# FISHERY MANAGEMENT PLAN UPDATE
# RED DRUM
# AUGUST 2025

## STATUS OF THE FISHERY MANAGEMENT PLAN

### Fishery Management Plan History

| | | |
|---|---|---|
| Original FMP Adoption: | March 2001 | |
| Amendments: | Amendment 1 | November 2008 |
| Revisions: | None | |
| Supplements: | None | |
| Information Updates: | 2024 | |
| Schedule Changes: | None | |
| Comprehensive Review: | 2025 | |

Red drum (*Sciaenops ocellatus*) in North Carolina are currently managed under Amendment 1 to the North Carolina Red Drum Fishery Management Plan (FMP; NCDMF 2008). When Amendment 1 was developed, the 2007 stock assessment indicated overfishing was not occurring in North Carolina (Takade and Paramore 2007). As a result, no new harvest restrictions for either the commercial or recreational fisheries were required when this amendment was adopted in 2008. Amendment 1 did implement regulations requiring circle hooks along with fixed weights and short leaders in the summer adult red drum recreaitonal fishery in Pamlico Sound; and expanded gill net attendance requirements originally implemented as part of the 2001 North Carolina Red Drum FMP (NCDMF 2001) to reduce the impact of discard mortality.

Prior to Amendment 1, restrictive harvest measures due to overfishing were implemented through the 2001 North Carolina Red Drum FMP. These measures were first implemented in October of 1998, as interim measures, while the full plan was developed. Harvest restrictions included: restricting all harvest to fish between 18- and 27-inches total length (TL; previously allowed one fish over 27 inches TL); implemented a one fish recreational bag limit (previously a five fish bag limit); implemented a daily trip limit for the commercial fishery that is set by the North Carolina Division of Marine Fisheries (DMF) director (previously no daily limit); and maintained the existing 250,000-pound annual commercial cap. The trip limit was designed to reduce harvest and to deter targeting of red drum commercially. The original FMP also implemented seasonal small mesh gill net attendance requirements to reduce discard mortality of red drum. Final approval of the North Carolina Red Drum FMP occurred in March 2001 and interim measures implemented in October of 1998 were maintained. Stock assessments conducted since adoption of the 2001 FMP have all indicated management measures have been effective at preventing overfishing in the Northern stock (Takade and Paramore 2007; SAFMC 2009; ASMFC 2017; ASMFC 2024).

In addition to the state FMP, red drum in North Carolina fall under Amendment 2 to the Atlantic States Marine Fisheries Commission (ASMFC) Red Drum FMP (ASMFC 2002). Adopted in 2002, Amendment 2 required all states to implement management measures projected to result in a 40% static spawning potential ratio (sSPR). Each state was required to implement these measures no later than January 2003. Further, the plan also continues to require that states maintain management strategies that ensure overfishing is not occurring and that optimum yield (OY) in the red drum fishery can be obtained. Amendment 2 compliance requirements for the states include:

- Implementing bag and size limits projected by bag and size limit analysis to achieve the minimum 40% sSPR.
- Establishing a maximum size limit of 27 inches TL or less in all red drum fisheries.

- Maintaining current or more restrictive commercial fishery regulations.
- Requires any commercial cap overages from one fishing year to be subtracted from the subsequent year's commercial cap.

The management measures already in place through the 2001 North Carolina Red Drum FMP were deemed sufficient to meet all requirements when Amendment 2 to the ASMFC plan was passed. Since that time, the 2009, 2017 and 2024 assessments for red drum have indicated the current management strategy developed under Amendment 2 to the ASMFC plan have been sufficient to meet targets (SAFMC 2009; ASMFC 2017, ASMFC 2024).

To ensure compliance with interstate requirements, North Carolina also includes red drum as part of the North Carolina Fishery Management Plan for Interjurisdictional Fisheries (IJ FMP). The goal of the IJ FMP is to adopt fishery management plans, consistent with N.C. law, approved by the Mid-Atlantic Fishery Management Council, South Atlantic Fishery Management Council, or the ASMFC by reference and implement corresponding fishery regulations in North Carolina to provide compliance or compatibility with approved fishery management plans and amendments, now and in the future. The goal of these plans, established under the Magnuson-Stevens Fishery Conservation and Management Act (federal council plans) and the Atlantic Coastal Fisheries Cooperative Management Act (ASMFC plans) are like the goals of the Fisheries Reform Act of 1997 to "ensure long-term viability" of these fisheries (NCDMF 2022).

**Management Unit**

Amendment 1 to the North Carolina Red Drum FMP applies to all joint and coastal waters throughout North Carolina, while the interjurisdictional plan through ASMFC applies to all states from Florida to Maine. Under the ASMFC plan, the management unit for red drum along the Atlantic coast is divided into a northern and southern stock. North Carolina and all areas north along the Atlantic coast represent the northern stock.

**Goal and Objectives**

The goal of Amendment 1 to the North Carolina Red Drum FMP is to prevent overfishing in the red drum stocks by allowing the long-term sustainable harvest in the red drum fishery. To achieve this goal, the FMP lists the following objectives:

- Achieve and maintain a minimum overfishing threshold where the rate of juvenile escapement to the adult stock is sufficient to maintain the long-term sustainable harvest in the fishery.
- Establish a target spawning potential ratio to provide the optimum yield from the fishery in order to maintain a state FMP that is in compliance with the requirements of the ASMFC Red Drum FMP.
- Continue to develop an information program to educate the public and elevate their awareness of the causes and nature of problems in the red drum stock, its habitat and fisheries, and explain the rationale for management efforts to solve these problems.
- Develop regulations that while maintaining sustainable harvest from the fishery, consider the needs of all user groups and provides adequate resource protection.
- Promote harvest practices that minimize the mortality associated with regulatory discards of red drum.
- In a manner consistent with the Coastal Habitat Protection Plan, restore, improve and protect essential red drum habitat and environmental quality to increase growth, survival, and reproduction of red drum.
- Improve our understanding of red drum population dynamics and ecology through the continuation of current studies and the development of better data collection methods, as well as, through the identification and encouragement of new research.
- Initiate, enhance, and continue studies to collect and analyze the socio-economic data needed to properly monitor and manage the red drum fishery.

## DESCRIPTION OF THE STOCK

### Biological Profile

Red drum are estuarine dependent members of the drum family that includes Atlantic croaker, spot, black drum, weakfish, and spotted sea trout. Ranging from Florida to Massachusetts along the Atlantic coast, red drum are most abundant from Virginia to Florida. Red drum, also called channel bass or red fish, are common throughout the coastal waters of North Carolina and is designated as the state's official saltwater fish. Large red drum (up to 90 pounds) inhabit coastal waters throughout the year and are observed in the surf during the spring and fall seasons and are commonly found in the Pamlico Sound during the summer months. Spawning takes place in the fall around coastal inlets and in Pamlico Sound. Larval and juvenile red drum use various shallow estuarine habitats in coastal sounds and rivers during the first few years of life. Upon maturity (age 4 and around 32 inches in length), red drum move out of estuaries to join the adult spawning stock in the ocean. Red drum are a long-lived species commonly reaching ages in excess of 40 years. The oldest red drum recorded was taken in North Carolina and was 62 years old. Red drum are opportunistic feeders and diet can shift with changes in age and habitat. Various types of small crabs and shrimp make up a large portion of juvenile red drum diets; while crabs and shrimp continue to make up a portion of the adult diet, adults will also frequently eat various fish species.

### Stock Status

The 2017 benchmark stock assessment indicated the red drum Northern stock (including NC) was not experiencing overfishing (ASMFC 2017). The overfished status was undetermined due to uncertainty in the adult stock size estimates. A new benchmark assessment was completed in 2024 with data through terminal fishing year 2021. The assessment indicated the red drum Northern stock (including NC) was not overfished and overfishing is not occurring (ASMFC 2024).

### Stock Assessment

The threshold (below which the stock is experiencing overfishing) and the target fishing mortality rates correspond to those rates that achieve 30% and 40% static spawning potential ratio (SPR). Static spawning potential ratio is a measure of spawning stock biomass survival rates when fished at the current year's fishing mortality rate relative to the spawning stock biomass survival rates if no fishing mortality was occurring; more detailed methodologies are available in the full stock assessment report (ASMFC 2024). Based on results of the 2017 benchmark assessment, the static spawning potential ratio was at or above target levels (ASMFC 2017). The 2024 assessment showed divergent SPRs between the previous statistical catch-at-age model using calendar year and the new stock synthesis (SS) model using fishing year. Divergence was primarily in the beginning of the time series with the scale of the SPR estimates from the two models converging around 2010 (Figure 1). This early divergence highlights uncertainty with scale and initial condition estimates for the northern stock, which contributed to the decision not to use the northern SS model for stock status determination in this assessment (ASMFC 2024).

