

STATE MANAGED SPECIES – KINGFISHES

FISHERY MANAGEMENT PLAN UPDATE KINGFISHES AUGUST 2026

STATUS OF THE FISHERY MANAGEMENT PLAN

Fishery Management Plan History

Original FMP Adoption:	November 2007
Amendments:	None
Revisions:	None
Supplements:	None
Information Updates:	December 2015 August 2020
Schedule Changes:	None
Comprehensive Review:	2025

The original 2007 North Carolina Kingfish Fishery Management Plan (FMP) developed management strategies that ensure a long-term sustainable harvest for recreational and commercial fisheries in North Carolina. The plan established the use of trend analysis and management triggers to monitor the viability of the stock. The N.C. Marine Fisheries Commission (NCMFC) also approved a rule which included proclamation authority for the North Carolina Division of Marine Fisheries (NCDMF) Director to impose restrictions on season, areas, quantity, means and methods, or size of kingfish (NCMFC Rule 15A NCAC 03M .0518), if needed. An Information Update was completed for the Kingfish FMP in November 2015. The best available data and techniques used for the trend analysis and management triggers were refined and modified to better assess population trends as part of the 2015 Information Update. The annual FMP Update in 2020 served as the formal review of the Kingfish FMP. The next review began in July 2025 after two triggers were exceeded 2 years in a row.

Management Unit

The Kingfish FMP includes the kingfishes in all coastal fishing waters of North Carolina. The fishery includes three species: Southern Kingfish (*Menticirrhus americanus*), Gulf Kingfish (*M. littoralis*), and Northern Kingfish (*M. saxatilis*). Southern Kingfish is designated as the indicator species for this assemblage. The management unit identified in this plan does not encompass the entire unit stock range for any of the three species of kingfishes inhabiting North Carolina. For this reason, a state-specific stock assessment cannot be conducted, and a regional stock assessment approach is recommended as the most appropriate mechanism for determining stock status and the long-term viability of these stocks (NCDMF 2007).

Goal and Objectives

The goal of the 2007 Kingfish FMP was to determine the health of the stocks and ensure the long-term sustainability of the kingfish stocks in North Carolina (NCDMF 2007). To achieve this goal, it is recommended that the following objectives be met:

- Develop an objective management program that provides conservation of the resource and sustainable harvest in the fishery.
- Ensure that the spawning stock is of sufficient capacity to prevent recruitment overfishing.
- Address socio-economic concerns of all user groups.

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- Restore, improve, and protect critical habitats that affect growth, survival, and reproduction of the North Carolina stock of kingfishes.
- Evaluate, enhance, and initiate studies to increase our understanding of kingfishes' biology and population dynamics in North Carolina.
- Promote public awareness regarding the status and management of the North Carolina kingfishes stocks.

DESCRIPTION OF THE STOCK

Biological Profile

Three species of kingfishes occur in North Carolina: Southern, Gulf, and Northern. Kingfish refers to a single species while kingfishes refers to multiple species. Kingfishes are demersal (live near and feed on the bottom) members of the drum family. Southern Kingfish is the most abundant kingfish species from North Carolina to the east coast of Florida and Gulf of Mexico with a range extending as far as Cape May, New Jersey southward to Buenos Aires, Argentina. Northern Kingfish is the most abundant kingfish species from Massachusetts to North Carolina, with a range extending from the Gulf of Maine to Brazil. Gulf Kingfish is the most abundant kingfish species in the surf zone south of Cape Hatteras, North Carolina, and has a range extending from Virginia to Rio Grande, Brazil. Northern Kingfish and Southern Kingfish prefer mud or sand-mud bottom types while Gulf Kingfish prefer the sandy bottoms of the surf zone. Kingfishes move from estuarine and nearshore ocean waters to deeper offshore waters as water temperature cools. Spawning takes place in the ocean from April to October. The kingfishes have several regional names including sea mullet, king whiting, king croaker, sea mink, roundhead, hard head, whiting, hake, Carolina whiting, and Virginia mullet.

Stock Status

The stocks of kingfishes are unassessed, thus overfishing and overfished status cannot be determined. A coast-wide stock assessment is a high research priority that needs to be addressed before biological reference points relative to overfished and overfishing can be determined.

Stock Assessment

A quantitative stock assessment is not available for kingfishes in North Carolina; therefore, no determination can be made relative to an overfishing or overfished status. Prior attempts at a stock assessment during the 2007 FMP development were not successful, primarily due to limited data. From these prior attempts, all reviewers noted a lack of migration (mixing) data to determine the movement patterns of kingfishes along North Carolina and the entire Atlantic coast. A regional (multi-state) stock assessment approach is likely needed to best determine the stock status for kingfishes along the Atlantic coast including North Carolina. In 2008 and 2014, Atlantic States Marine Fisheries Commission (ASMFC) South Atlantic Board met to consider regional management by reviewing data on kingfishes. However, due to no major concerns with kingfish stocks, it was decided no further action was necessary. As a result, kingfishes management in North Carolina continues to fall solely within the framework of the state FMP process.

The 2007 Kingfish FMP selected the use of trend analysis with management triggers as the management strategy to monitor the viability of the kingfish stocks in North Carolina (NCDMF 2007). During the review of the 2007 Kingfish FMP as part of the 2015 FMP Information Update and 2020 FMP Information Update, best available data and techniques used for the trend analysis and management triggers were refined and modified to better assess population trends. The trend analysis incorporates management triggers to alert the NCDMF and NCMFC to the potential need for management action based on stock conditions. The activation of any two management triggers (regardless of trigger category) 2 years in a row warrants further evaluation of the data and potential management action. The analysis is updated each year and all trends

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relative to management triggers are provided as part of this annual update. Current management triggers based on Southern Kingfish use fishery independent indices of relative abundance for young-of-year (YOY) and adult fish, the proportion of adults greater than size at 50% maturity (L_{50}), and a relative fishing mortality (F) index. Young-of-year fish includes new fish that enter the population that year. L_{50} is the length at which 50% of the adult population is sexually mature and ready to spawn.

DESCRIPTION OF THE FISHERY

Current Regulations

The only rule which specifically refers to Kingfish is 15A NCAC 03J .0202(5) which states it shall be unlawful to possess finfish (including pursuant to 15A NCAC 03M .0102) incidental to shrimp or crab trawl operations from December 1 through March 31 unless the weight of the combined catch of shrimp and crabs exceeds the weight of finfish, except an additional 300 pounds of Kingfish (*Menticirrhus* spp.) may be taken south of Bogue Inlet.

Commercial Fishery

Commercial landings for kingfishes include Southern, Northern, and Gulf kingfishes combined. Landings have fluctuated historically but have generally been increasing since 2018. However, in 2024, landings (630,113 lb) decreased 24.5% from 2023 (834,073 lb) and another 5.5% in 2025 (595,667 lb; Table 1; Figure 1). The average landings from 2012 to 2025 was 727,736 lb. Harvest of kingfishes is seasonal with peak landings in April and November. Peaks in landings coincide with seasonal movements of kingfishes along the Atlantic coast.

Table 1. Recreational harvest and releases and commercial harvest of kingfishes from North Carolina for the period 2012–2025.

Year	Recreational			Commercial	Total Weight Landed (lb)
	Number Landed	Number Released	Weight Landed (lb)	Weight Landed (lb)	
2012	3,444,198	3,665,650	1,817,036	595,678	2,412,714
2013	5,878,621	6,069,054	3,033,098	603,938	3,637,036
2014	5,545,371	6,959,625	3,547,551	952,434	4,499,985
2015	5,503,437	4,850,506	3,183,030	783,755	3,966,785
2016	4,149,467	4,076,760	2,266,555	837,818	3,104,373
2017	3,387,470	4,075,827	2,193,835	941,370	3,135,205
2018	1,731,340	2,180,732	1,101,676	406,857	1,508,533
2019	3,370,636	4,152,004	2,004,432	700,962	2,705,394
2020	3,865,039	3,461,090	2,505,138	638,849	3,143,987
2021	8,425,767	5,593,293	6,074,204	802,108	6,876,312
2022	5,594,758	4,197,192	3,430,662	836,685	4,267,347
2023	3,003,875	2,817,382	1,830,414	834,073	2,664,487
2024	3,041,109	3,874,384	1,958,565	630,113	2,588,678
2025	2,894,793	4,065,674	1,920,913	595,667	2,516,580
Mean	4,273,992	4,288,512	2,633,365	725,736	3,359,101

