Sciaenid Board approved current management measures to remain in place until results from the stock assessment are available.

Commercial Fishery

Data collected from the North Carolina Trip Ticket program indicates commercial harvest was at its greatest in the late 1990s to early 2000s peaking at 14,429,197 lb in 2003 and has generally declined over the past 2 decades (Table 1; Figure 3). Commercial landings in 2025 were similar to 2024 and were the highest since 2021. Landings in 2023 (249,468 lb) were the lowest since 1994. The sharp increase in landings in 2024 and 2025 was contributed primarily by the ocean gill net fishery (Figure 4). The ocean gill net fishery overtook the flynet fishery as the predominant source of Atlantic Croaker landings in 2011 and accounted for 90% of the total commercial landings in 2025. The estuarine gill net fishery is the second most dominant fishery for Atlantic Croaker and contributed 9% of landings in 2025. Atlantic Croaker are a component of the scrap or bait fishery in North Carolina, but this component generally makes up a small percentage of landings.

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Table 1. Atlantic Croaker recreational harvest and number released (Marine Recreational Information Program) and commercial harvest (North Carolina Trip Ticket Program), 1994–2025.

Year	Recreational			Commercial	Total Weight Landed (lb)
	Number Landed	Number Released	Weight Landed (lb)	Weight Landed (lb)	
1994	1,921,848	4,302,429	557,403	4,615,754	5,173,157
1995	1,632,366	2,024,031	602,628	6,021,304	6,623,932
1996	1,224,357	2,051,175	564,016	9,961,842	10,525,858
1997	1,142,169	2,367,265	550,949	10,711,667	11,262,616
1998	865,487	2,038,932	376,255	10,865,897	11,242,152
1999	1,042,224	2,848,626	525,970	10,185,507	10,711,477
2000	860,246	3,475,554	394,037	10,122,627	10,516,664
2001	1,285,029	2,387,491	647,119	12,017,424	12,664,543
2002	1,265,031	2,218,039	651,611	10,189,153	10,840,764
2003	1,127,298	2,765,303	708,487	14,429,197	15,137,684
2004	1,218,206	3,407,280	683,113	11,993,003	12,676,116
2005	672,437	3,038,472	323,380	11,903,292	12,226,672
2006	1,376,403	6,381,434	498,741	10,396,554	10,895,295
2007	1,058,663	3,933,603	336,486	7,271,163	7,607,649
2008	678,638	3,274,873	275,052	5,791,769	6,066,821
2009	958,128	5,623,278	359,703	6,135,452	6,495,155
2010	1,280,446	4,571,287	638,817	7,312,159	7,950,976
2011	873,659	7,005,152	360,390	5,054,186	5,414,576
2012	848,495	3,878,710	307,338	3,106,616	3,413,954
2013	1,300,804	6,729,556	453,881	1,927,938	2,381,819
2014	1,935,961	10,347,332	758,751	2,629,908	3,388,659
2015	1,437,019	9,632,560	557,735	1,819,020	2,376,755
2016	1,109,570	7,254,382	443,728	2,092,287	2,536,015
2017	666,930	4,631,445	237,160	1,008,015	1,245,175
2018	472,917	4,311,368	164,644	1,650,316	1,814,960
2019	651,268	3,634,211	224,337	1,278,340	1,502,677
2020	673,377	5,560,605	223,685	570,423	794,108
2021	1,066,533	9,539,047	376,121	540,619	916,740
2022	1,110,382	7,914,042	481,721	357,281	839,002
2023	597,690	4,722,440	201,056	249,463	450,519
2024	852,372	6,976,866	363,595	450,834	814,429
2025	912,291	7,516,747	393,340	474,434	867,774
Mean	1,066,195	4,886,360	445,039	5,722,920	6,167,959

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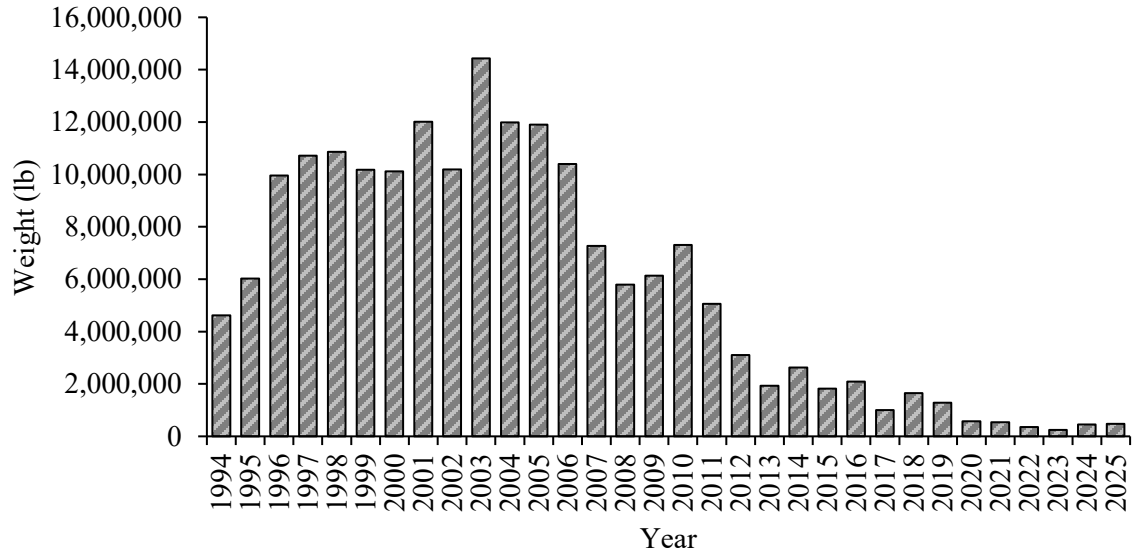


Figure 3. Annual commercial landings (North Carolina Trip Ticket Program) for Atlantic Croaker in North Carolina, 1994–2025.