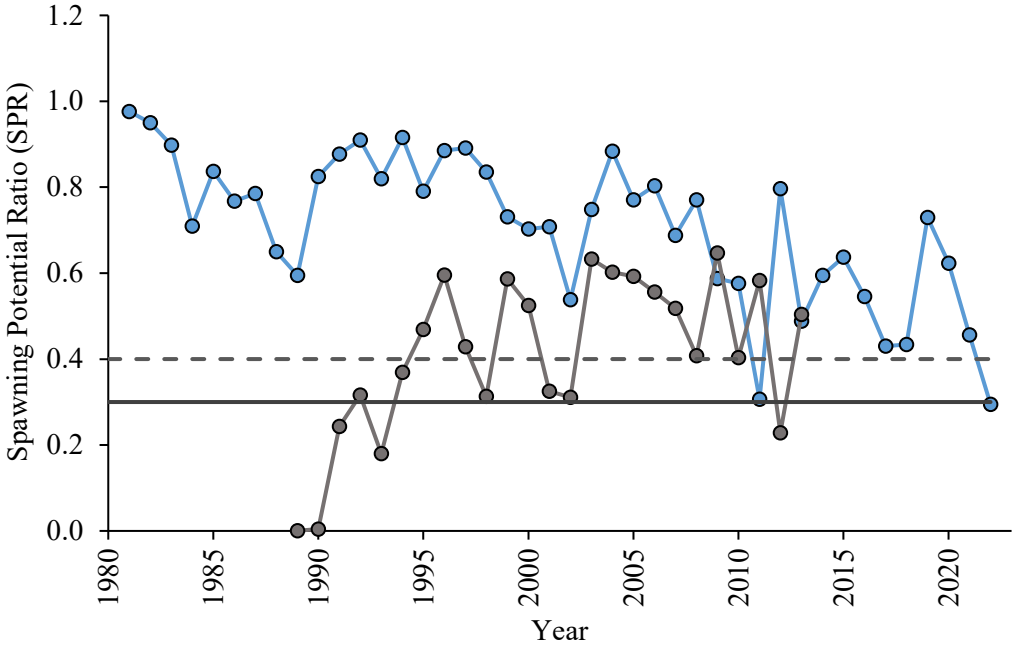


Figure 1. Northern region (including North Carolina) spawning potential ratio (SPR) estimates for the northern stock from the previous benchmark stock assessment using a custom statistical catch-at-age calendar year model (ASMFC 2017; gray) and the current benchmark assessment SS estimated selectivity fishing year model (blue; not approved for use in management of 2024 stock assessment).

For the northern stock, the traffic light analyses (TLA) is comparable to the SS model in making spawning stock biomass status determinations and outperforms SS when characterizing recruitment condition. A TLA approach can also be used during interim periods between formal assessments to update stock status for management advice.

The TLA framework used in the assessment was previously developed for the simulation assessment (ASMFC 2022). The TLA uses colors like that of a traffic light to represent the state of a fishery based on appropriate indicators (i.e., an index or time-series of relevant data). Three key characteristics were analyzed including recruitment, adult abundance, and fishery performance (Figure 2). Abundance and recruitment indicators were developed from fishery-independent surveys. Fishery performance was defined as the relative harvest fishing mortality which was calculated by dividing the harvest by an appropriate survey (same state or stock where the fleet is operating) derived index of slot-sized fish for each year. Stock status determinations are made from the TLA results according to the following scenarios: If fishery performance is red in any of the past three years, overfishing is occurring. If adult abundance is red in any of the past three years, the stock is overfished (ASMFC 2024).

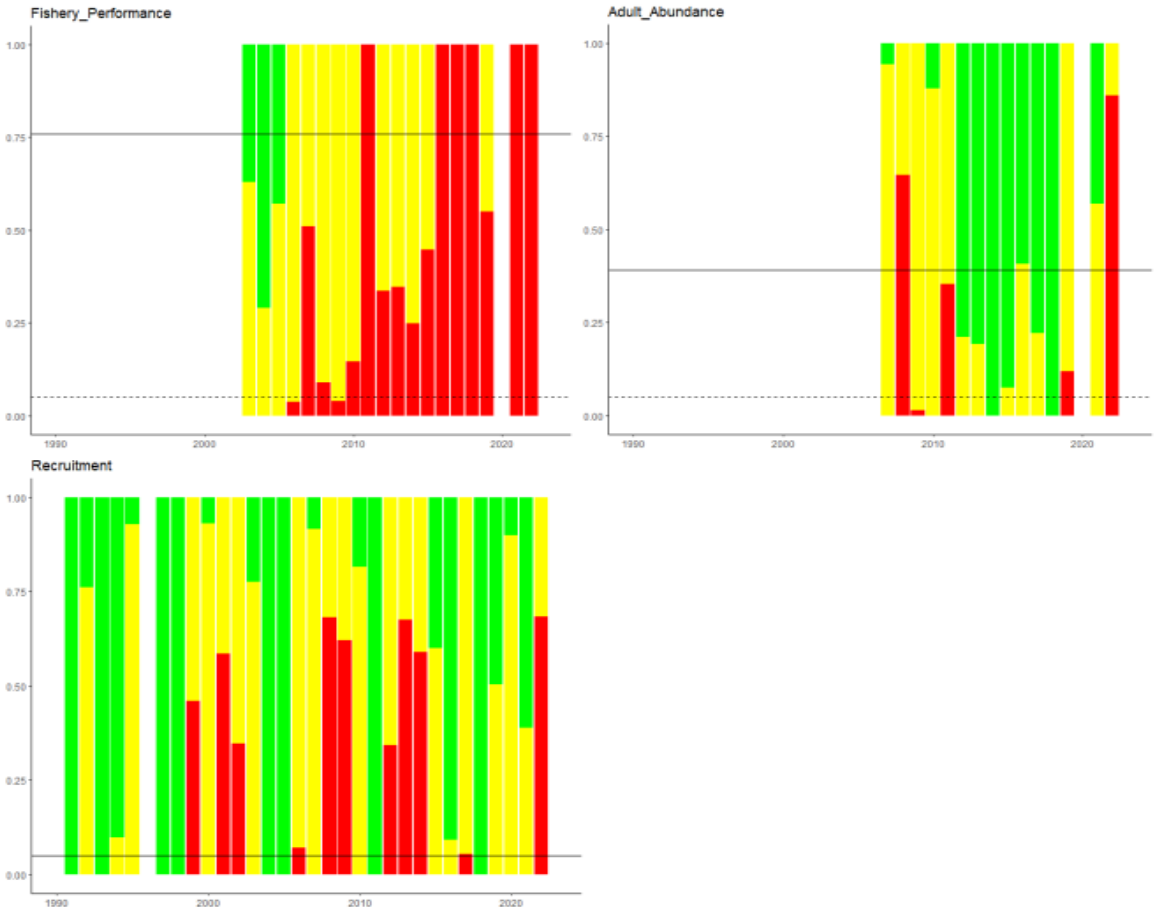


Figure 2. Northern region (including North Carolina) annual traffic light analysis (TLA results for each selected characteristic. Threshold values are represented by the solid horizontal line. The color at the threshold is the color determination for that year.

Management measures have effectively controlled fishing mortality to a level sufficient to meet management targets. It is critical to note that reaching the target is only the first step in maintaining this fishery. For the red drum stock to be considered healthy and viable, the 40% static spawning potential ratio must be maintained continuously over time. Increases in harvest rates (relaxation of current regulations) of red drum should only be allowed if increases are not anticipated to lower the static spawning potential ratio below the management goal (40%).

**Current Regulations**

All harvest is limited to red drum between an 18-inch TL minimum size and 27-inch TL maximum size for both the recreational and commercial fisheries. The recreational bag limit is one fish per day. A daily commercial bycatch allowance and an annual cap of 250,000 pounds, with payback of any overage, constrain the commercial harvest. The commercial annual cap is monitored from September 1 to August 31. Within a fishing year, 150,000 pounds is allocated to the period between September 1 and April 30, and the remainder is allocated to the period of May 1 to August 31. Harvest of red drum is limited to bycatch where the weight of the combined catch of flounder, bluefish, black drum and/or striped mullet must exceed the daily weight of red drum landed (Proclamation F-33-2022). Check with the DMF for the most recent proclamation on red drum harvest limits including trip limits and bycatch requirements (Proclamations).

**Commercial Fishery**

North Carolina's commercial landings combined from all months of 2024 were 184,564 pounds; a slight decrease from 2023 landings (186,465 pounds; Table 1; Figure 3A). Landings were greater than the 10-year average (140,820 pounds). Since 1991, landings have fluctuated with no consistent trend.