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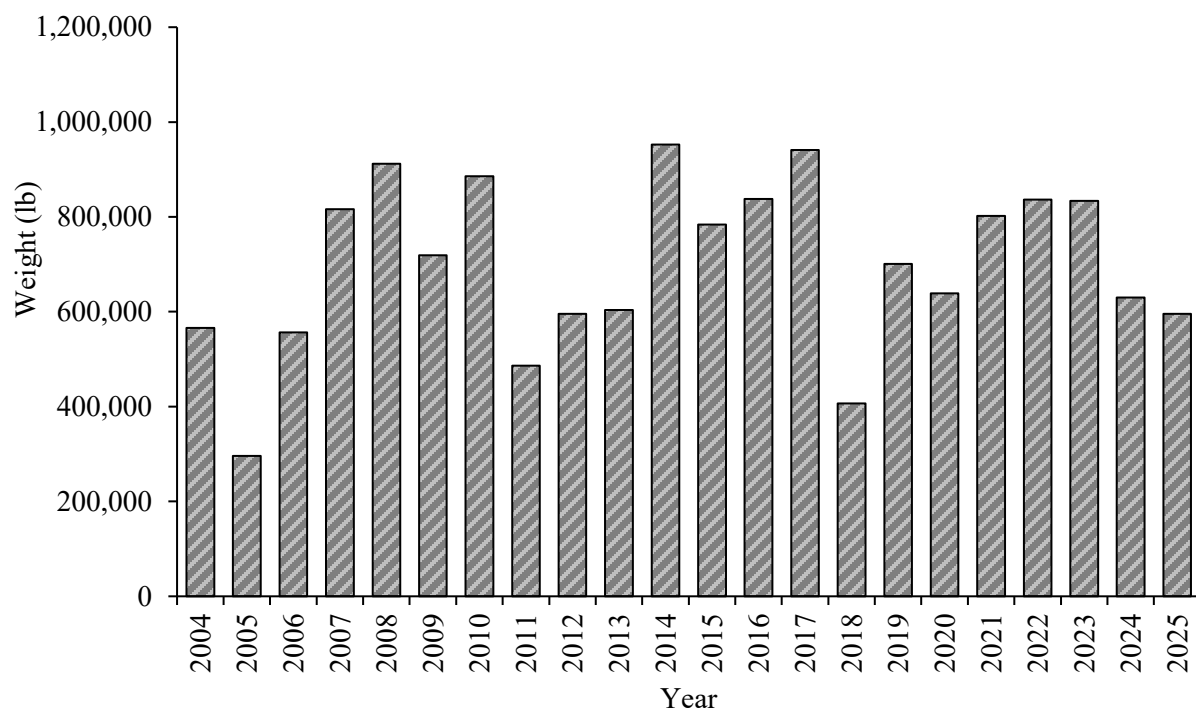


Figure 1. Commercial landings of kingfishes reported through the North Carolina Trip Ticket Program, 2004–2025.

Recreational Fishery

Recreational landings of kingfishes are estimated from the Marine Recreational Information Program (MRIP). Recreational estimates across all years have been updated and are now based on the new Fishing Effort Survey-based calibrated estimates. For more information on MRIP see [here](#).

Recreational landings for kingfishes include Southern Kingfish, Northern Kingfish, and Gulf Kingfish. A large portion of landings are reported to MRIP as kingfish at the genus level. Total recreational landings have fluctuated but have been generally increasing since 2018 (Table 1; Figure 2). Low landings in 2018 were likely due to impacts from Hurricane Florence. In 2023, recreational landings (1,830,414 lb) decreased 46.7% from 2022 (3,430,662 lb) and remained relatively low since (1,920,913 lb in 2025; Table 1; Figure 2). The average recreational landings from 2012–2025 was 2,633,365 lb. Most kingfishes are landed from the ocean and are caught from man-made structures, such as piers, jetties, bridges, or from beaches. A smaller portion of kingfishes are caught in estuarine waters by anglers fishing from private vessels. Recreational harvest of kingfishes is seasonal with most fish harvested during the spring and the fall, and the lowest numbers harvested during the summer.

The North Carolina Saltwater Fishing Tournament recognizes anglers for landing and/or releasing fish of exceptional size or rarity by issuing citations that document the capture for the angler. Citations were awarded for kingfishes landed larger than 1.5 lb prior to May 1, 2021, and since then have been awarded to kingfishes landed larger than 2 lb. Citations awarded through the North Carolina Saltwater Fishing Tournament for kingfishes have varied by year throughout the time series (1991–2025), averaging 223 citations (Figure 3). The number of citations awarded in 2025 (155 citations) stayed fairly consistent to the number of citations awarded in the previous year (159 citations in 2024). The decrease in awarded citations beginning in 2021 may be partially due to the increase in weight required to qualify for a citation effective May 1, 2021.

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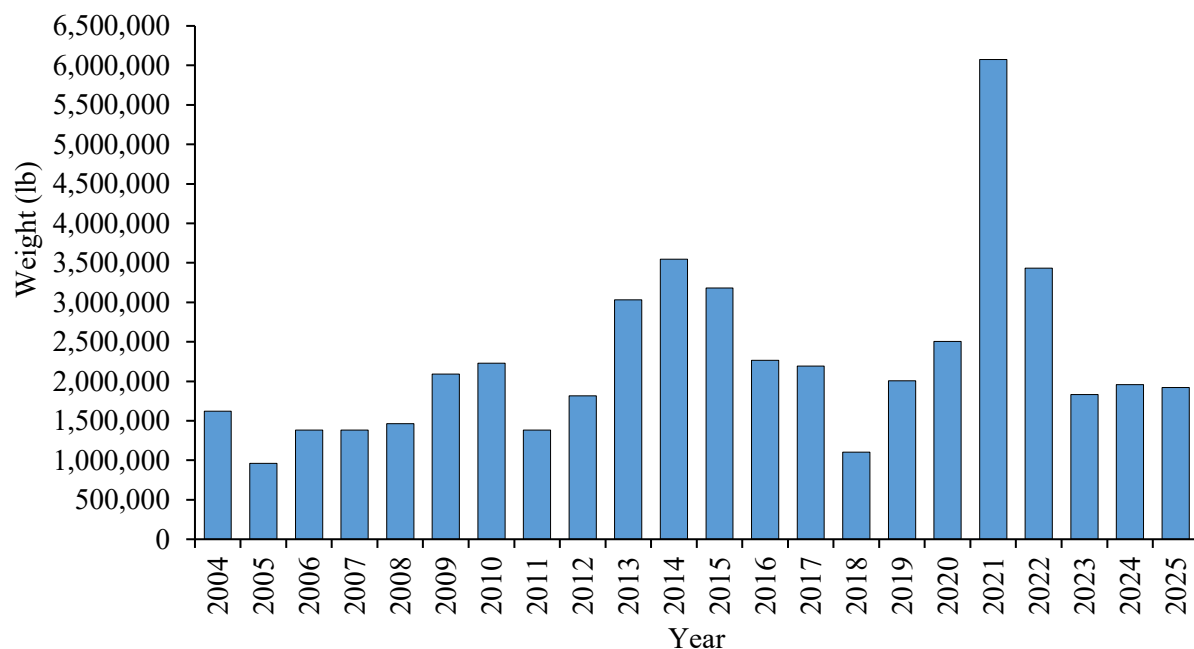


Figure 2. Recreational landings (Type A + B1) of kingfishes estimated from the Marine Recreational Information Program survey for North Carolina from 2004–2025.

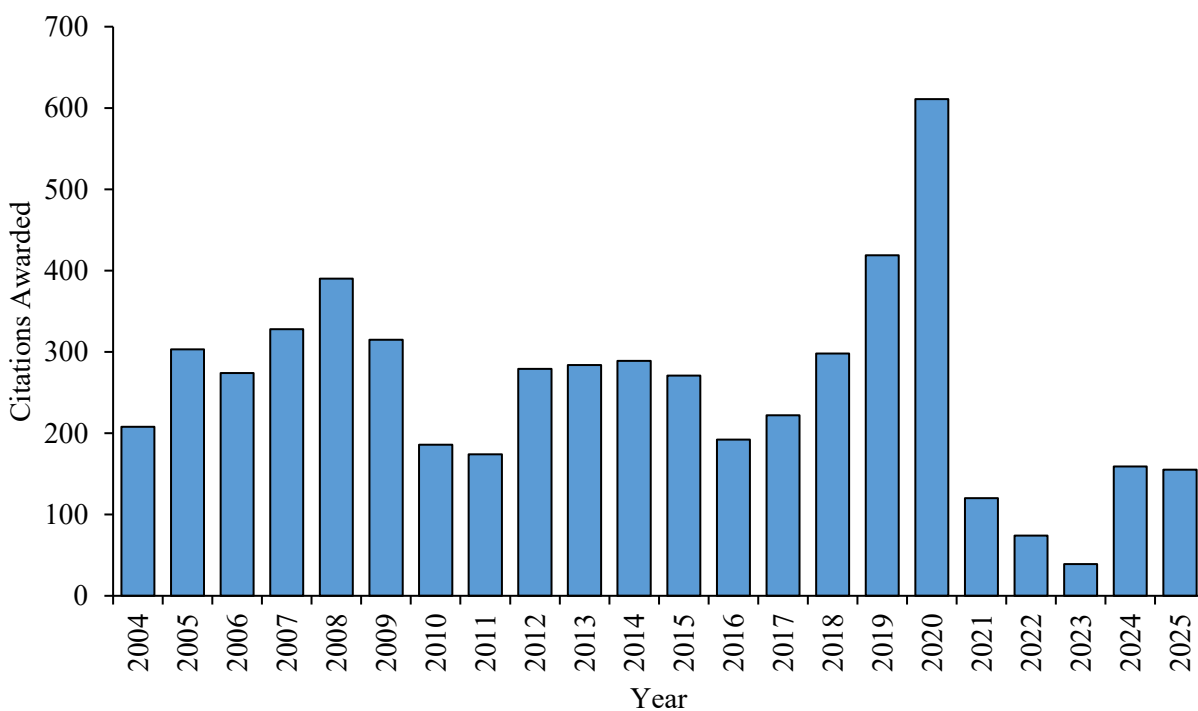


Figure 3. North Carolina Saltwater Fishing Tournament citations awarded for kingfishes, 2004–2025. Citations are awarded for kingfishes >2 lb landed. Prior to May 1, 2021, citations were awarded for kingfishes >1.5 lb landed.