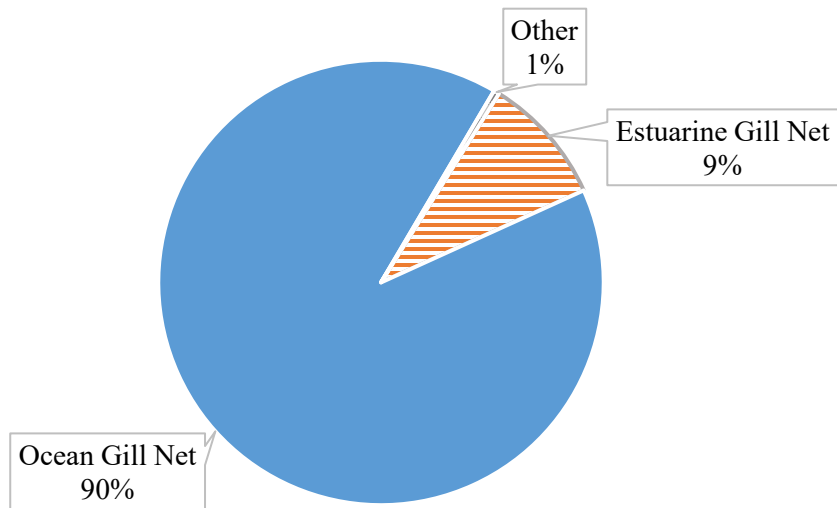


Figure 4. Commercial harvest of Atlantic Croaker by gear, 2025. Other gears include swipe net, beach seine, crab pots, haul seines and pound nets.

Recreational Fishery

Atlantic Croaker are targeted recreationally by shore-based anglers and those fishing from private vessels during the summer and fall. From 1994 through 2025 recreational harvest of Atlantic Croaker in North Carolina ranged from 164,644 to 758,751 lb or between 472,917 and 1,935,961 fish, peaking in 2014 and dropping to the lowest value in the time series in 2018 (Table 1; Figure 5). Recreational harvest since 2016 has remained under 500,000 lb and the five lowest annual harvest values have occurred within the most recent 10-year period. Harvest in 2025 increased from 2024 by approximately 30,000 lb and was the second highest value since 2016. The number of individuals harvested followed similar trends, declining from 2014 to the lowest value in the time series in 2018, then increasing until 2022, decreasing in 2023, and increasing in 2024 and 2025.

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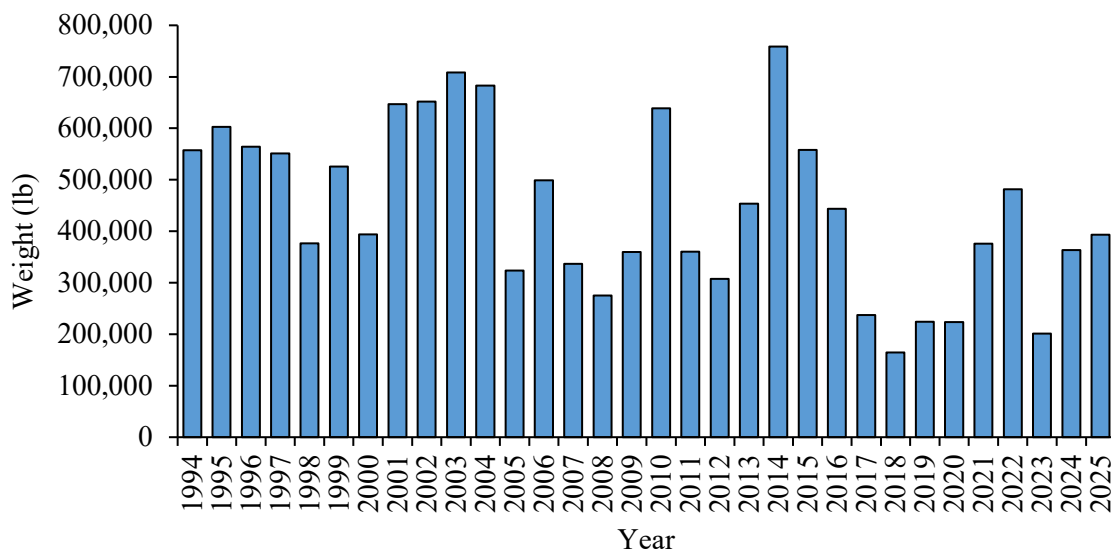


Figure 5. Annual recreational harvest (Marine Recreational Information Program) for Atlantic Croaker in North Carolina, 1994–2025.

The number of recreational releases has been variable over the time series with noticeable peaks in 2014 and 2021 (Table 1; Figure 6). The percentage of releases steadily increased between 1994 and 2025, ranging from 30% in 1989 to 90% in 2020, and has remained at 89% for the past 3 years (Figure 7). In 2025, anglers released 7,516,747 fish. Recreational releases follow a similar trend to recreational harvest.

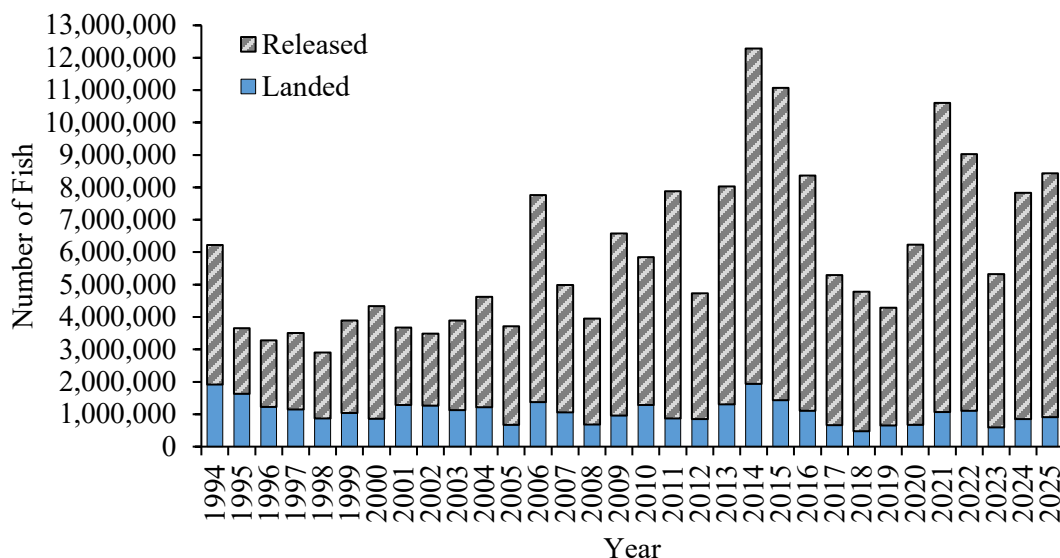


Figure 6. Recreational catch of Atlantic Croaker, 1994–2025 from MRIP.