Table 1. Red drum recreational harvest and number released (Marine Recreational Information Program) and commercial harvest (North Carolina Trip Ticket Program), 1991–2024. All weights are in pounds.

| | Recreational | | | Commercial | |
|---|---|---|---|---|---|
| Year | Number Landed | Number Released | Weight Landed (lb) | Weight Landed (lb) | Total Weight Landed (lb) |
| 1991 | 111,787 | 336,524 | 345,911 | 96,045 | 441,956 |
| 1992 | 48,099 | 140,866 | 233,100 | 128,497 | 361,597 |
| 1993 | 107,235 | 442,230 | 538,175 | 238,099 | 776,274 |
| 1994 | 72,245 | 185,906 | 349,317 | 142,169 | 491,486 |
| 1995 | 151,145 | 373,695 | 692,063 | 248,122 | 940,185 |
| 1996 | 90,177 | 97,663 | 391,364 | 113,338 | 504,702 |
| 1997 | 22,829 | 426,993 | 98,079 | 52,502 | 150,581 |
| 1998 | 164,693 | 388,288 | 843,571 | 294,366 | 1,137,937 |
| 1999 | 151,062 | 633,951 | 701,002 | 372,942 | 1,073,944 |
| 2000 | 127,165 | 443,747 | 655,251 | 270,953 | 926,204 |
| 2001 | 57,929 | 538,370 | 290,901 | 149,616 | 440,517 |
| 2002 | 127,559 | 1,515,679 | 571,102 | 81,370 | 652,472 |
| 2003 | 73,202 | 215,277 | 359,181 | 90,525 | 449,706 |
| 2004 | 58,543 | 369,326 | 245,163 | 54,086 | 299,249 |
| 2005 | 103,275 | 967,892 | 470,914 | 128,770 | 599,684 |
| 2006 | 127,412 | 1,042,564 | 569,699 | 169,206 | 738,905 |
| 2007 | 157,577 | 818,037 | 789,430 | 243,658 | 1,033,088 |
| 2008 | 112,938 | 1,510,133 | 523,607 | 229,809 | 753,416 |
| 2009 | 214,317 | 1,238,158 | 1,028,339 | 200,296 | 1,228,635 |
| 2010 | 179,828 | 1,670,693 | 835,143 | 231,828 | 1,066,971 |
| 2011 | 156,484 | 587,369 | 737,853 | 91,980 | 829,833 |
| 2012 | 152,005 | 4,939,534 | 648,342 | 66,519 | 714,861 |
| 2013 | 520,758 | 1,892,171 | 2,214,045 | 371,949 | 2,585,994 |
| 2014 | 324,303 | 1,086,967 | 1,674,595 | 90,650 | 1,765,245 |
| 2015 | 143,876 | 1,308,072 | 567,730 | 80,388 | 648,118 |
| 2016 | 169,195 | 3,203,452 | 633,496 | 77,101 | 710,597 |
| 2017 | 353,716 | 2,165,656 | 1,475,852 | 187,039 | 1,662,891 |
| 2018 | 299,577 | 1,729,260 | 1,452,358 | 144,647 | 1,597,005 |
| 2019 | 97,186 | 2,976,601 | 436,219 | 56,419 | 492,638 |
| 2020 | 413,419 | 2,686,150 | 1,758,789 | 165,666 | 1,924,455 |
| 2021 | 325,662 | 2,545,371 | 1,479,550 | 200,825 | 1,680,375 |
| 2022 | 336,280 | 2,160,742 | 1,615,108 | 175,090 | 1,790,198 |
| 2023 | 232,133 | 1,439,370 | 1,120,661 | 186,465 | 1,307,126 |
| 2024 | 322,307 | 1,809,302 | 1,354,244 | 184,564 | 1,538,808 |
| Mean | 186,282 | 1,076,016 | 836,616 | 165,162 | 979,872 |

The North Carolina Red Drum FMP (2001) maintained the 250,000-pound annual commercial landings cap but shifted the commercial fishing year to September 1 through August 31. Since that time, North Carolina's commercial landings during this fishing year have averaged 150,296 pounds. The 2007/2008, 2009/2010, and 2013/2014 fishing years had cap overages (Table 2). All overages were deducted from the following year's cap allowance. The 2023/2024 fishing year resulted in 185,259 pounds of red drum landings, well below the 250,000-pound annual cap.

Table 2. North Carolina's annual commercial harvest based on a fishing year beginning September 1 and ending August 31. September 1 fishing year began through FMP in 2001/2002 fishing year.

| Fishing Year | Landings (lb) | Annual Cap |
|---|---|---|
| 2001/2002 | 61,504 | 250,000 |
| 2002/2003 | 105,704 | 250,000 |
| 2003/2004 | 70,175 | 250,000 |
| 2004/2005 | 61,838 | 250,000 |
| 2005/2006 | 159,379 | 250,000 |
| 2006/2007 | 172,166 | 250,000 |
| 2007/2008 | 326,211 | 250,000 |
| 2008/2009* | 134,161 | 173,789 |
| 2009/2010 | 275,924 | 250,000 |
| 2010/2011** | 126,185 | 224,142 |
| 2011/2012 | 94,298 | 250,000 |
| 2012/2013 | 134,372 | 250,000 |
| 2013/2014 | 262,756 | 250,000 |
| 2014/2015*** | 140,887 | 237,244 |
| 2015/2016 | 64,150 | 250,000 |
| 2016/2017 | 109,954 | 250,000 |
| 2017/2018 | 198,648 | 250,000 |
| 2018/2019 | 105,818 | 250,000 |
| 2019/2020 | 54,175 | 250,000 |
| 2020/2021 | 207,694 | 250,000 |
| 2021/2022 | 216,528 | 250,000 |
| 2022/2023 | 189,013 | 250,000 |
| 2023/2024 | 185,259 | 250,000 |
| Mean | 150,296 | |

* Adjusted to pay back overage in 2007/2008 fishing year
** Adjusted to pay back overage in 2009/2010 fishing year
*** Adjusted to pay back overage in 2013/2014 fishing year

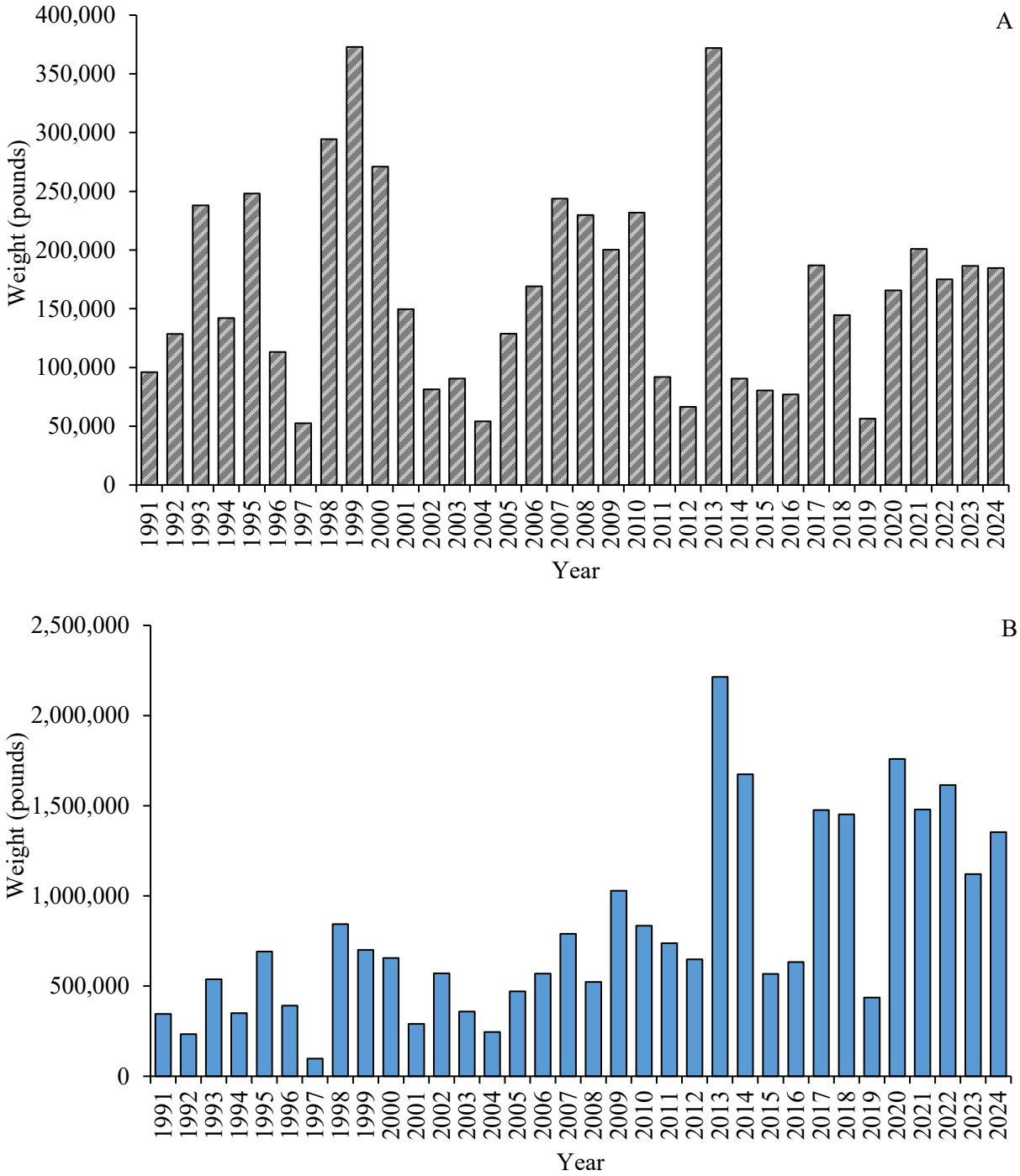


Figure 3. Annual commercial (A) and recreational (B) landings in pounds for red drum in North Carolina, 1991–2024.

**Recreational Fishery**

Recreational fishing activity is monitored through the Marine Recreational Information Program. For information on MRIP methodology see https://www.fisheries.noaa.gov/topic/recreational-fishing-data. Recreational landings in 2024 were 1,354,244 pounds; above the 10-year average (1,189,401 pounds) and above 2023 landings (1,120,661 pounds; Table 1; Figure 3B). Recreational releases totaled 1,809,302 fish

in 2024: below the ten-year average of 2,202,398 fish. Recreational releases have increased over time, averaging around 300,000 releases per year for the period of 1991 to 1998 compared to over 2 million releases per year in the most recent 10-year period.