MONITORING PROGRAM DATA

Fishery-Dependent Monitoring

Kingfishes are sampled from a variety of commercial fishery surveys, including the estuarine long haul, ocean trawl, pound net, ocean gill net, estuarine gill net, and ocean beach seine fisheries in North Carolina. No kingfish were sampled from the shrimp trawl fishery; however, the length frequencies typically observed in that fishery were similar to those from the estuarine long-haul fishery. Therefore, length distributions from the estuarine long-haul fishery were applied to the landings associated with the shrimp trawl fishery. A total of 35,467 kingfishes were measured from 2013 to 2025 (31,188 Southern, 2,122 Northern and 2,157 Gulf; Table 2; Figure 4). Mean total length (TL) for Southern Kingfish ranged from 11.3 to 12.0 in, with a minimum of 6.5 in and a maximum of 24.8 in. Mean length for Northern Kingfish ranged from 12.1 to 14.1 in, with a minimum of 8.1 in and a maximum of 18.6 in. Mean length for Gulf Kingfish ranged from 12.0 to 12.9 in with a minimum of 6.4 in and a maximum of 18.3 in. The length composition and modal length of kingfishes caught in the commercial fishery has been stable since 2004 (Figure 4). Most of the commercial catch consists of kingfishes from 10 to 12 in TL (Figure 4). The length frequency distribution of kingfishes harvested in the commercial and recreational fisheries are generally similar; however, recreational anglers harvested a wider length range of kingfishes in 2025 (Figure 5).

Recreational lengths are collected as part of MRIP by recreational port agents. Over time, kingfish only identified to the genus, *Menticirrhus*, have increased and have now made up more than 50% of total reported recreational landings. To account for this and the decreasing number of interviews, lengths are reported at the genus level to reduce the associated percent standard error (PSE) associated with the data. A total of 9,822 directed trips targeting kingfishes were intercepted from 2013 to 2025 (Table 3; Figure 6). Mean TL for kingfish ranged from 9.9 to 11.5 in, with a minimum of 4 in and a maximum of 19 in. The length composition and modal length of kingfishes caught in the recreational fishery has been stable since 2004 (Figure 6). Most of the recreational catch consists of kingfishes from 9 to 12 in (Figure 6).

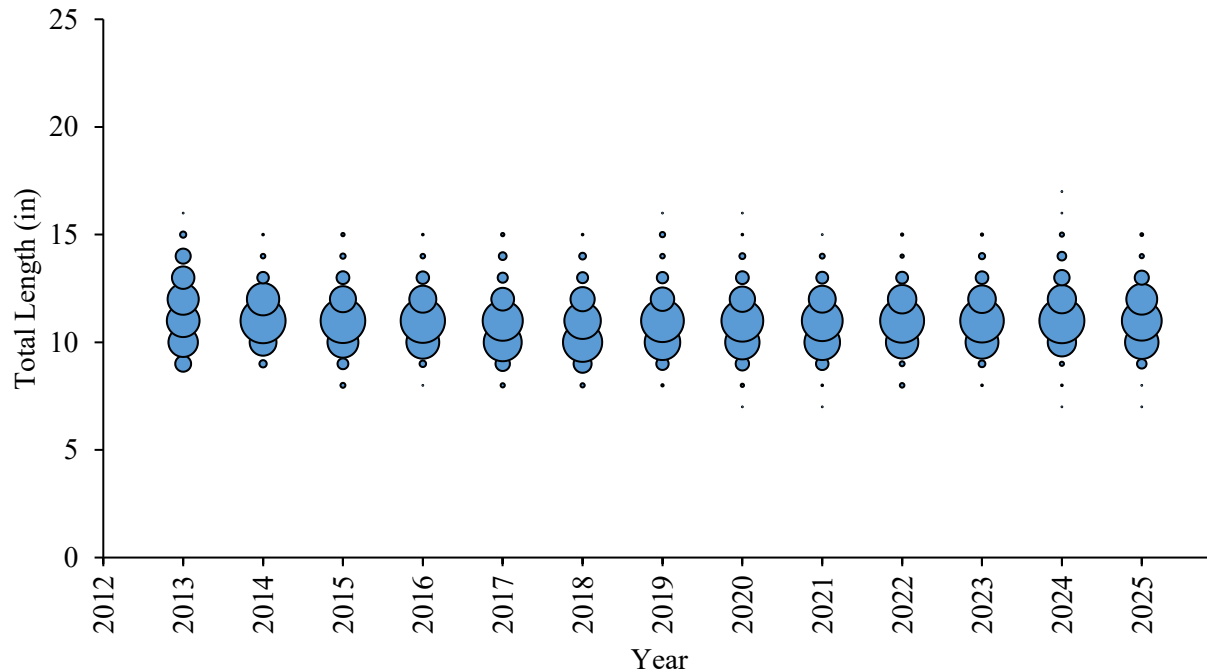


Figure 4. Commercial length frequency of kingfishes harvested, 2004–2025. Bubbles represent fish at length and the bubble size is proportional to the number of fish at that length.

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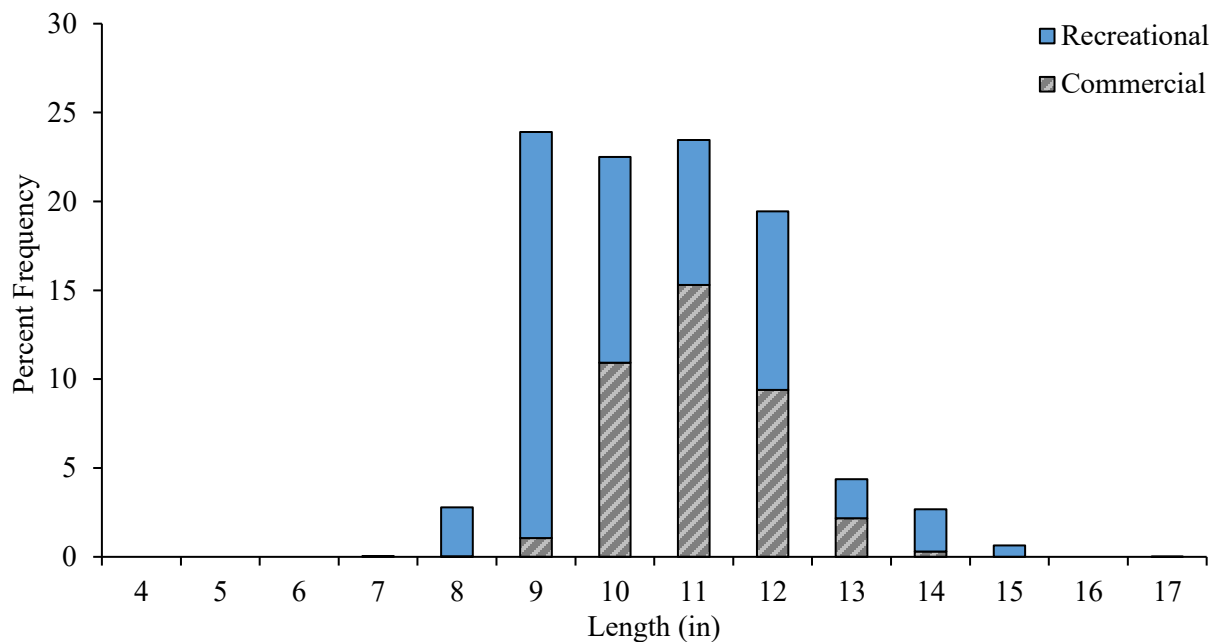


Figure 5. Commercial and recreational length frequency distribution of kingfishes harvested in 2025.

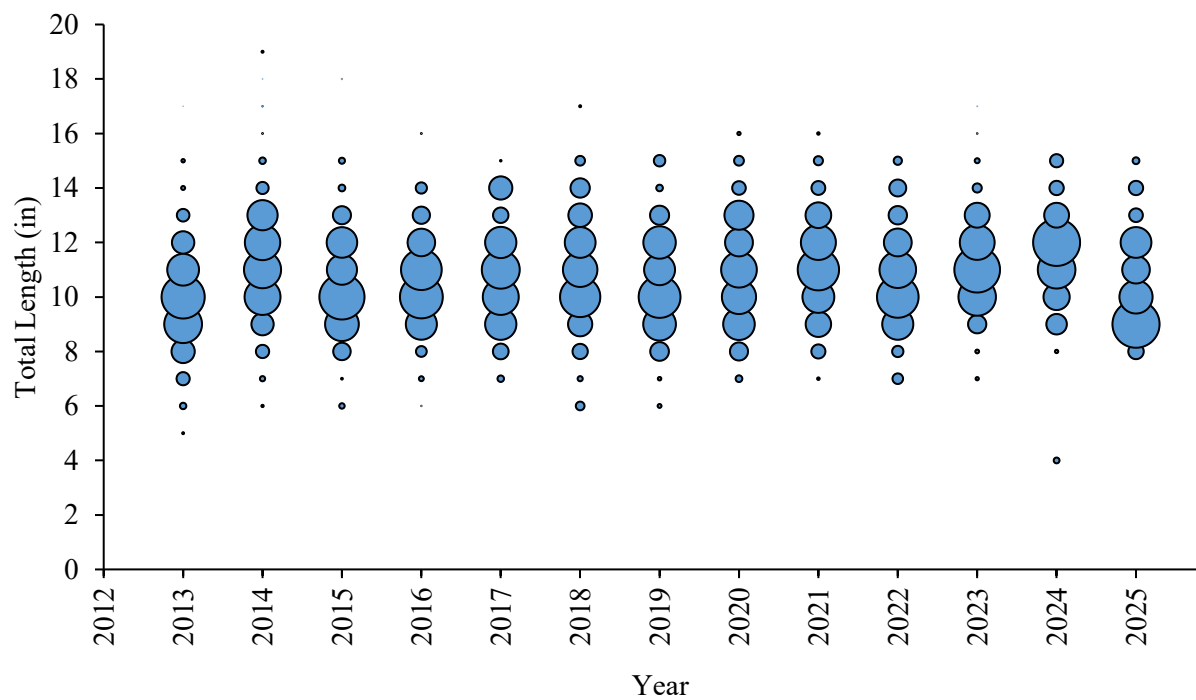


Figure 6. Recreational length frequency of kingfishes harvested, 2004–2025. Bubbles represent fish at length and the bubble size is proportional to the number of fish at that length.