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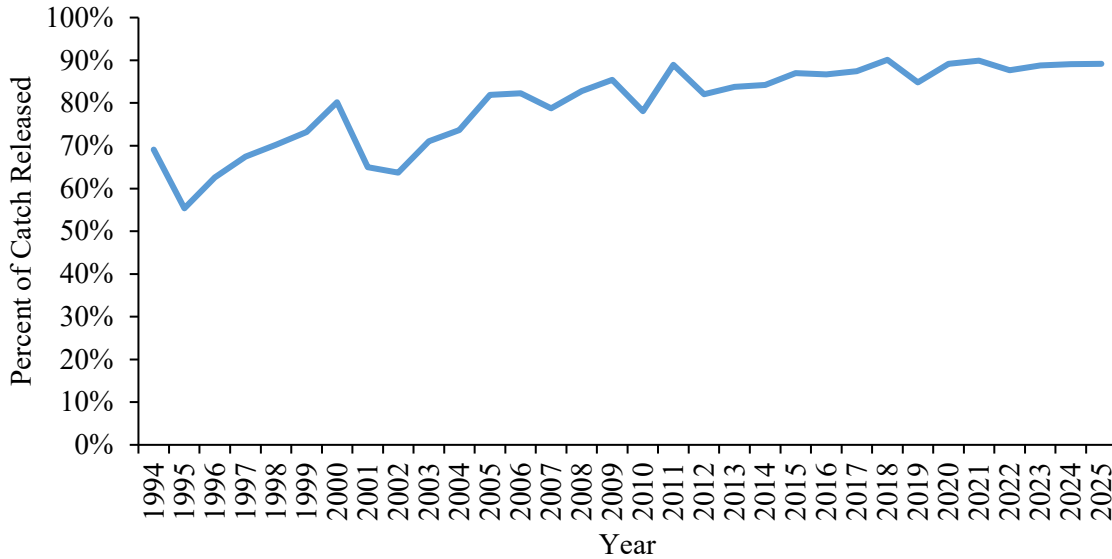


Figure 7. Percentage of recreational Atlantic Croaker catch released, 1994–2025 from MRIP.

The number of Atlantic Croaker measured during Marine Recreational Information Program (MRIP) sampling has generally declined, with 53 individuals measured in 2025, the lowest in the time series after 2024 when only 56 individuals were measured (Table 2). Mean TL in 2025 was 9.6 in, equal to that of 2024 and the greatest value since 2011. Mean TL has fluctuated little since 1989 ranging from 8.3 to 10.4 in. The maximum length observed in 2025 was 14.2 in, while the minimum length observed was 7.8 in, marking the highest annual minimum length since 1994. Most of the recreational catch consists of fish from 6.0 to 10.0 in TL (Figure 8). There was a wider range of lengths harvested during the 1990s and early 2000s relative to recent years (Figure 9). More fish around 10 in TL were observed in 2024 and 2025 relative to recent years.

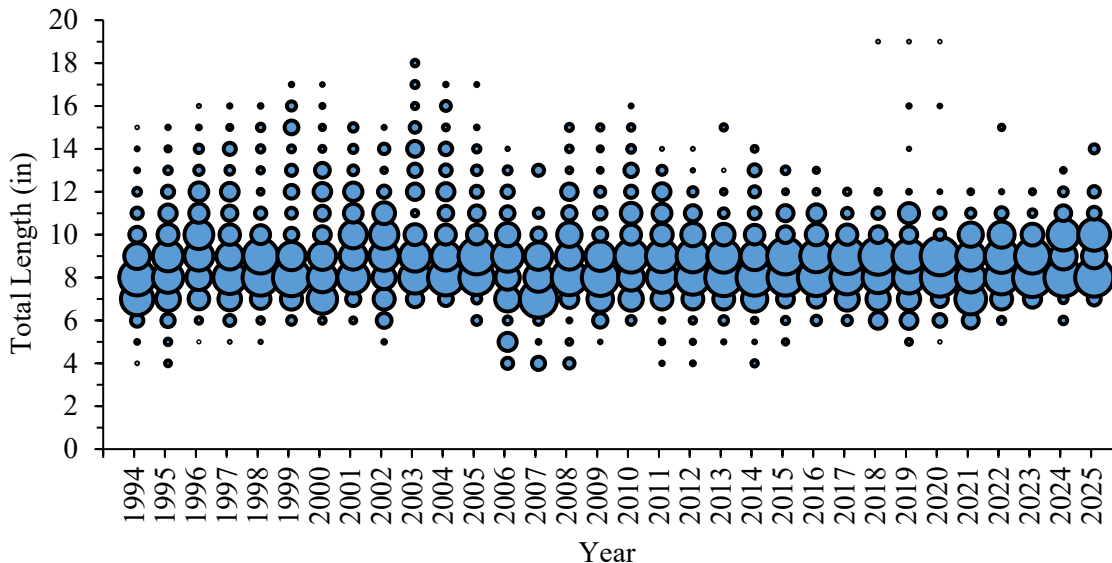


Figure 8. Recreational length frequency of Atlantic Croaker harvested, 1994–2025 (MRIP, $N = 11,882$). Bubbles represent fish at length and the bubble size is proportional to the number of fish at that length.

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Table 2. Mean, minimum, maximum length (TL, in), and total number of Atlantic Croaker measured by Marine Recreational Information Program sampling in North Carolina, 1994–2025.