The DMF offers award citations for exceptional catches of red drum. Red drum captured and released that measure greater than 40 inches TL are eligible for an award citation. Since 1991, award citations for red drum have steadily increased from just over 300 awarded in 1991 to a time-series high of 3,634 awarded in 2022. The total number of citations awarded in 2024 was 2,546 (Figure 4).

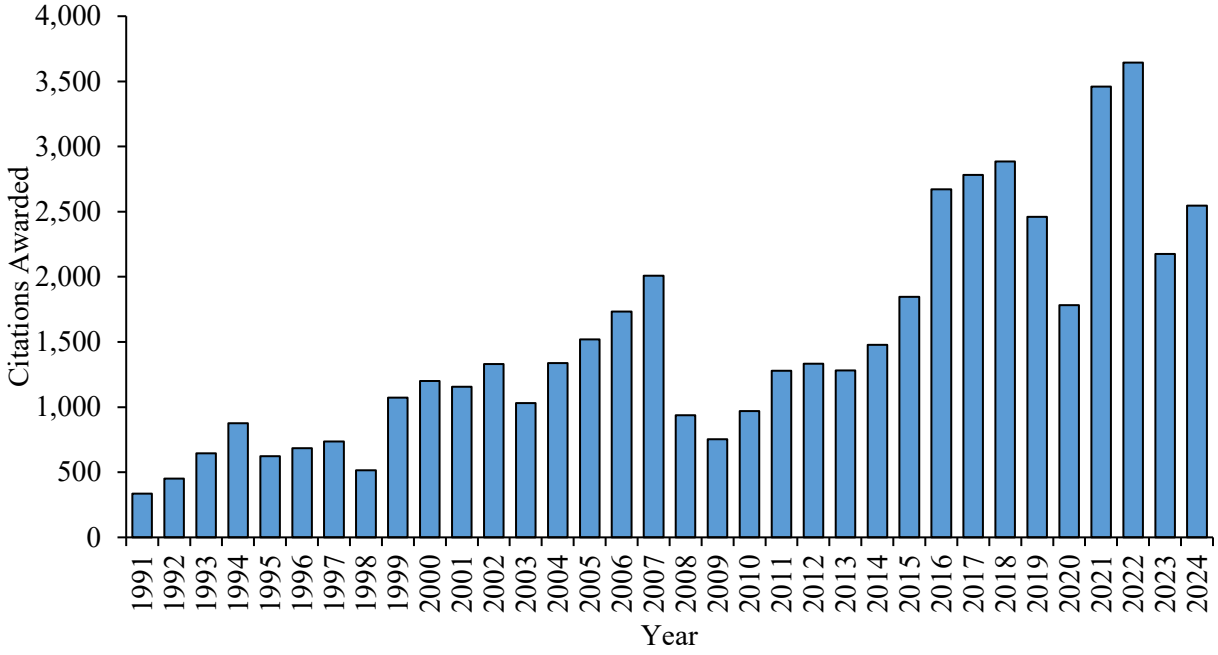


Figure 4. North Carolina Saltwater Fishing Tournament citations awarded for red drum, 1991–2024. Citations are awarded for red drum greater than 40 inches TL. Prior to 1998, citations were awarded for either a red drum released (≥40 inches TL) or harvested (≥40 pounds). Since 1998, all citations are for released fish only.

## MONITORING PROGRAM DATA

### Fishery-Dependent Monitoring

Commercial fishing activity is monitored through fishery-dependent sampling conducted by the DMF since 1982. Data collected in this program allows the size and age distribution of red drum to be characterized by gear and fishery. Historically, predominant fisheries for red drum include estuarine gill nets, long haul seine/swipe nets, pound nets, and beach haul seines. Over the past decade gill nets have been the dominant gear used for red drum, accounting for >90% of the overall commercial harvest. In 2024, 92% of the red drum commercial harvest was taken in gill nets, followed by pound nets with 7% (Figure 5). In 2024, 484 red drum, primarily from set gill nets, were measured from the commercial fishery (Table 3). The average size in 2024 was 23 inches fork length (FL). Average size has varied little over time ranging from 17 to 23 inches FL since 1989. Due to the slot limit of 18 to 27 inches TL, red drum harvested in both the commercial and recreational fishery are of similar size (Figure 6). In the commercial fishery, a shift in the size of harvest is apparent between 1991 and 1992, when the minimum size limit was increased from 14 to 18 inches TL (Figure 7). Additionally, as the harvest of larger fish was disallowed during the 1990's, fish above 27 inches TL are now rarely observed in landings due to regulations. With the current slot limit on harvest for both commercial and recreational fisheries, nearly all landings consist of age-1 and age-2 fish. In 2024, 158 red

drum were measured from recreational harvest. The average size of recreational fish harvested was 22 inches FL (Table 4). From 1989 to 2024, this average varied little (17 to 23 inches FL), however, the length frequencies of harvested red drum vary more from year to year than the commercial fishery (Figure 7 and 8).

Table 3. Red drum length (fork length, inches) data from commercial fish house samples, 1989–2024.

| Year | Mean Length | Minimum Length | Maximum Length | Total Number Measured |
|---|---|---|---|---|
| 1989 | 22 | 11 | 51 | 123 |
| 1990 | 17 | 13 | 46 | 511 |
| 1991 | 18 | 12 | 48 | 183 |
| 1992 | 23 | 11 | 49 | 311 |
| 1993 | 23 | 16 | 45 | 602 |
| 1994 | 23 | 12 | 41 | 142 |
| 1995 | 22 | 16 | 31 | 496 |
| 1996 | 23 | 16 | 26 | 120 |
| 1997 | 20 | 10 | 37 | 272 |
| 1998 | 19 | 12 | 37 | 1,082 |
| 1999 | 21 | 13 | 30 | 1,008 |
| 2000 | 22 | 16 | 31 | 725 |
| 2001 | 22 | 17 | 28 | 419 |
| 2002 | 21 | 13 | 30 | 483 |
| 2003 | 21 | 17 | 28 | 387 |
| 2004 | 22 | 16 | 28 | 326 |
| 2005 | 21 | 14 | 28 | 811 |
| 2006 | 22 | 14 | 29 | 1,258 |
| 2007 | 22 | 16 | 31 | 1,502 |
| 2008 | 23 | 13 | 29 | 1,206 |
| 2009 | 22 | 14 | 35 | 1,166 |
| 2010 | 22 | 14 | 31 | 1,134 |
| 2011 | 22 | 17 | 31 | 646 |
| 2012 | 21 | 16 | 28 | 359 |
| 2013 | 21 | 12 | 27 | 1,664 |
| 2014 | 23 | 18 | 28 | 444 |
| 2015 | 23 | 17 | 28 | 429 |
| 2016 | 21 | 16 | 27 | 681 |
| 2017 | 21 | 17 | 28 | 672 |
| 2018 | 23 | 12 | 28 | 561 |
| 2019 | 22 | 14 | 29 | 174 |
| 2020 | 21 | 17 | 27 | 549 |
| 2021 | 22 | 13 | 27 | 759 |
| 2022 | 23 | 17 | 28 | 550 |
| 2023 | 22 | 15 | 29 | 517 |
| 2024 | 23 | 17 | 27 | 484 |

Table 4. Red drum length (fork length, inches) data from Marine Recreational Information Program recreational samples, 1989–2024.

| Year | Mean Length | Minimum Length | Maximum Length | Total Number Measured |
|---|---|---|---|---|
| 1989 | 18 | 10 | 44 | 101 |
| 1990 | 17 | 11 | 43 | 73 |
| 1991 | 18 | 6 | 46 | 101 |
| 1992 | 22 | 13 | 43 | 42 |
| 1993 | 22 | 10 | 46 | 117 |
| 1994 | 21 | 12 | 45 | 90 |
| 1995 | 21 | 8 | 47 | 240 |
| 1996 | 20 | 13 | 46 | 114 |
| 1997 | 19 | 8 | 44 | 30 |
| 1998 | 23 | 9 | 42 | 534 |
| 1999 | 22 | 14 | 29 | 199 |
| 2000 | 23 | 16 | 28 | 130 |
| 2001 | 23 | 16 | 47 | 73 |
| 2002 | 22 | 16 | 36 | 86 |
| 2003 | 23 | 18 | 31 | 52 |
| 2004 | 21 | 16 | 27 | 38 |
| 2005 | 22 | 14 | 26 | 48 |
| 2006 | 21 | 14 | 30 | 79 |
| 2007 | 23 | 17 | 27 | 71 |
| 2008 | 22 | 16 | 27 | 90 |
| 2009 | 22 | 18 | 28 | 136 |
| 2010 | 22 | 11 | 27 | 193 |
| 2011 | 22 | 17 | 29 | 147 |
| 2012 | 21 | 14 | 41 | 132 |
| 2013 | 22 | 17 | 28 | 335 |
| 2014 | 23 | 17 | 28 | 319 |
| 2015 | 21 | 14 | 27 | 101 |
| 2016 | 20 | 12 | 28 | 106 |
| 2017 | 21 | 8 | 27 | 293 |
| 2018 | 23 | 17 | 28 | 206 |
| 2019 | 21 | 13 | 27 | 87 |
| 2020 | 21 | 10 | 38 | 419 |
| 2021 | 22 | 17 | 27 | 430 |
| 2022 | 22 | 14 | 28 | 266 |
| 2023 | 23 | 17 | 27 | 203 |
| 2024 | 22 | 17 | 27 | 154 |