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Table 2. Summary of length data (TL, in) sampled from kingfishes in the commercial fishery, 2013–2025.

Southern Kingfish				
Year	Mean Length	Minimum Length	Maximum Length	Total Number Measured
2013	12.0	6.5	16.1	1,357
2014	11.8	8.3	20.9	2,831
2015	11.7	7.7	15.8	3,276
2016	11.9	7.1	17.2	3,095
2017	11.4	7.9	16.1	2,486
2018	11.3	6.8	16.1	1,254
2019	11.4	8.0	24.8	4,342
2020	11.4	7.8	20.0	2,086
2021	11.4	7.5	16.0	2,485
2022	11.6	7.9	17.9	2,516
2023	11.7	7.9	20.7	1,950
2024	11.6	7.5	15.6	1,763
2025	11.4	7.9	17.2	1,747
Northern Kingfish				
Year	Mean Length	Minimum Length	Maximum Length	Total Number Measured
2013	13.2	8.6	16.0	754
2014	13.3	10.9	16.7	155
2015	12.7	10.0	16.6	84
2016	12.4	8.8	17.0	213
2017	13.4	10.0	17.4	165
2018	14.1	12.4	17.7	56
2019	12.1	8.1	16.1	148
2020	13.5	10.0	18.6	175
2021	13.5	9.9	18.4	153
2022	13.2	10.6	18.0	29
2023	12.9	10.8	15.6	69
2024	13.5	11.2	17.5	80
2025	13.0	10.3	17.6	41
Gulf Kingfish				
Year	Mean Length	Minimum Length	Maximum Length	Total Number Measured
2013	12.9	9.7	17.4	469
2014	12.2	9.2	15.5	181
2015	12.8	10.6	16.3	161
2016	12.4	8.1	18.3	192
2017	12.3	9.4	16.7	256
2018	12.5	9.0	18.0	160
2019	12.0	8.9	16.9	154
2020	12.8	9.3	17.0	130
2021	12.7	6.4	16.8	138
2022	12.5	10.5	16.1	80
2023	12.8	8.6	17.1	152
2024	12.2	10.6	14.3	36
2025	12.8	8.2	15.5	48

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Table 3. Summary of length data (TL, in) sampled from all kingfishes in the recreational fishery, 2013–2025. All kingfish species, Southern, Northern, and Gulf are combined to reduce Percent Standard Errors (PSE),

All Kingfishes				
Year	Mean Length	Minimum Length	Maximum Length	Total Number of Interviews
2013	9.9	5	17	1,098
2014	11.1	6	19	1,027
2015	10.4	6	18	728
2016	10.6	6	16	946
2017	10.8	7	15	898
2018	10.9	6	17	600
2019	10.6	6	15	671
2020	10.9	7	16	882
2021	11.1	7	16	950
2022	10.7	7	15	697
2023	11.1	7	17	682
2024	11.5	4	15	255
2025	10.2	4	15	388

Fishery-Independent Monitoring

Fishery-independent data are collected through the NCDMF Pamlico Sound Survey (Program 195), the Southeast Area Monitoring and Assessment Program-South Atlantic (SEAMAP-SA) Coastal Trawl Survey and the NCDMF Independent Gill Net Survey (Program 915).

Pamlico Sound Survey

The Pamlico Sound Survey caught the most kingfishes of the NCDMF fishery independent sampling programs, and the majority of those are Southern Kingfish. This survey ran uninterrupted since 1987. From 1991 to 2024, the Pamlico Sound Survey was conducted during the middle 2 weeks in June and September. The stations sampled were randomly selected from strata based upon depth and geographic location. The sample area covered all of Pamlico Sound, Croatan Sound up to the Highway 64 Bridge, the Pamlico River up to Blounts Bay, the Pungo River up to Smith Creek, and the Neuse River up to Upper Broad Creek. However, since most kingfishes were caught in Pamlico Sound, only those stations are used for the associated triggers. After 2024, the Pamlico Sound survey came to an end when the vessel used for the survey was retired.

The June portion of the Pamlico Sound Survey was used to calculate an annual maturity index tracking the proportion of adults larger than the length at which 50% of the adult population is sexually mature (L50, Southern Kingfish = 8.25 in TL). This index has been variable throughout the time series; however, Southern Kingfish abundance generally increased through 2003, then entered a more stable lower period from 2004 through 2019 (Table 4; Figure 7). During 2020 and 2021, sampling was impacted during June due to the COVID-19 pandemic. All stations were not sampled as only day trips were permitted. In June 2020, 15 of the 41 stations used in the L50 index were sampled, and in June 2021, 22 of the 41 stations used in the L50 index were sampled. Thus, the L50 indices may not be representative of the population and were not included for those years. In 2022, the L50 index abundance was the highest on record (0.79) since 2003, decreased in 2023 to 0.48, then increased again in 2024 to 0.73 (Table 4; Figure 7).

The September portion of the Pamlico Sound Survey is used to calculate an annual YOY index of relative abundance because YOY Southern Kingfish are more abundant in the fall. Similar to the L50 abundance index, the YOY relative abundance in 2020 and 2021 is not included due to the COVID-19 pandemic impacting sampling. The Pamlico Sound Survey YOY relative abundance index peaked in 2009, was on a

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decreasing trend through 2016, and has remained low since then, dropping significantly in 2024 (Table 4; Figure 8).

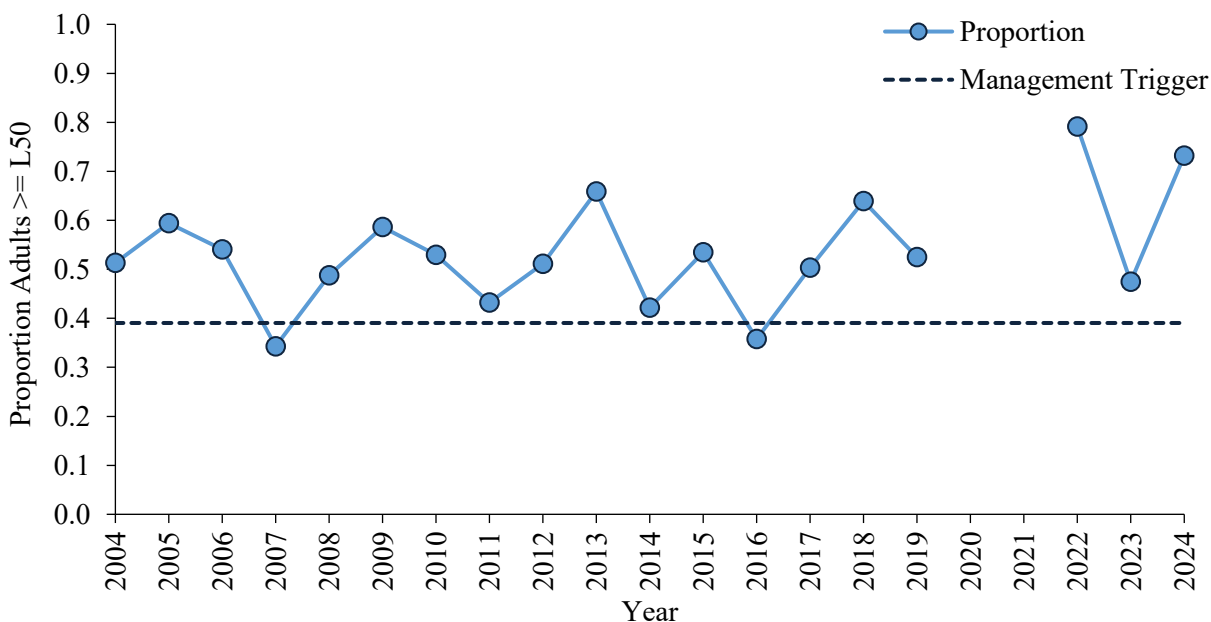


Figure 7. Annual proportion of adults (Southern Kingfish) greater than or equal to the length at 50% maturity occurring in the June component of the NCDMF Program 195 survey (excluding strata from the Neuse, Pamlico, and Pungo rivers), 2004–2024. The dotted line represents $\frac{2}{3}$ of the average of the base years, 1987–2017. Data for 2020 and 2021 are not included due to incomplete sampling in those years.