Year	Mean Length	Minimum Length	Maximum Length	Total Number Measured
1994	8.6	4.8	15.6	2,065
1995	9.2	4.3	15.6	1,268
1996	10.0	5.3	16.7	1,169
1997	9.6	5.0	16.5	937
1998	9.3	6.0	16.7	599
1999	9.7	6.3	17.2	681
2000	9.6	6.7	17.6	360
2001	10.0	6.5	15.8	529
2002	9.7	6.0	15.0	255
2003	10.4	7.3	18.4	289
2004	10.1	7.0	17.4	263
2005	9.6	6.7	17.2	140
2006	8.8	4.8	14.9	198
2007	8.4	4.1	13.9	113
2008	9.4	4.3	15.4	188
2009	8.9	5.7	15.8	210
2010	9.8	6.2	16.8	330
2011	9.6	4.9	14.3	255
2012	9.2	4.9	14.1	230
2013	9.1	5.9	15.4	267
2014	9.1	4.1	14.1	215
2015	9.2	5.8	13.9	142
2016	9.3	6.3	13.2	219
2017	9.0	6.7	12.5	169
2018	8.9	6.5	19.1	119
2019	9.0	5.9	19.1	147
2020	8.9	5.9	19.1	127
2021	8.9	6.6	12.8	122
2022	9.3	6.3	15.7	76
2023	9.1	7.4	12.9	91
2024	9.6	6.1	13.5	56
2025	9.6	7.8	14.2	53

Harvest data from the Recreational Commercial Gear License (RCGL) were collected from 2002 to 2008. The program was discontinued in 2009 due to lack of funding. From 2002 to 2008, an average of 14,534 lb were harvested per year (NCDMF 2021b). Recreational estimates across all years have been updated and are now based on the MRIP Fishing Effort Survey-based calibrated estimates. For more information on MRIP see <https://www.fisheries.noaa.gov/topic/recreational-fishing-data>.

MONITORING PROGRAM DATA

Fishery-Dependent Monitoring

In 2025, 1,316 Atlantic Croaker lengths were obtained from commercial fish house sampling with a mean TL of 9.4 in, and lengths ranging from 5.9 to 13 in (Table 3). Mean TL has varied little, ranging from 9.4 to 12.1 in and has generally declined since 2005. Minimum TL ranged from 3.9 to 7.7 in and maximum TL ranged from 13 to 20.5 in. The minimum TL of 7.7 in observed in 2024 was the greatest minimum length

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sampled in the time series. Bait samples are not included in calculations of mean, minimum and maximum length.

Table 3. Mean, minimum, maximum length (TL, in), and total number of Atlantic Croaker measured from North Carolina commercial fish house samples, 1994–2025. Bait samples are not included.

Year	Mean Length	Minimum Length	Maximum Length	Total Number Measured
1994	9.4	4.6	15.2	20,162
1995	9.6	4.6	18.0	18,897
1996	10.8	4.3	18.3	32,310
1997	11.2	4.3	17.9	26,233
1998	11.6	3.9	19.7	22,816
1999	11.7	3.9	19.1	20,976
2000	11.6	3.9	20.5	29,024
2001	11.8	4.5	19.7	30,506
2002	11.9	5.1	19.7	21,990
2003	12.1	4.9	18.6	25,881
2004	12.0	3.9	20.0	23,330
2005	12.0	4.9	19.7	21,719
2006	11.4	4.7	19.2	20,533
2007	11.4	4.6	19.4	15,011
2008	11.1	4.6	19.5	15,032
2009	11.2	4.8	19.1	20,448
2010	11.2	5.0	17.8	21,511
2011	11.5	4.6	16.6	15,948
2012	11.2	5.7	17.9	10,923
2013	11.1	5.6	17.2	9,059
2014	10.4	4.4	16.7	11,523
2015	10.8	5.4	15.5	9,593
2016	10.7	7.4	15.2	6,959
2017	10.1	6.6	15.2	6,022
2018	10.4	6.2	15.2	3,771
2019	9.9	6.1	15.2	4,775
2020	9.5	5.4	13.3	1,807
2021	9.6	5.9	13.7	4,242
2022	9.6	7.1	13.9	2,850
2023	9.5	4.7	15.5	1,894
2024	9.7	7.7	16.9	1,452
2025	9.4	5.9	13.0	1,316

Modal length generally increased from 1994 to the early 2000s (Figure 9). There is a noticeable decline and contraction in size classes beginning in 2015, with most fish falling between 7.0 and 11.0 in. Size trends in 2025 commercial samples indicate a dominance of 8.5- to 9.5-in fish with few over 10.0 in or under 8.0 in (Figure 10).

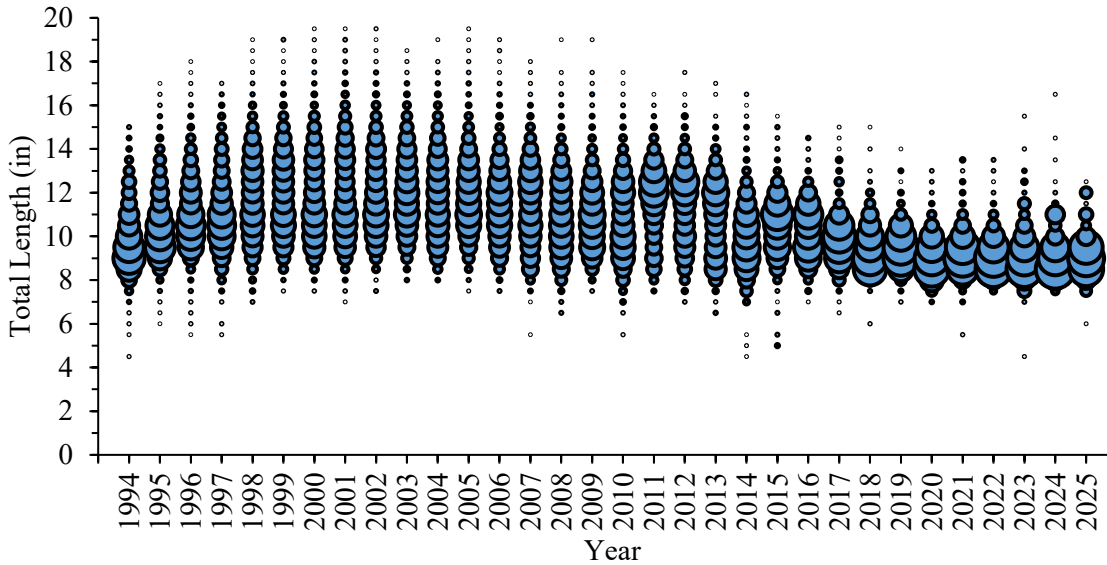


Figure 9. Commercial length frequency of Atlantic Croaker harvested from 1994–2025 ($N = 478,513$). Bubbles represent fish at length and the bubble size is proportional to the number of fish at that length. Bait samples not included.