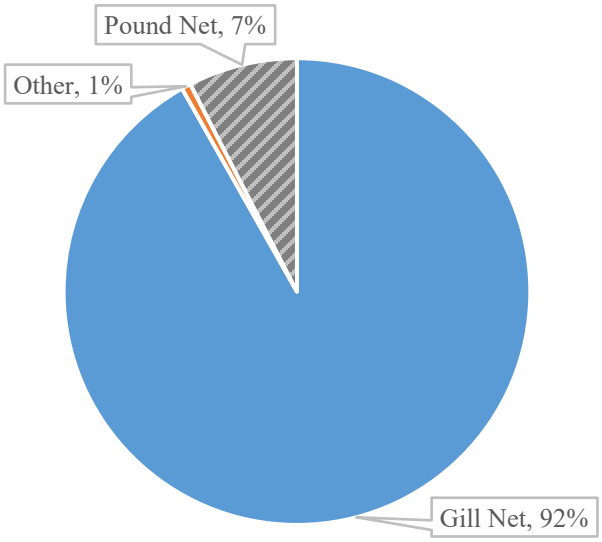


Figure 5. Red drum commercial harvest in 2024 by gear type.

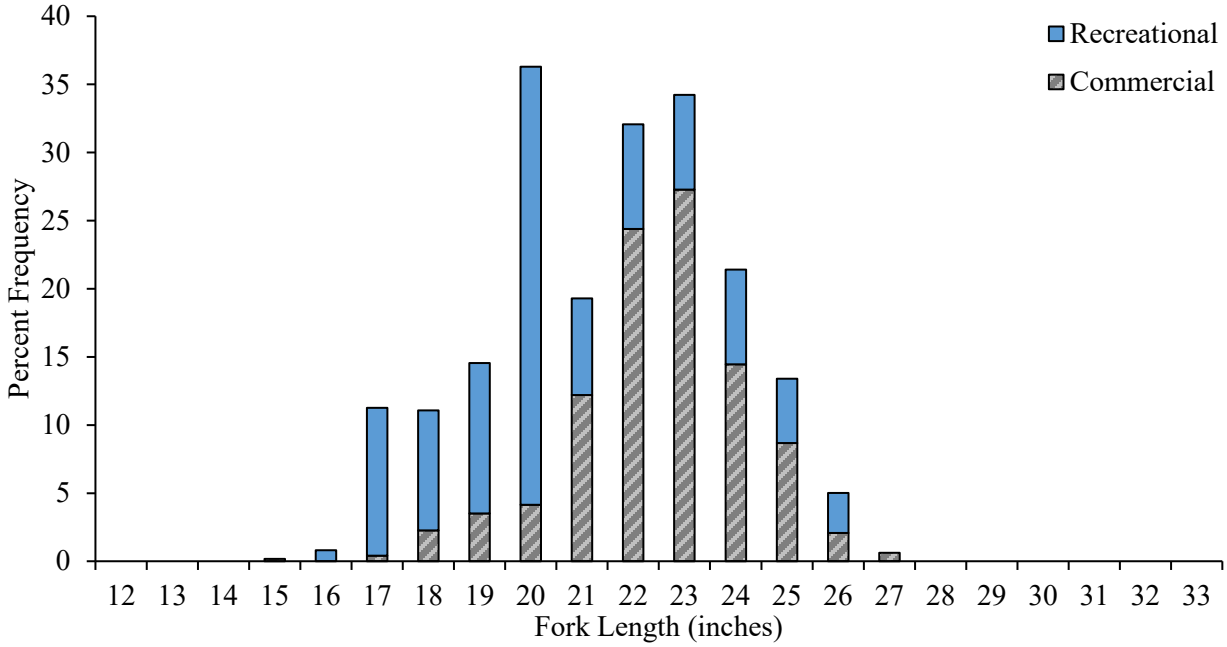


Figure 6. Commercial and recreational length frequency distribution from red drum harvested in 2024.

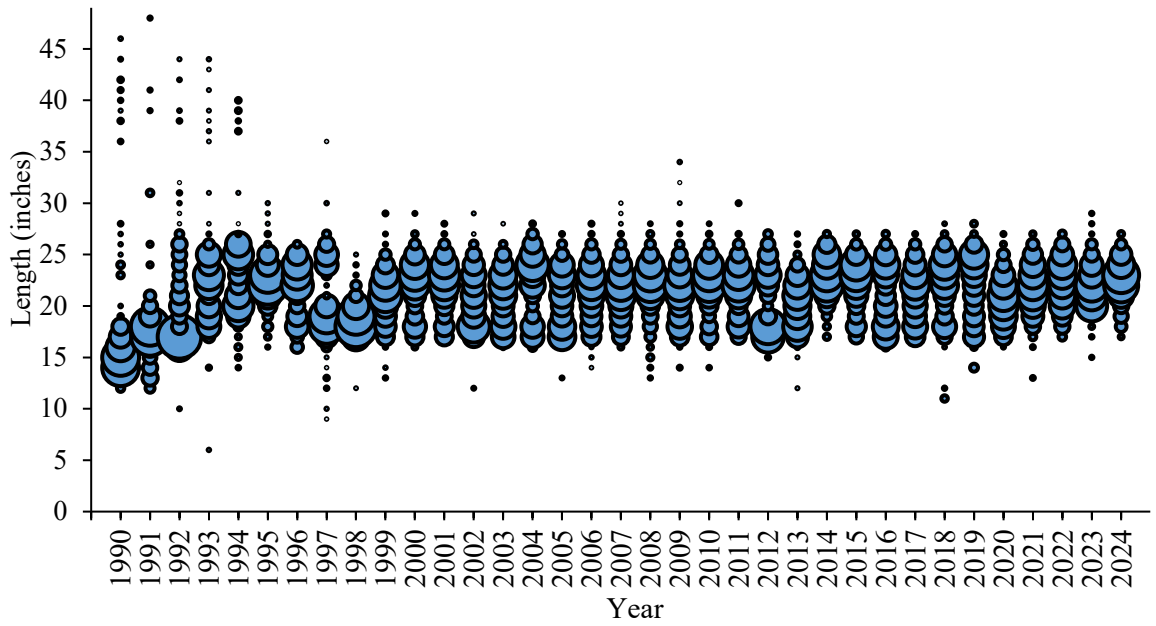


Figure 7. Commercial length frequency (fork length, inches) of harvested red drum, 1990–2024. Bubbles represent fish at length and the bubble size is proportional to the number of fish at that length.

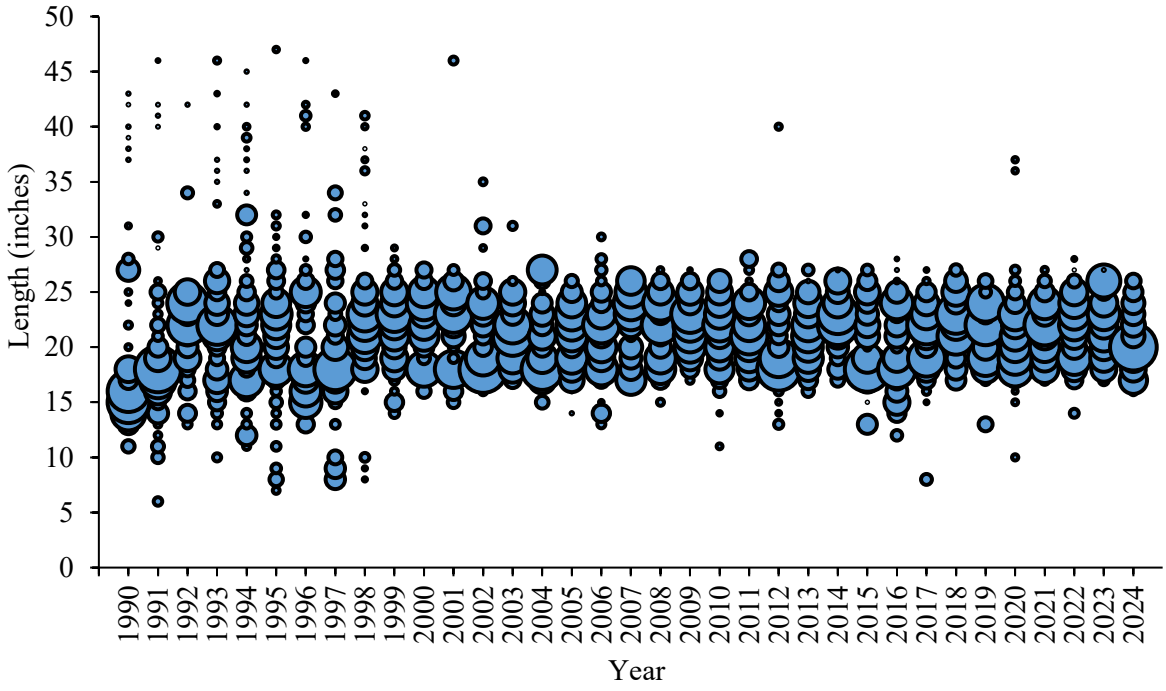


Figure 8. Recreational length frequency (fork length, inches) of harvested red drum, 1990–2024. Bubbles represent fish at length and the bubble size is proportional to the number of fish at that length.