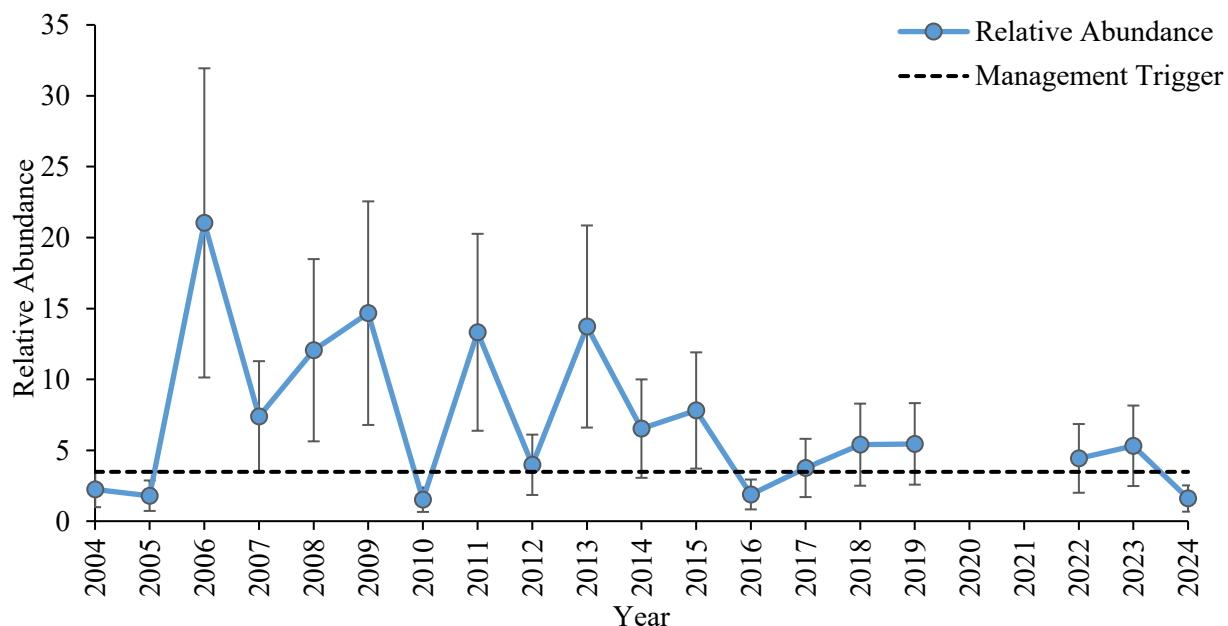


Figure 8. Annual index of relative YOY abundance for Southern Kingfish derived from the September component of the NCDMF Program 195 survey (excluding strata from the Neuse, Pamlico, and Pungo rivers), 2004–2024. The dotted line represents $\frac{2}{3}$ of the average of the base years, 1987–2017. Data for 2020 and 2021 are not included due to incomplete sampling in those years.

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Table 4. Summary of management triggers organized by category. Bold values indicate years a trigger was activated. Asterisks indicate years where a trigger could not be calculated due to data availability.

Year	Biological Monitoring			Fisheries-Independent Surveys			Other
	Proportion of Adults $\geq$ L50			YOY Indices		Adult Index	Relative <i>F</i>
	Program 195 Jun	Program 915 Jul–Sept	SEAMAP Summer	Program 195 Sep	SEAMAP Fall	SEAMAP Summer	
2012	0.51	1.00	0.37	3.98	25.53	89.92	12,832
2013	0.66	0.95	0.56	13.73	35.11	53.40	21,546
2014	0.42	0.98	0.54	6.53	32.28	45.75	57,408
2015	0.53	0.98	0.56	7.81	587.30	43.50	25,003
2016	0.36	0.95	0.35	1.88	60.27	40.79	7,324
2017	0.50	0.96	0.68	3.75	47.58	18.21	5,066
2018	0.64	1.00	0.40	5.39	15.82	19.97	12,078
2019	0.53	0.97	0.45	5.45	26.77	61.52	15,199
2020	*	*	*	*	*	*	*
2021	*	1.00	*	*	85.96	*	*
2022	0.79	1.00	0.77	4.43	33.36	31.75	40,604
2023	0.48	1.00	0.73	5.31	3.07	28.49	212,067
2024	0.73	0.98	0.75	1.60	1.12	27.71	2,456,504
2025	*	1.00	0.45	*	37.77	31.60	8,231
Threshold	<0.39	<0.65	<0.39	<3.48	<33.81	<17.57	>61,347
Total Years	36	24	35	36	36	35	34
Years Trigger Activated	3	0	5	14	21	3	9

SEAMAP-SA Coastal Trawl Survey

The Southeast Area Monitoring and Assessment Program-South Atlantic (SEAMAP-SA) Coastal Trawl Survey is conducted by the South Carolina Department of Natural Resources-Marine Resources Division and provides long-term fishery independent data on the distribution and relative abundance of coastal species (Cowen and Zimney 2016). Historically, SEAMAP-SA Coastal Trawl Survey cruises were conducted each year in spring (April to the end of May), summer (mid-July to mid-August), and fall (September to mid-November). Beginning in 2023, sampling for the survey is conducted during spring/summer (April–June) and summer/fall (August–October). In 2024, the survey transitioned to a new vessel, which necessitated the use of a smaller trawl net. The change also imposed constraints on the timing and geographic scope of the survey. The spring (April–June) portion of the SEAMAP-SA Coastal Trawl Survey is used to calculate a relative *F* index. The summer (July–August) portion of SEAMAP-SA Coastal Trawl Survey is used to calculate an annual adult index of abundance as well as an annual maturity index. The fall (September–November) portion of SEAMAP-SA Coastal Trawl Survey is used to calculate an annual YOY index of abundance. After a peak in 2012, the SEAMAP-SA Coastal Trawl Survey adult index of relative abundance has been on a declining trend, which continued until 2017, peaking again in 2019 and then declining in 2022, 2023, 2024, and 2025 (Table 4; Figure 9). The YOY index of relative abundance increased to well above the average in 2015 then dropped well below the average in 2023 and 2024 and now has increased again in 2025 (Table 4; Figure 10). The L50 index has fluctuated throughout the time series, ranging from 0.28 to 0.93, but was well above the average in 2022, 2023, and 2024 before dropping below again in 2025 (Table 4; Figure 11). Relative *F* has been relatively stable with a peak in 2014 and sharp increase starting in 2023 before reaching the maximum level in the time-series in 2024, then

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decreasing sharply again in 2025 (Table 4; Figure 12). The survey did not occur in 2020 or in spring and summer of 2021, due to the COVID-19 pandemic.

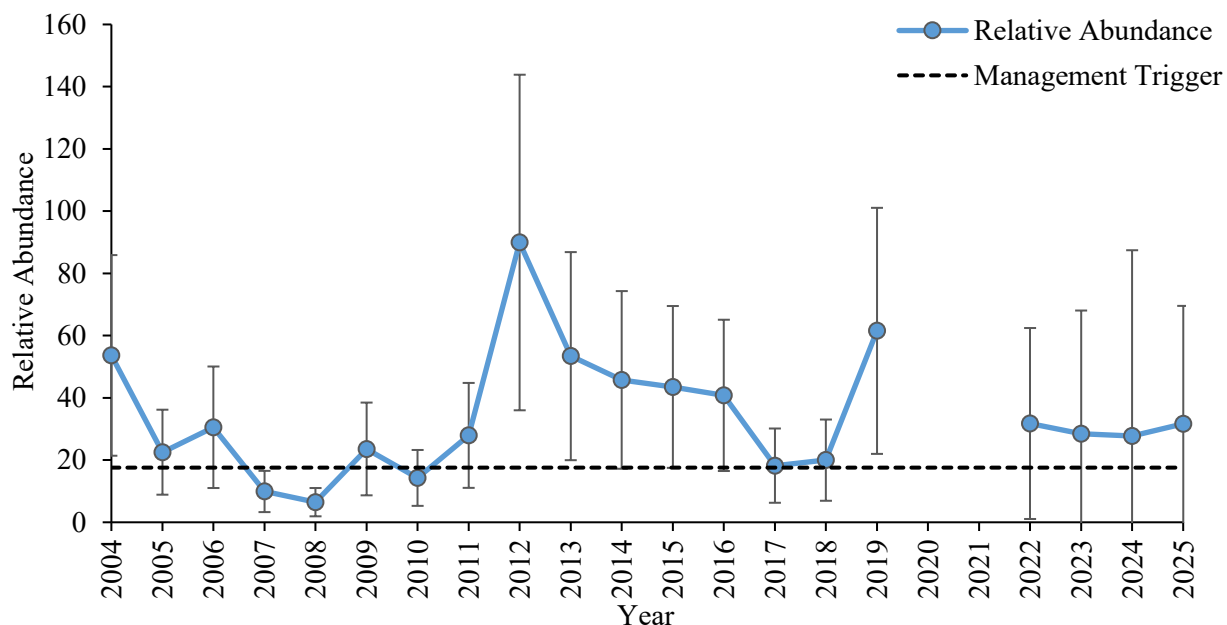


Figure 9. Annual index of relative adult abundance for Southern Kingfish derived from the summer component of the SEAMAP-SA Coastal Trawl Survey (Onslow, Raleigh, and Long bays, inner—shallow—strata), 2004–2025. The summer component of the survey was not conducted in 2020 or 2021. The dotted line represents $\frac{2}{3}$ of the average of the base years, 1989–2017.