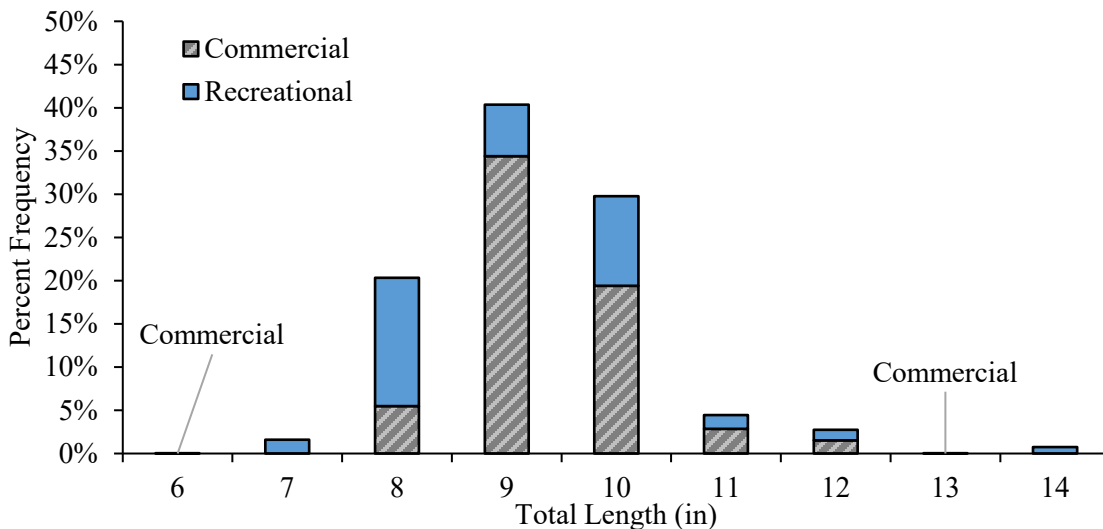


Figure 10. Commercial and recreational length frequency distribution from Atlantic Croaker harvested in 2025.

Fishery-Independent Monitoring

The number of Atlantic Croaker aged in North Carolina’s comprehensive life history program (P930) from 1997 through 2025 has ranged from 237 in 2011 to 1,070 in 2014 (Table 4). Modal age was 1 or 2 in most years but has been 0 in some years including 2008, 2016, 2017, and 2020. Minimum age was 0 in every year while maximum age ranged from 6 to 15 years. Maximum age was between 11 and 15 years from 2001–2010 and between 6 and 10 from 2011–2024. A total of 470 fish were aged in 2025 with a modal age of 1 and a maximum age of 9. There is significant overlap in length at age for most observed ages, though length does not exceed 22 in in any age class (Figure 11).

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Table 4. Modal, minimum, maximum age, and total number of Atlantic Croaker aged in North Carolina from fishery dependent and fishery independent sampling, 1997–2025. Includes otolith ages only, from only samples where a length was obtained.

Year	Modal Age	Minimum Age	Maximum Age	Total Number Aged
1997	1	0	9	428
1998	1	0	9	1,071
1999	1	0	9	671
2000	1	0	9	815
2001	2	0	12	793
2002	1	0	11	605
2003	1	0	12	516
2004	2	0	13	681
2005	3	0	14	597
2006	2	0	13	658
2007	5	0	15	321
2008	0	0	15	739
2009	1	0	14	709
2010	4	0	13	703
2011	1	0	8	237
2012	2	0	7	349
2013	1	0	8	577
2014	2	0	8	1,070
2015	1	0	9	993
2016	0	0	6	474
2017	0	0	7	451
2018	1	0	8	544
2019	2	0	10	537
2020	0	0	7	380
2021	1	0	9	486
2022	2	0	9	580
2023	1	0	6	556
2024	1	0	7	465
2025	1	0	9	470

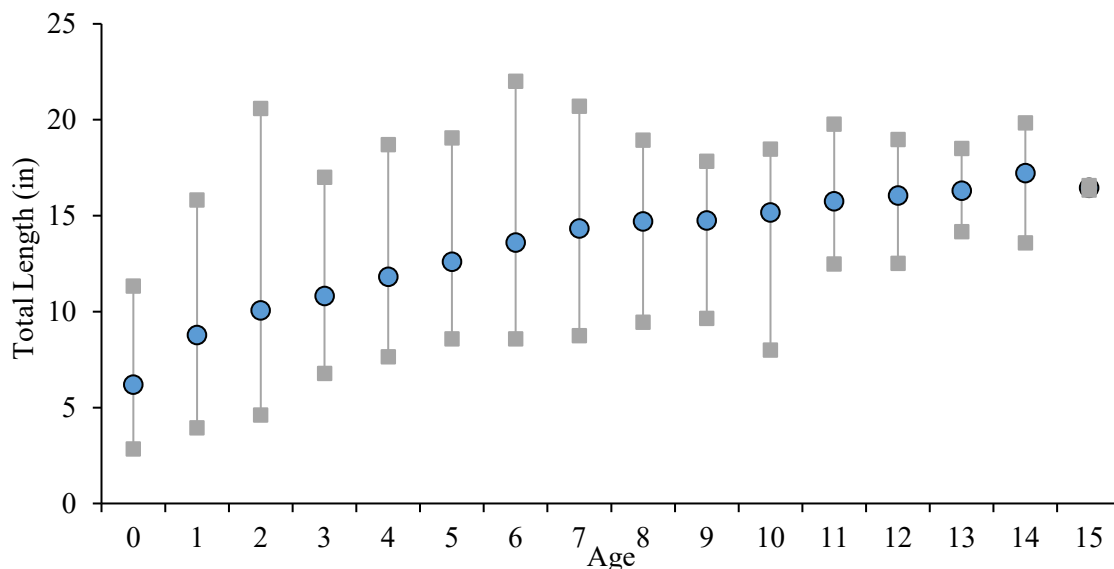


Figure 11. Atlantic Croaker length at age based on age samples collected from 1997 to 2025 ($N = 17,476$). Blue circles represent the mean size at a given age while the grey squares represent the minimum and maximum observed size for each age. Only ages derived from otoliths and from samples where lengths were obtained were used.

The Pamlico Sound Survey (P195) samples 54 stations (grids) annually in June and September. Stations are randomly selected from strata based upon depth and geographic location. Tow duration is 20 min, using double rigged demersal mongoose trawls (9.1 m headrope, 1.0 X 0.6 m doors, 2.2-cm bar mesh body, 1.9-cm bar mesh cod end and a 100-mesh tailbag extension). Data from this survey were used to produce juvenile abundance indices (JAI) that are incorporated into ASMFC stock assessments and reported annually to ASMFC as part of compliance reports and for incorporation into the juvenile composite TLA. Juvenile Atlantic Croaker are defined as fish <140 mm TL (5.5 in) in June, and fish <210 mm TL (8.3 in) in September. The North Carolina Pamlico Sound Trawl Survey (Program 195) was suspended indefinitely starting in 2025.