**Fishery-Independent Monitoring**

The DMF has conducted a juvenile red drum seine survey on an annual basis since 1991. The seine survey provides an index of abundance for juvenile (age-0) red drum; sampling occurs from September through

November. The relative abundance of juvenile red drum from fixed stations is highly variable with both high and low abundance occurring in recent years (Figure 9).

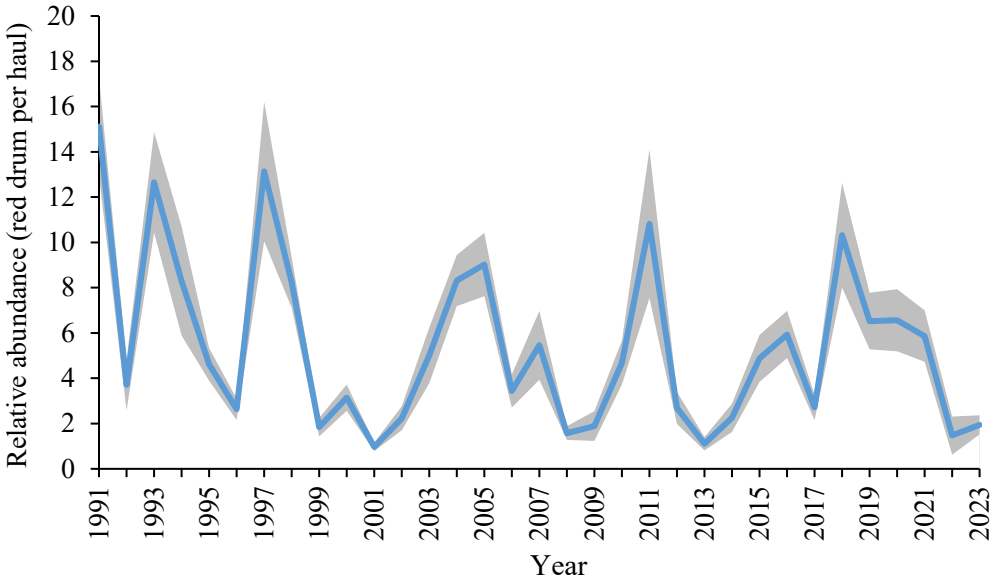


Figure 9. The annual juvenile (age-0) abundance index from fixed stations with standard error shaded in gray from the North Carolina Red Drum Juvenile Seine Survey, 1991–2023.

In 2016, the juvenile red drum seine survey was updated to include an additional 126 random grids to the survey. The grids were selected based on habitat characteristics that ensured consistent gear efficiency (bottom topography for beach seine) and likelihood of red drum. Fixed station surveys have inherent sample bias (i.e. variability in samples can be caused by temporal shifts in fish spatial distribution). Adding a partial replacement design (supplementing fixed sites with random samples) can reduce sample bias and produce a more accurate estimate of annual catch rates.

After a DMF program evaluation in 2023, the juvenile red drum seine survey was adjusted to only proceed with random grid sampling in 2024. The partial replacement survey design change formalized in 2016 aimed to reduce bias from the fixed station survey and explore any unexplained variation while maintaining the historical integrity of the survey. The JAI calculated as the arithmetic mean for both the fixed and random stations aligns closely in both scale and trend. This evaluation has provided valuable information in support of moving forward with a completely random survey that effectively captures recruitment cues. The updated station selection procedures maintain an annual 126 stations encompassing the original spatial and temporal sampling design of the program.

In 2024, the relative abundance of juvenile red drum from random grids was 3.60 red drum per haul (Figure 10). This was below the random grid time-series average of 4.16 red drum per haul (2016–2024), but an increase from 2023 abundance of 1.61 red drum per haul.

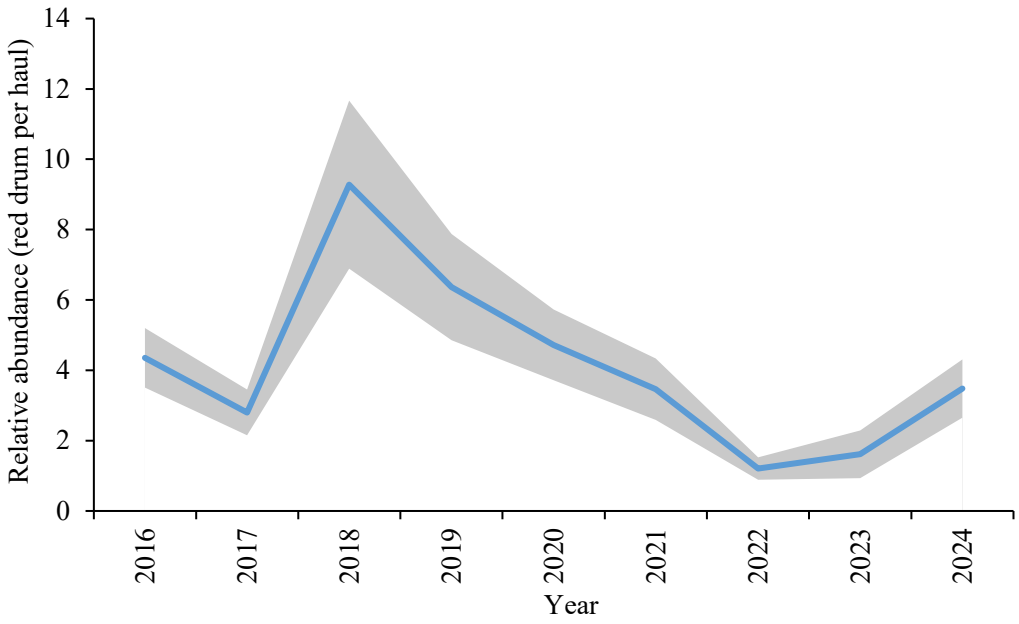


Figure 10. The annual juvenile (age-0) abundance index from random grids with standard error shaded in gray from the North Carolina Red Drum Juvenile Seine Survey, 2016–2024.

A fishery-independent gill net survey was initiated by the DMF in May 2001. The survey uses a stratified random sampling scheme designed to characterize the size and age distribution for key estuarine species in Pamlico Sound. By continuing a long-term database of age composition and developing an index of abundance for red drum, this survey allows managers to assess the red drum stock without relying solely on commercial and recreational fishery-dependent data. The overall red drum index in 2024 was 4.24 red drum per set, above the 2023 index of 2.33 and the time series average of 2.80 (Figure 11). It should be noted that sampling in this program was suspended in February 2020 due to COVID-19 restrictions and protected species interactions. Sampling resumed July 2021 (168 sets). The survey has been used in ASMFC Atlantic coast red drum stock assessments as an annual index of relative abundance for sub-adult red drum.

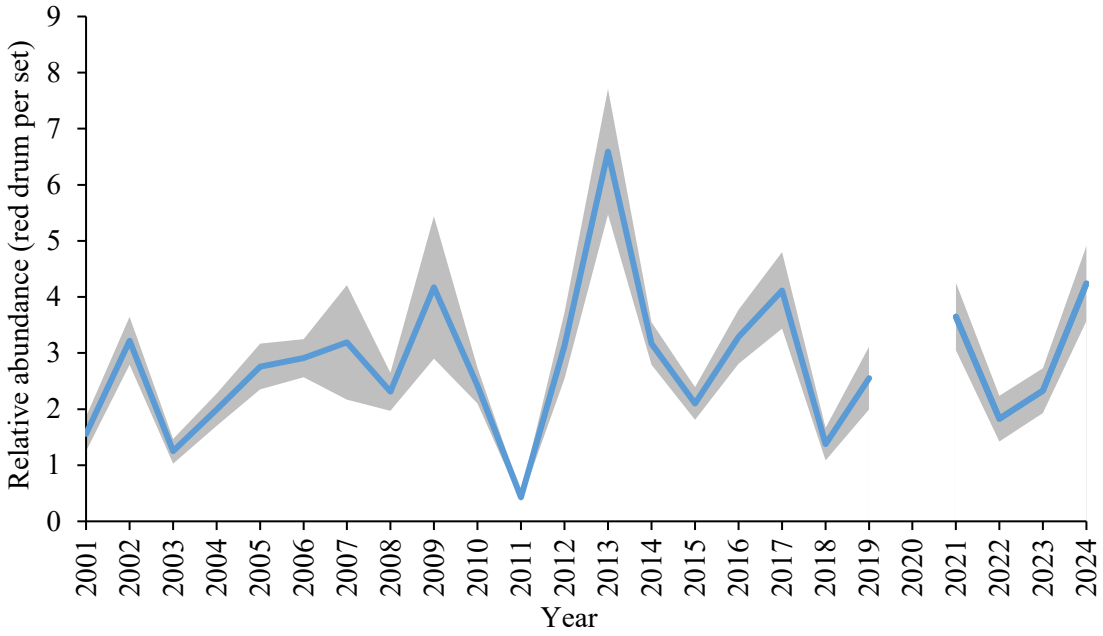


Figure 11. Annual weighted red drum index (number captured ages combined) with standard error shaded in gray from the North Carolina Pamlico Sound Independent Gill Net Survey, 2001–2024. Survey was not conducted in 2020 due to COVID pandemic and resumed July 2021 (168 sets for the year).