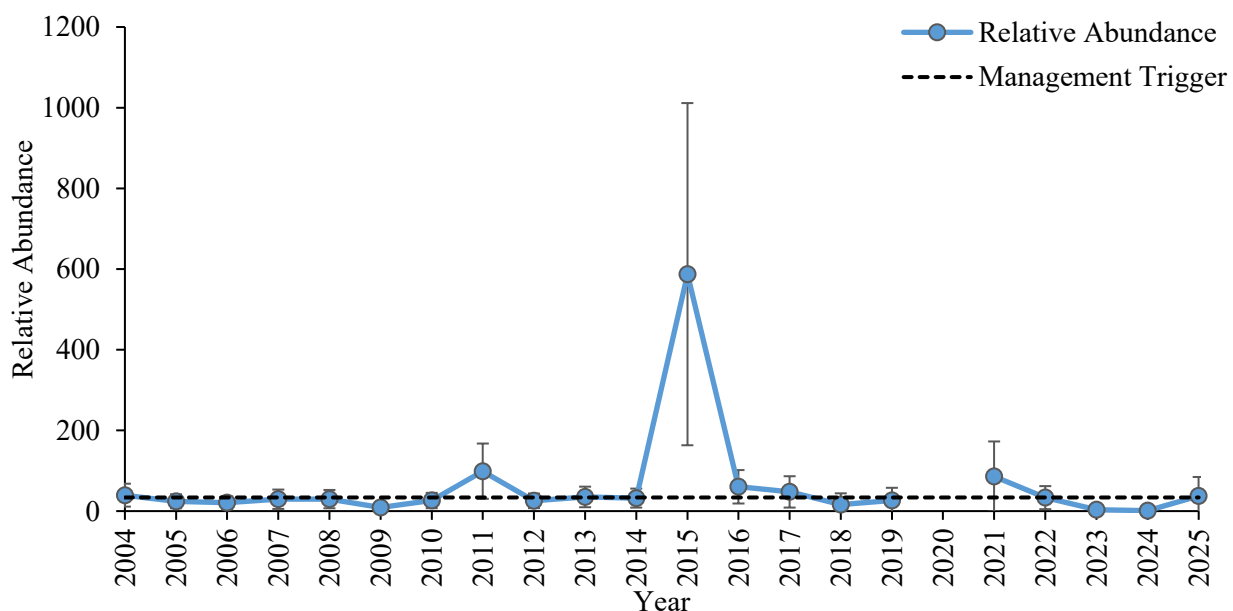


Figure 10. Annual index of relative YOY abundance for Southern Kingfish derived from the fall component of the SEAMAP-SA Coastal Trawl Survey (Onslow, Raleigh, and Long bays, inner—shallow—strata), 2004–2025. The fall component of the survey was not conducted in 2020. The dotted line represents $\frac{2}{3}$ of the average of the base years, 1989–2017.

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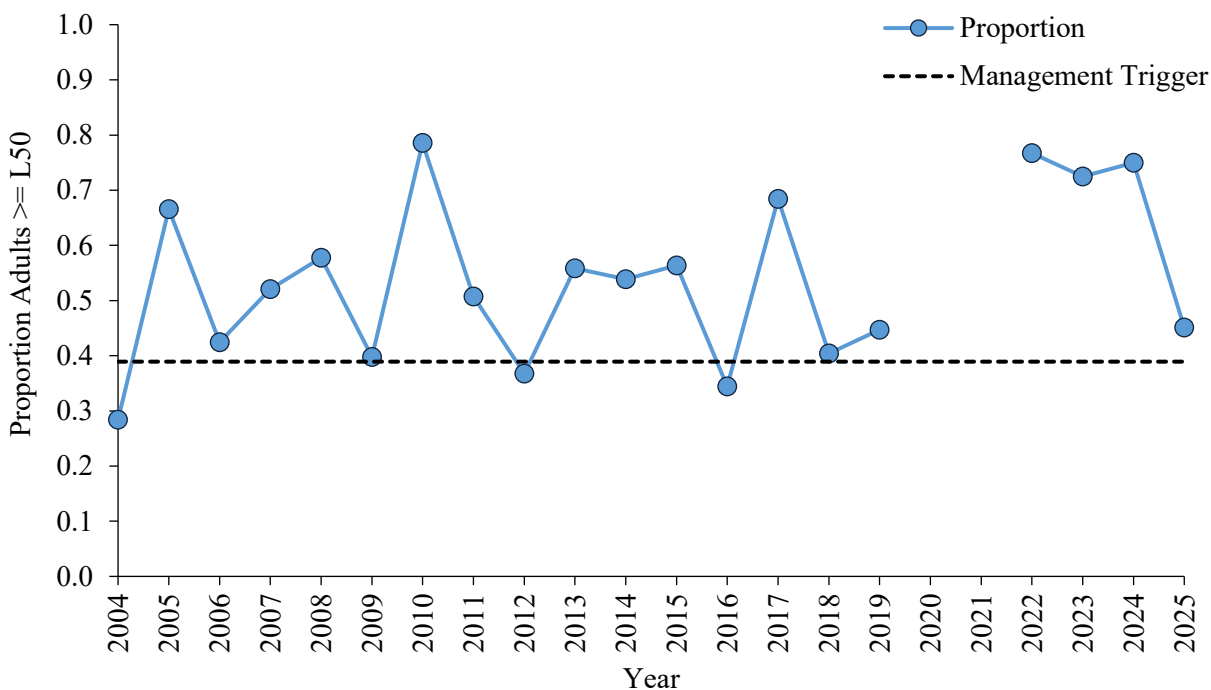


Figure 11. Annual proportion of adults (Southern Kingfish) greater than or equal to the length at 50% maturity occurring in the summer component of the SEAMAP-SA Coastal Trawl Survey (Onslow, Raleigh, and Long bays, inner—shallow—strata), 2004–2025. The summer component of the survey was not conducted in 2020 or 2021. The dotted line represents $\frac{2}{3}$ of the average of the base years, 1989–2017.

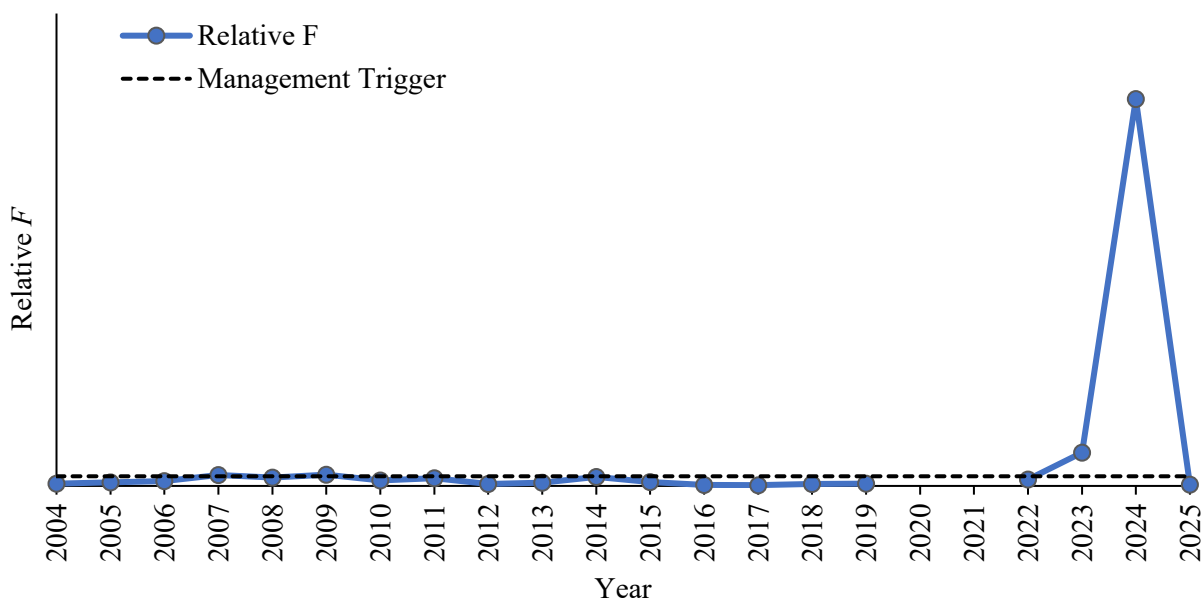


Figure 12. Relative F , as estimated as harvest (commercial and recreational) divided by the SEAMAP-SA Coastal Trawl Survey spring index (Onslow, Raleigh, and Long bays, inner—shallow—strata) of relative abundance for Southern Kingfish, 1990–2025. The spring component of the survey was not conducted in 2020 or 2021. The dotted line represents the average plus $\frac{1}{3}$ of the average of the base years, 1990–2017.