The COVID pandemic impacted sampling in 2020 and 2021. 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. In 2020, sampling was limited to 28 stations sampled in June and 35 stations sampled in September. A total of 35 stations were sampled in June 2021, and 33 stations were sampled in September 2021. Limited sampling likely impacted abundance indices calculated from Sound Survey data. An initial analysis of this impact was conducted for the 2020 Atlantic Croaker abundance indices and concluded the magnitude of abundance may be overestimated slightly but limited sampling was likely able to capture general abundance trends.

The Atlantic Croaker weighted JAI from the Pamlico Sound Survey from 1987 through 2024 has been variable in both June and September. Annual fluctuations in the June JAI are most notable after 2009 when steep increases in abundance are followed by steep declines (Figure 1A). The June JAI has ranged from 66 individuals per tow in 1996 to 1,149 individuals per tow in 2010 with a time series average of 361 individuals per tow. The time series average in September is greater at 525 individuals per tow ranging from 96 individuals per tow in 1987 to 1,376 individuals per tow in 2020 (Figure 1B). The September JAI fluctuates around the time series average. The JAI for September increased sharply from 657 individuals per tow in 2023 to 1,068 individuals per tow in 2024. The June JAI in 2024 was 115 individuals per tow, continuing the decline from June 2020.

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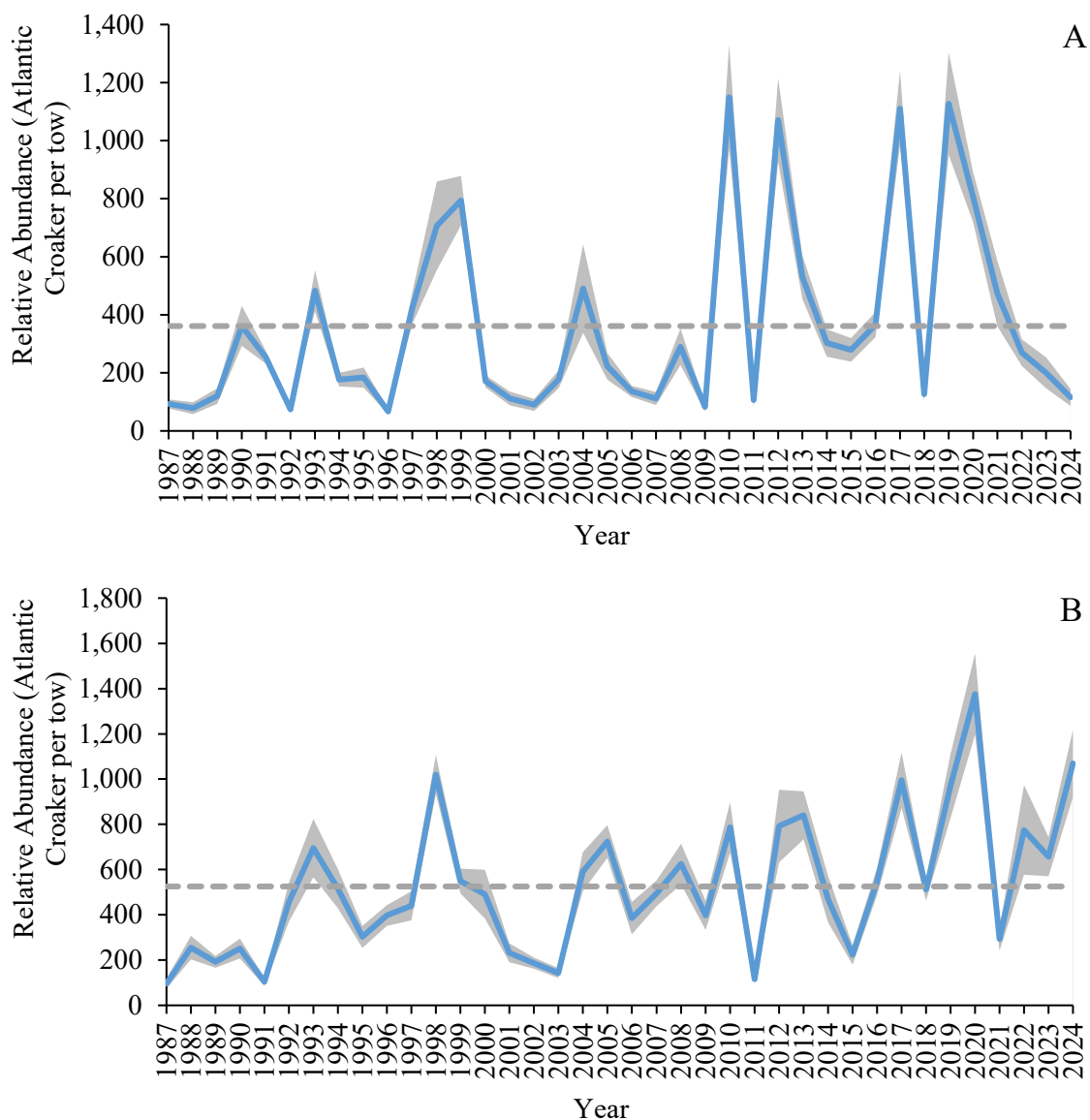


Figure 12. Atlantic Croaker weighted juvenile relative abundance for A) June and B) September from the Pamlico Sound Survey, 1987–2024. The shaded area represents standard error. Dashed line represents the time series average. Length cutoffs are <140 mm TL (5.5 in) in June and <210 mm TL (8.3 in) in September.

Most Atlantic Croaker captured in the Pamlico Sound Survey are juveniles (age 0), but because of the protracted spawning and recruitment period, the length composition of Atlantic Croaker captured in the survey can be variable. There is more variability in length compositions of Atlantic Croaker caught in the June portion of the survey compared to the September portion of the survey (Figure 13). Modal length in June is generally 3.0 to 5.0 in while modal length in September is around 5.0 to 5.5 in with little fluctuation between years. In many years, two distinct size classes are apparent from the length frequencies of fish captured in June.