North Carolina initiated an adult red drum longline survey in 2007. The primary objective of the survey is to provide a fisheries-independent index of abundance for adult red drum occurring in North Carolina. From July through October, a standardized, stratified random sample design is employed. Following a programmatic evaluation in 2023 and 2024, changes to the sampling protocol were made to increase survey efficiency. In 2023, two regions with the lowest red drum catches in recent years were dropped from the sampling universe. In 2024, the mainline was shortened to 805-meter mainline, with gangions placed at 15-meter intervals (50 hooks/set). While it has been noted that adult red drum catch has been lower in the past few years, comparison of CPUE (red drum caught per hook) shows little change with hook reduction. Each of the ten regions is sampled once per period covering the Pamlico Sound and mouth of the Neuse River.

The annual adult abundance in 2024 was 2.50 red drum per 50 hook reduced set which is below the 2023 abundance (2.79 red drum per 100 hook set) and below the time series average of 4.24 red drum per set (Figure 12). Red drum were captured from 20 of the 60 sets (33%). The study has recently been impacted by significant events. Samples in 2019 were adversely impacted by Hurricane Dorian which hit the North Carolina coast at the peak of the sampling season. During 2020, sampling did not occur due to the COVID pandemic. Sampling efforts in 2022 were limited to the months of August and September due to mechanical issues with sampling gear. Sampling efforts in 2023 were reduced primarily in the month of October due to staff limitations. Sampling efforts in 2024 were reduced due to programmatic changes. This survey is used in the ASMFC red drum stock assessments as an annual index of relative abundance for adult red drum.

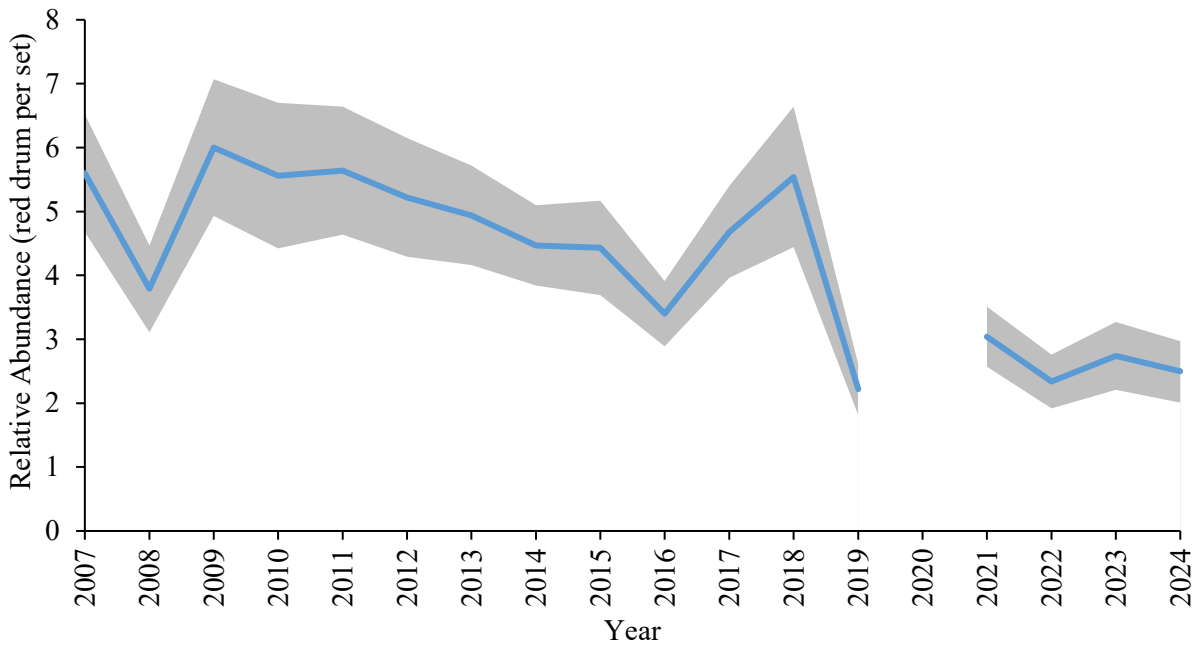


Figure 12. Annual adult red drum index (number captured for ages combined) with standard error shaded in gray from the North Carolina Red Drum Longline Survey, 2007–2024.

To describe the age structure of harvest and indices, red drum age structures are collected from various fishery-independent (scientific surveys) and dependent (commercial and recreational fisheries) sources throughout the year. In 2024, 760 red drum age structures were processed, ranging in age from 0 to 36 years (Table 5). Most red drum collected from dependent sources (18 to 27 inches TL) are age 1 or 2. Red drum over 27 inches TL are protected from harvest in North Carolina, a measure designed to protect the spawning portion of the population, so age samples from larger fish come almost exclusively from fishery-independent sources. Red drum in North Carolina are long-lived with the oldest red drum being aged at 62 years. Growth in length is rapid for the first several years of life and then slows as fish reach maturity (100% mature by age 4- and 32-inches TL). Beyond age-4, the relationship of length and age for red drum is less predictable with much overlap in age for a given length (Figure 13).

Table 5. Summary of red drum age samples collected from both dependent (commercial and recreational fisheries) and independent (surveys) sources, 1989–2024. Age sampling was limited in 2020 due to the adult long line survey not being conducted.

| Year | Modal Age | Minimum Age | Maximum Age | Total Number Aged |
|---|---|---|---|---|
| 1989 | 1 | 0 | 56 | 312 |
| 1990 | 1 | 0 | 52 | 345 |
| 1991 | 1 | 0 | 48 | 259 |
| 1992 | 1 | 0 | 56 | 440 |
| 1993 | 1 | 0 | 62 | 428 |
| 1994 | 1 | 0 | 41 | 297 |
| 1995 | 1 | 0 | 47 | 482 |
| 1996 | 1 | 0 | 54 | 383 |
| 1997 | 1 | 0 | 56 | 465 |
| 1998 | 1 | 0 | 31 | 612 |
| 1999 | 1 | 0 | 26 | 530 |
| 2000 | 1 | 0 | 17 | 470 |
| 2001 | 1 | 0 | 41 | 466 |
| 2002 | 1 | 0 | 24 | 361 |
| 2003 | 1 | 0 | 28 | 262 |
| 2004 | 1 | 0 | 25 | 342 |
| 2005 | 1 | 0 | 34 | 484 |
| 2006 | 1 | 0 | 32 | 641 |
| 2007 | 1 | 0 | 37 | 495 |
| 2008 | 1 | 0 | 35 | 574 |
| 2009 | 1 | 0 | 36 | 644 |
| 2010 | 1 | 0 | 37 | 516 |
| 2011 | 1 | 0 | 38 | 256 |
| 2012 | 1 | 0 | 39 | 605 |
| 2013 | 1 | 0 | 41 | 721 |
| 2014 | 1 | 0 | 41 | 560 |
| 2015 | 1 | 0 | 42 | 428 |
| 2016 | 1 | 0 | 38 | 653 |
| 2017 | 1 | 0 | 39 | 726 |
| 2018 | 1 | 0 | 42 | 594 |
| 2019 | 1 | 0 | 33 | 722 |
| 2020 | 1 | 0 | 16 | 315 |
| 2021 | 1 | 0 | 43 | 998 |
| 2022 | 2 | 0 | 43 | 773 |
| 2023 | 1 | 0 | 32 | 831 |
| 2024 | 1 | 0 | 36 | 760 |

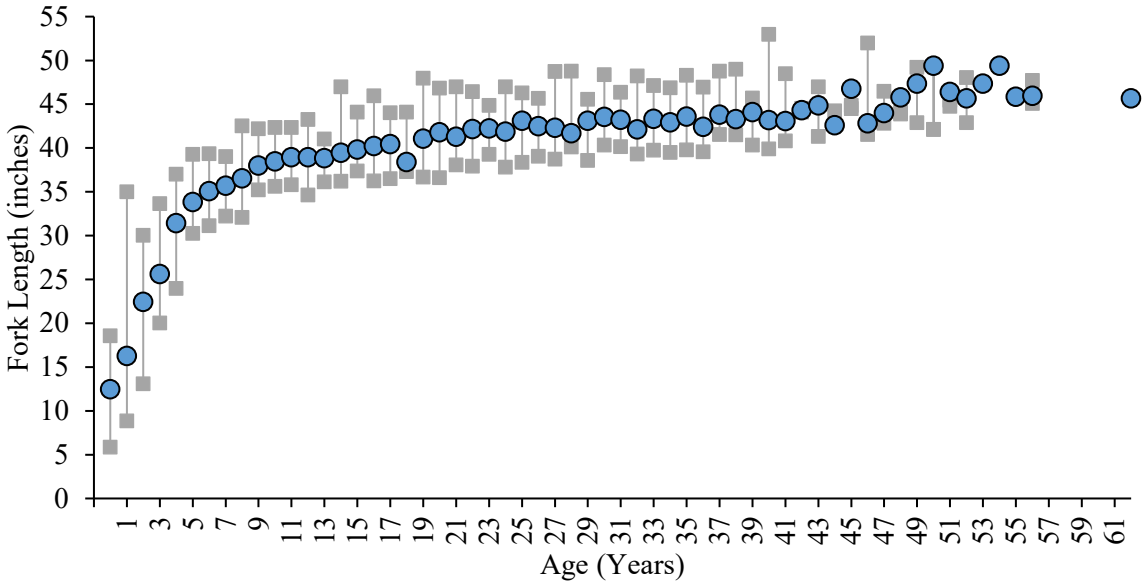


Figure 13. Red drum length-at-age based on all age samples collected from fishery-independent and dependent sources, 1989–2024. Blue circles represent the mean size at a given age while the grey squares represent the minimum and maximum observed size for each age.