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Independent Gill Net Survey

The Independent Gill Net Survey (Program 915) is designed to characterize the size and age distribution for key estuarine species in Pamlico Sound and its major river tributaries. The Program 915 maturity index management trigger is based on a conservative proportion of adults in the population from July through September. During 2020, no maturity index was available for Southern Kingfish from the Independent Gill Net Survey (Program 915). Sampling in Program 915 was suspended in February 2020 due to COVID-19 restrictions and protected species interactions, so no 2020 maturity index was available from this program. Program 915 sampling resumed in July 2021. The L50 index has been stable over the time series, ranging from 0.947 to 1.00, and has never fallen below the management trigger threshold (Figure 13).

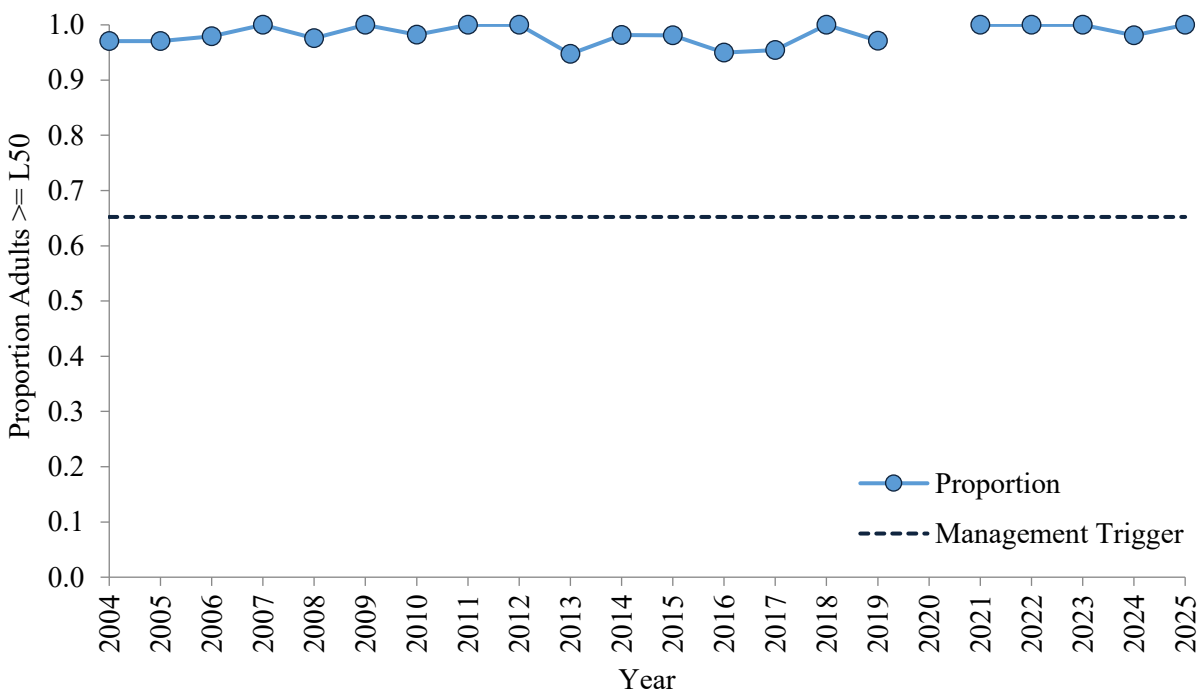


Figure 13. Annual proportion of adults (Southern Kingfish) greater than or equal to the length at 50% maturity occurring in the July through September component of the NCDMF Program 915 survey (Pamlico Sound, deep strata only), 2004–2025. The dotted line represents $\frac{2}{3}$ of the average of the base years, 2001–2017. Data for 2020 and 2021 are not included due to incomplete sampling in those years.

Table 5 summarizes the age data for kingfishes (Southern, Northern, and Gulf), collected from 2013 through 2025. The majority of kingfishes age samples came from Independent Gill Net Survey (Program 915), followed by the commercial ocean gill net fishery. Southern Kingfish ages ranged from 0 to 8 years old (Figure 14). The length at age for all Southern Kingfish samples are presented in Figure 14. Northern Kingfish ages ranged from 0 to 9 years old. Gulf Kingfish ages ranged from 0 to 9 years old. The modal age has ranged from 0 to 5 years for Southern, Gulf, and Northern kingfishes (Table 5).

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Table 5. Kingfishes age data collected from all sources (commercial and recreational fisheries and fishery independent sampling programs) combined, 2013–2024.

Southern Kingfish				
Year	Modal Age	Minimum Age	Maximum Age	Total Number Aged
2013	2	1	5	290
2014	3	0	6	263
2015	1	0	6	339
2016	1	0	7	531
2017	2	0	6	413
2018	1	0	7	303
2019	2	1	7	385
2020	2	0	7	242
2021	3	1	6	398
2022	3	1	7	514
2023	3	0	7	650
2024	2	0	7	778
2025	3	0	8	475
Northern Kingfish				
Year	Modal Age	Minimum Age	Maximum Age	Total Number Aged
2013	2	1	4	25
2014	3	3	3	1
2015	0	0	2	27
2016	1	1	4	49
2017	2	1	3	13
2018	3	3	3	1
2019				0
2020	5	1	7	5
2021	3	1	5	9
2022	2	1	4	29
2023	3	1	5	18
2024	2	1	9	17
2025	3	1	3	8
Gulf Kingfish				
Year	Modal Age	Minimum Age	Maximum Age	Total Number Aged
2013	1	1	4	39
2014	3	1	4	36
2015	1	1	6	62
2016	1	0	5	116
2017	2	0	5	168
2018	2	0	6	98
2019	1	0	6	183
2020	2	0	5	163
2021	2	0	7	205
2022	3	1	7	298
2023	2	0	6	156
2024	2	1	7	208
2025	2	0	9	195

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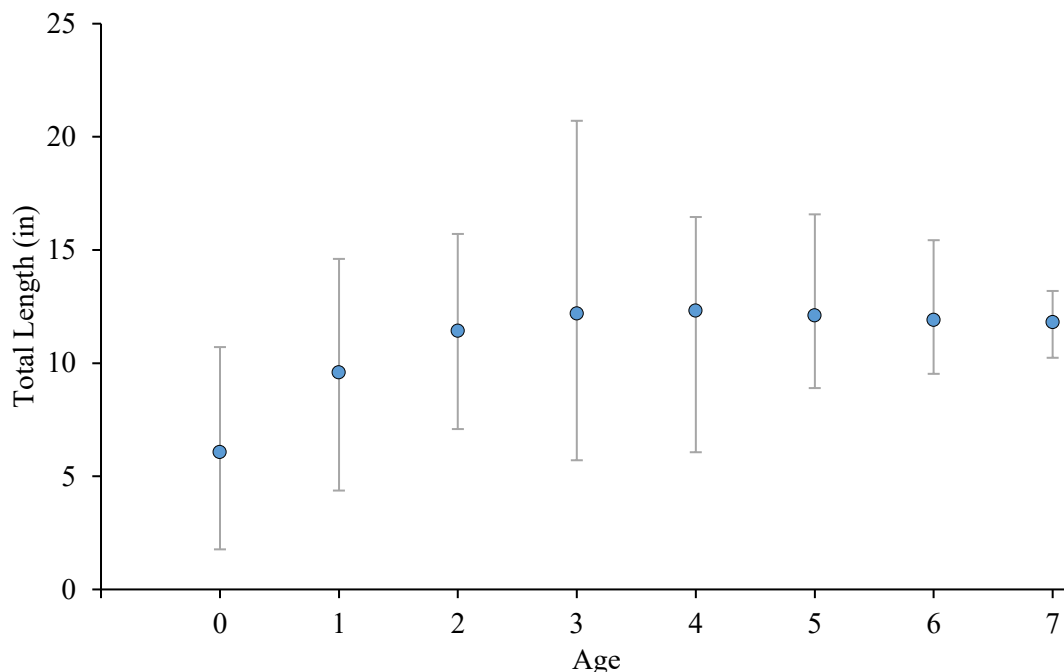


Figure 14. Southern Kingfish length at age based on all samples collected, 1997–2025. Blue circles represent the mean size at a given age while the grey horizontal lines represent the minimum and maximum length observed for each age.

RESEARCH NEEDS

The division reviewed and prioritized the research recommendations during the 2015 FMP Information Update (NCDMF 2015). The prioritization of each research recommendation is designated as a high, medium, or low priority. A low ranking does not infer a lack of importance but is either already being addressed by others or provides limited information for aiding in management decisions. A high ranking indicates there is a substantial need, which may be time sensitive in nature, to provide information to help with management decisions. Completion of these research recommendations will provide for increased understandings of the kingfish stock status and improved management:

High

- Sex-specific length at age data from all sources: commercial, recreational, and fisheries independent
- A fisheries independent program led by DMF to calculate an index of relative abundance for kingfishes
- Length composition data from the NEAMAP and SEAMAP programs
- Develop a tagging study to estimate natural and fishing mortality, to investigate stock structure, and to understand movement patterns
- Continue data collection from the Pamlico sound survey

Medium

- Beach/nearshore ocean fishery independent sampling
- Development of biphasic growth models for the complex
- Conduct a study to identify spawning areas with priority for Southern Kingfish
- Improve fishery-dependent commercial data collection specific to the Shrimp Trawl fishery

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Low

- Determine the effects of beach re-nourishment on kingfishes and their prey

MANAGEMENT

The 2007 Kingfish FMP selected the use of trend analysis and management triggers as the management strategy to monitor the viability of the Southern Kingfish stock in North Carolina (NCDMF 2007; Table 6). A second management strategy promotes work to enhance public information and education. The trend analysis and management triggers are updated annually, and results are presented to the NCMFC as part of the annual FMP Update. The trend analysis incorporates triggers to alert managers to the potential need for management action based on stock conditions. The activation of any two management triggers 2 years in a row (regardless of category) warrants further data evaluation and potential management action. The NCMFC will be notified should this criterion be met. Southern Kingfish is designated as the indicator species for this assemblage. The Pamlico Sound Survey, the Independent Gill Net Survey and the SEAMAP-SA Coastal Trawl Survey data are currently used for management triggers for kingfishes in North Carolina.