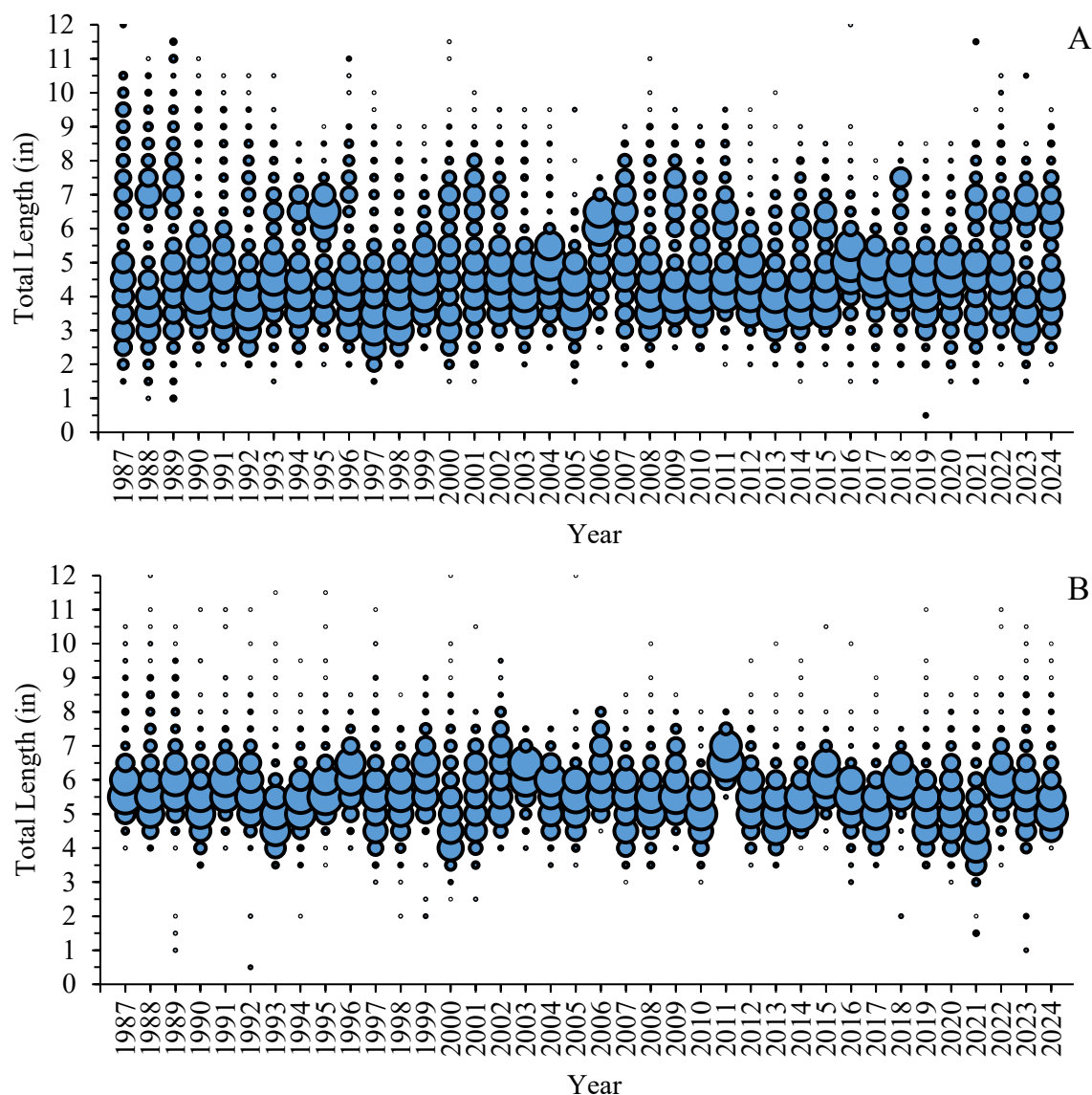


Figure 13. Length frequency of all Atlantic Croaker captured in Pamlico Sound Survey sampling during A) June and B) September 1987–2024. Bubbles represent fish at length and the bubble size is proportional to the number of fish at that length.

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 Roanoke Island south through the South Carolina border each year without deviation one sample for each station each month during the months of May and June. Sampling in May of 2020 did not occur due to sampling limitations enacted during the COVID pandemic. Data from this survey were used to produce an Atlantic Croaker JAI from 1989 to 2024. The length cutoff used to define age-0 Atlantic Croaker was <140 mm TL (5.5 in).

The Atlantic Croaker JAI for P120 has been variable throughout the time series (Figure 14). Peaks in relative abundance occurred in 1998, 2010, and 2021, while the lowest values in the time series occurred in 1991, 1996, 2006, 2011, and 2022. Abundance has fallen below the time series average (1989 to 2025;

68.5 fish per tow) in eight of the most recent 10 years and has remained below the average since 2022. Atlantic Croaker captured in P120 are generally under 100 mm TL (Figure 15). Modal length was most frequently between 1.5 in and 2.5 in across the time series, but was unusually low in 2025, with most fish falling between 0.5 in and 1 in.