Table 6. Summary of the N.C. Marine Fisheries Commission management strategies and their implementation status for the 2007 Kingfish Fishery Management Plan.

Management Strategy	Implementation Status
<i>Fisheries Management</i>	
The proposed management strategy for kingfishes in North Carolina is to 1) maintain a sustainable harvest of kingfishes over the long-term and 2) promote public education. The first strategy will be accomplished by developing management triggers based on the biology of kingfishes, landings of kingfishes, independent surveys, and requesting a stock assessment of kingfishes be conducted by Atlantic States Marine Fisheries Commission (ASMFC). The second strategy will be accomplished by the NCDMF working to enhance public information and education.	Accomplished
Recommend ASMFC conduct a coastwide stock assessment on sea mullet.	ASMFC determined a stock assessment for the kingfishes was not necessary due to the positive trends in SEAMAP Southern Kingfish CPUE.
Endorse additional research to reduce bycatch in the shrimp trawl fishery, primarily shrimp trawl characterization studies involving at-sea observers and investigations into fish excluder devices with a higher success rate for reducing the harvest and retention of kingfish in shrimp trawls.	Accomplished
Implement rule giving NCDMF director proclamation authority to manage Kingfish.	Accomplished. Rule 15A NCAC 3M .0518 in effect since Oct 1, 2008
<i>Habitat and Water Quality</i>	
The NCDMF should continue promoting the use of shoreline stabilization alternatives that maintain or enhance fish habitat. That includes using oyster cultch or limestone marl in constructing the sills (granite sills do not attract oyster larvae).	Endorsed through the Coastal Habitat Protection Plan (CHPP)
To ensure protection of kingfish nursery areas, fish-friendly alternatives to vertical stabilization should be required around primary and secondary nursery areas.	Endorsed through the CHPP

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Management Strategy	Implementation Status
The location and designation of nursery habitats should be continued and expanded by the NCDMF.	Endorsed through the CHPP
No trawl areas and mechanical harvest prohibited areas should be expanded to include recovery/restoration areas for subtidal oyster beds and SAV.	Endorsed through the CHPP
Expansion and coordination of habitat monitoring efforts is needed to acquire data for modeling the location of potential recovery/restoration sites for oysters and SAV.	Endorsed through the CHPP
Any proposed stabilization project threatening the passage of kingfish larvae through coastal inlets should be avoided.	Endorsed through the CHPP
All coastal-draining river basins should be considered for NSW classification because they all deliver excess nutrients to coastal waters, regardless of flushing rate.	Endorsed through the CHPP
Efforts to implement phase II stormwater rules must be continued.	Endorsed through the CHPP
The EEP process should be extended to other development projects.	Endorsed through the CHPP
Reduce sediment and nutrient loading by addressing multiple sources, including:	Endorsed through the CHPP
• improvement and continuation of urban and agricultural BMPs, • more stringent sediment controls on construction projects, and • implementation of additional buffers along coastal waters.	

The L50 management triggers are based on the conservative proportion of adults in the population. This is the length at which 50% of the population is mature. For Southern Kingfish, this is 8.25 in (210 mm) in TL. Data sources for these management triggers come from three fisheries-independent surveys: the summer component of the SEAMAP-SA Coastal Trawl Survey, the July–September component of Independent Gill Net Survey, and the June component of the Pamlico Sound Survey.

Relative F is a simple method for estimating trends in fishing mortality (Sinclair 1998). It is estimated as harvest (commercial landings plus recreational harvest) divided by a fisheries-independent index of relative abundance. Here, harvest (commercial landings plus recreational harvest) was divided by the SEAMAP-SA Coastal Trawl Survey spring index (Onslow, Raleigh, and Long bays; inner-shallow-strata) of relative abundance, given the majority of harvest occurs in the spring.

The Southern Kingfish management triggers are summarized as follows:

Biological Monitoring

Proportion of adults $\geq$ length at 50% maturity (L50) for NCDMF Program 195 June (Figure 7)

Proportion of adults $\geq$ L50 for NCDMF Program 915 July–September (Figure 13)

Proportion of adults $\geq$ L50 for SEAMAP-SA Coastal Trawl Survey summer (Figure 11)

- If the proportion of adults $\geq$ L50 falls below $\frac{2}{3}$ of the average proportion of adults $\geq$ L50 for the base years (through 2017), then the trigger will be considered tripped.

Fisheries-Independent Surveys-Juvenile and Adult

NCDMF Program 195 September index of YOY relative abundance (Figure 8)

SEAMAP-SA Coastal Trawl Survey summer index of adult relative abundance (Figure 9)

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SEAMAP-SA Coastal Trawl Survey fall index of YOY relative abundance (Figure 10)

- If a fisheries-independent survey falls below $\frac{2}{3}$ of the average abundance for the base years (through 2017), then the trigger will be considered tripped.

Other

Relative fishing mortality rate (F) (Figure 12)

- If relative F rises above the average $+\frac{1}{3}$ of relative F for the base years (through 2017), the trigger will be considered tripped.

A summary of the management triggers by year is provided in Table 4. Bold values indicate years when a particular management trigger was activated. For 2020, none of the seven triggers were able to be updated with 2020 data due to impacts from the COVID-19 pandemic. For 2021, only two of the seven triggers were able to be updated with 2021 data due to impacts from the COVID-19 pandemic and staffing issues with the division's survey vessel. Neither of the two updated triggers were activated in 2021. For 2022, all seven triggers were able to be updated, with one management trigger activated (the adult index from the summer SEAMAP-SA Coastal Trawl Survey). For 2023, all seven triggers were able to be updated, and three management triggers were activated (the YOY index from the fall SEAMAP-SA Coastal Trawl Survey, the adult index from the summer SEAMAP-SA Coastal Trawl Survey, and relative F). For 2024, all seven triggers were able to be updated, and four management triggers were activated (the YOY index from the fall portion of P195 [Pamlico Sound Survey], the YOY index from the fall SEAMAP-SA Coastal Trawl Survey, the adult index from the summer SEAMAP-SA Coastal Trawl Survey, and relative F). Two or more triggers were activated for two consecutive years, but it is important to consider that the data used to inform all three out of four triggers activated in 2024 were from the SEAMAP-SA Coastal Trawl Survey. Recent spatial and temporal adjustments in the sampling design for the SEAMAP-SA Coastal Trawl Survey likely impacted the 2024 Southern Kingfish indices of relative abundance, including the spring portion used to calculate relative F . Specifically, in 2024 sampling only occurred in the months June, August, and September, greatly limiting the data available for each season. Similar issues occurred in 2023, with all three triggers of concern based on data from the SEAMAP-SA Coastal Trawl Survey. Sampling was again limited in both time and space, with only 1 month of sampling in summer and fall, respectively, and one of the three regions where kingfishes are typically found was not sampled. For 2025, five of the seven triggers were updated, the two Pamlico sound survey triggers can no longer be updated. No triggers exceeded their thresholds. In 2025, the SEAMAP-SA Coastal Trawl Survey sampled during April, May, August, and September. While the fall portion occurred when kingfish abundance isn't usually the highest, the YOY index did not fall below the threshold. The spring portion of the survey occurred during time where kingfish abundance is highest, the relative F trigger calculated from the Spring abundance index, fell below the threshold.

MANAGEMENT PERFORMANCE AND FISHERY MANAGEMENT PLAN SCHEDULE RECOMMENDATIONS

Management strategies continue to be maintained as outlined in the State FMP. Stock conditions are monitored via management triggers and reported through the annual FMP Review. The Kingfishes FMP prescribes that if two or more triggers are activated in two consecutive years then data will be evaluated further and the need for management changes will be considered. While three management triggers were activated for two consecutive years in 2023 and 2024, survey changes likely affected indices of Southern Kingfish relative abundance. Additionally, trigger analysis in 2025 indicated none of the triggers activated. Scheduled review of the plan began in 2025 and includes a comprehensive review of available data and reevaluation of management triggers, prior to assessing the need for management changes.

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LITERATURE CITED

- Cowen, J. and A.B. Zimney. 2016. Results of Trawling Efforts in the Coastal Habitat of the South Atlantic Bight, 2015. South Carolina Department of Natural Resources. Marine Resources Division. Charleston, South Carolina. 104 pp.
- NCDMF (North Carolina Division of Marine Fisheries). 2007. North Carolina Kingfishes Fishery Management Plan. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, North Carolina. 235 pp.
- NCDMF. 2015. North Carolina Kingfishes Fishery Management Plan Information Update. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, North Carolina. 196 pp.
- Sinclair, A.F. 1998. Estimating trends in fishing mortality at age and length directly from research survey and commercial catch data. *Canadian Journal of Fisheries and Aquatic Sciences*. 55(5):1248–1263.