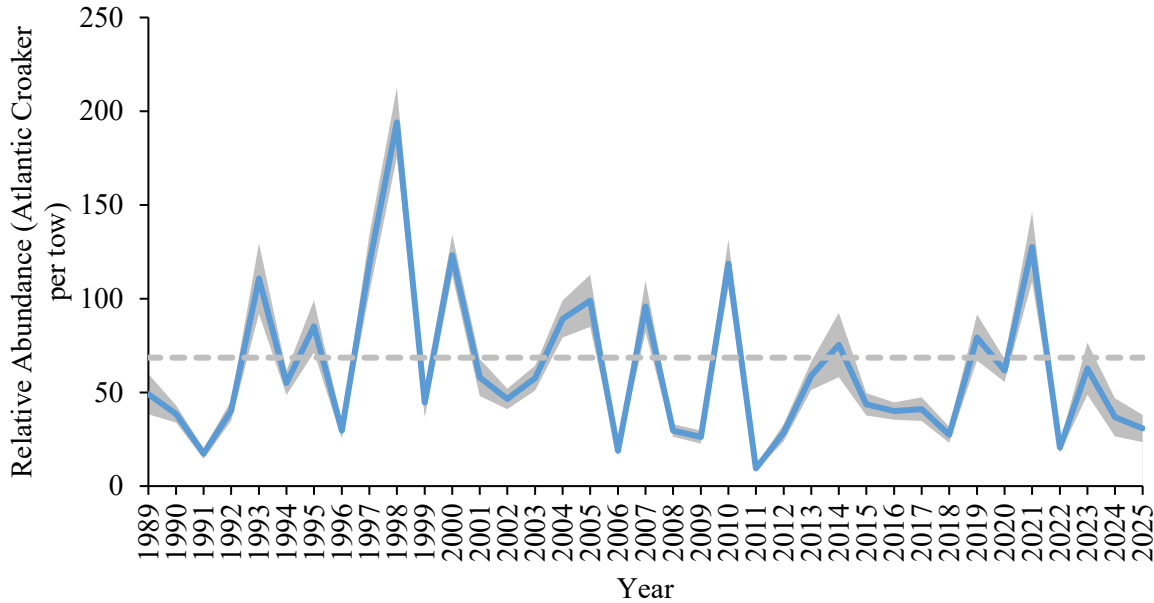


Figure 14. Atlantic Croaker juvenile weighted abundance index for May and June combined from the Estuarine Trawl Survey, 1989–2025. Shaded area represents standard error. Dashed line represents the time series average. The length cutoff used to identify Age-0 fish was <140 mm TL (5.5 in).

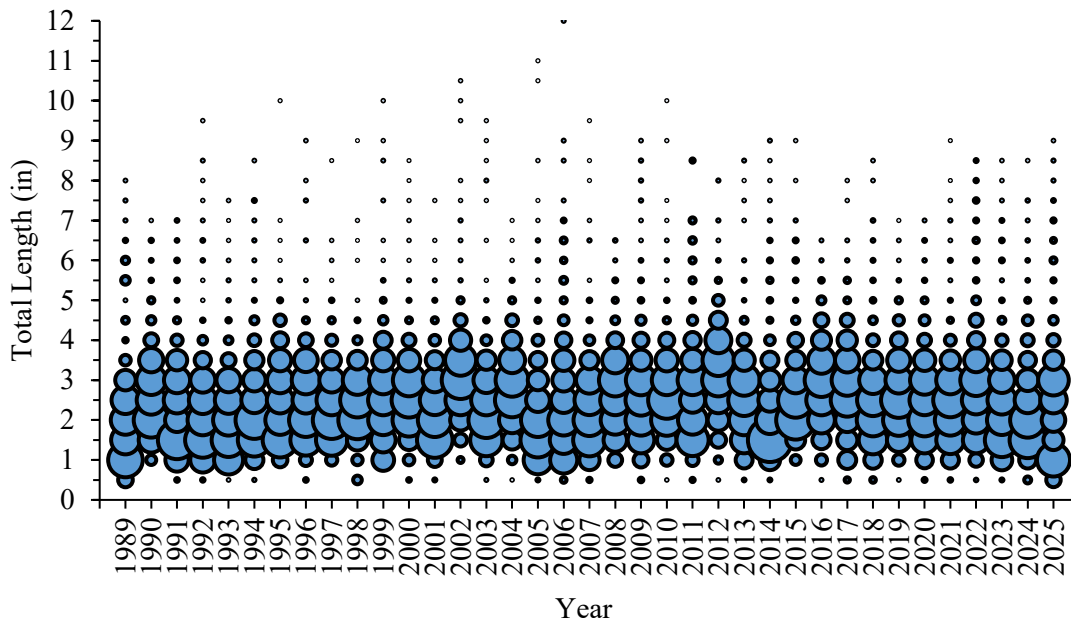


Figure 15. Length frequency of all Atlantic Croaker captured in Estuarine Trawl Survey sampling during May and June 1989–2025. Bubbles represent fish at length and the bubble size is proportional to the number of fish at that length.

RESEARCH NEEDS

There is no research or monitoring programs required of the states except for the submission of an annual compliance report. However, several coastwide and state specific research recommendations have been identified and ranked through the ASMFC FMP and stock assessment process. The high priority research recommendations are reported below. Additional research and monitoring recommendations can be found in the 2016 Atlantic Croaker Stock Assessment Peer Review Report here under Term of Reference 8 (ASMFC 2017).

- Describe the coast-wide distribution, behavior, and movement of croaker by age, length, and season, with emphasis on collecting larger, older fish.
- Continue state and multi-state fisheries-independent surveys throughout the species range and subsample for individual lengths and ages. Ensure NEFSC trawl survey continues to take lengths and ages. Examine potential factors affecting catchability in long-term fishery independent surveys.
- Quantify effects of BRDs and TEDs implementation in the shrimp trawl fishery by examining their relative catch reduction rates on Atlantic Croaker.
- Continue to develop estimates of length-at-maturity and year-round reproductive dynamics throughout the species range. Assess whether temporal and/or density-dependent shifts in reproductive dynamics have occurred.
- Re-examine historical ichthyoplankton studies for an indication of the magnitude of estuarine and coastal spawning, as well as for potential inclusion as indices of spawning stock biomass in future assessments. Pursue specific estuarine data sets from the states (NJ, VA, NC, SC, DE, ME) and coastal data sets (MARMAP, EcoMon).

MANAGEMENT

The TLA established under Addendum II and revised under Addendum III (approved February 2020) to Amendment I is used as a precautionary management framework for Atlantic Croaker. The TLA provides guidance in lieu of a current stock assessment. Addendum III incorporated the use of a regional approach (Mid-Atlantic NJ-VA and South Atlantic NC-FL) to better reflect localized fishery trends. Under this management program, if the amount of red in the Traffic Light for both population characteristics (adult abundance and harvest) meet or exceed the threshold for any three of the four most recent years, then management action is required. The harvest composite index triggered at the 30% threshold in both regions in 2019. The adult abundance characteristics for the Mid-Atlantic exceeded the threshold in 2019 while the South Atlantic abundance composite characteristic did not exceed the trigger in 2019. Since both population characteristics were above the 30% threshold in at least 3 years from 2016–2019, management actions were implemented in March 2021. Management measures will remain in place for at least 3 years and future TLA updates will determine future management action after this time. The ASMFC Sciaenids Board has selected to maintain current management measures until results of the benchmark stock assessment planned for completion in 2026 may be considered.

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