**Tagging Program**

In 2014, a mark-recapture tagging program was initiated utilizing both volunteer anglers and DMF staff throughout the state. Red drum under 27 inches TL are tagged with an internal anchor tag, and red drum over 27 inches TL are tagged with a stainless-steel dart tag. The total number of red drum tagged in 2024 was 847 resulting in 98 recaptures (Table 6; Figure 14A). The time series average was 248 days at large with an average distance travelled of 16 miles (Table 6). Most recaptures occur within the state of NC, however, the maximum distance travelled was 276 miles into New Jersey waters (Figure 14B). The maximum days between release and recapture was 3,214 days or just over 8 years (Table 6). Information gathered from this survey is being considered as an input parameter in future ASMFC Atlantic coast red drum stock assessments.

Table 6. Total tagged, total recaptured, average days at large, maximum days at large, average distance traveled (miles), and maximum distance traveled (miles) for red drum tagged in the DMF Multi-Species Tagging Program from calendar year 2014–2024.

| Year Tagged | Total Fish Tagged (#) | Total Fish Recaptured (#) | Average Days At Large | Max Days At Large | Avg. Distance Traveled (miles) | Max Distance Traveled (miles) |
|---|---|---|---|---|---|---|
| 2014 | 1,157 | 54 | 344 | 3,192 | 33 | 174 |
| 2015 | 1,864 | 192 | 288 | 3,214 | 23 | 230 |
| 2016 | 2,200 | 227 | 274 | 2,059 | 18 | 276 |
| 2017 | 2,161 | 224 | 277 | 2,407 | 17 | 137 |
| 2018 | 1,406 | 159 | 255 | 2,340 | 19 | 135 |
| 2019 | 1,119 | 163 | 325 | 1,850 | 16 | 141 |
| 2020 | 950 | 193 | 226 | 1,423 | 12 | 126 |
| 2021 | 973 | 146 | 223 | 1,266 | 13 | 111 |
| 2022 | 877 | 144 | 204 | 838 | 13 | 153 |
| 2023 | 935 | 158 | 185 | 737 | 12 | 132 |
| 2024 | 847 | 98 | 122 | 353 | 10 | 102 |
| Total | 14,489 | 1,758 | 248 | 3,214 | 16 | 276 |

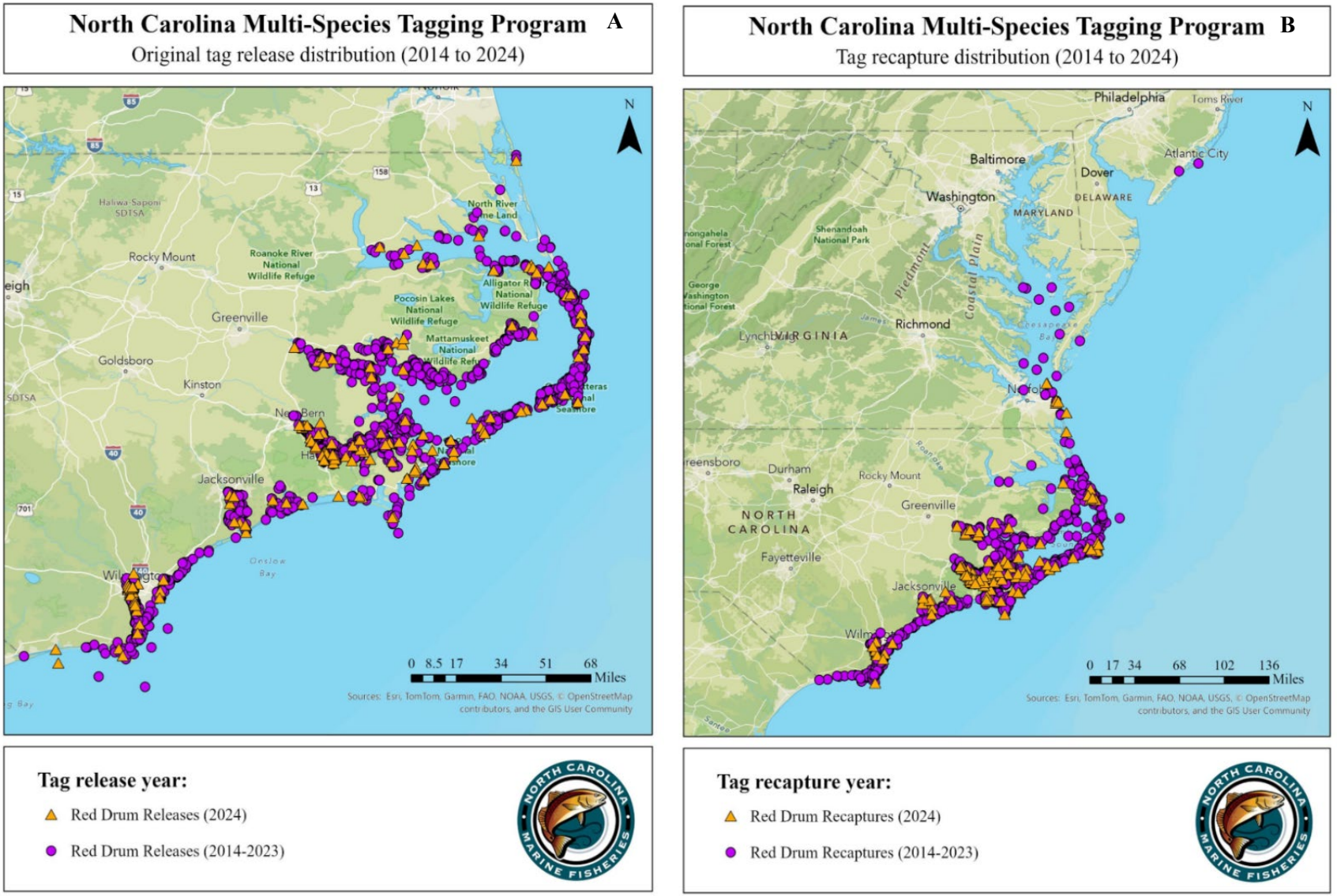


Figure 14. Red drum tagging release (A) and recapture locations (B), DMF Multi-Species Tagging Program from calendar year 2014–2024.

## RESEARCH NEEDS

The following management and research needs are summarized from Amendment 1 to the North Carolina Red Drum FMP (status of need provided in parenthesis):

### High

- Improve catch and effort data for the red drum recreational fishery, particularly for the adult fishery that occurs at night. Assess the size distribution of recreational discards (needed).
- Improved socio-economic data collection on the recreational and commercial fishery, including information on current conflicts and potential for future conflicts in these fisheries (needed).
- Conduct studies to explore ways to reduce red drum regulatory discards with commercial gear while allowing the retention of targeted species (needed).
- Conduct additional research to determine the release mortality of red drum (needed).
- Identify coastal wetlands and other habitats utilized by juvenile red drum and assess relationship between changes in recruitment success and changes in habitat conditions (needed).

### Medium

- Obtain discard estimates from the commercial fisheries including information on size and disposition (ongoing through DMF observer program, recent expanded coverage).
- Conduct a comprehensive study of gill net fishers including information on species targeted, gear characteristics and areas fished (needed, valuable ongoing data from fish house sampling and commercial observer program).
- Examine ecological use and importance of shell bottom to red drum. Determine if designation of spawning areas is needed, and if specific protective measures should be developed (needed; some work through CRFL by UNC).
- Assess cumulative impact of large-scale beach nourishment and inlet dredging on red drum and other demersal fish that use the surf zone. Determine if navigational dredging between August and October significantly impacts spawning activity (needed).

### Low

- Evaluate and improve independent surveys to monitor both the sub-adult and adult red drum populations (ongoing through DMF gillnet and longline surveys).
- Continue life history studies for age and growth. Additional work needed to update maturity schedule for the Northern Stock (age, growth, and maturity ongoing through DMF previous diet work through NCSU).
- Collect data to estimate movement rates of sub-adults in inshore waters and the adult population in offshore/nearshore waters for development of a multiarea assessment model (needed, ongoing NCDMF and NCMEF satellite tagging project).

## MANAGEMENT

Red drum in North Carolina are managed under Amendment 1 to the North Carolina Red Drum FMP and Amendment 2 to the ASMFC Red Drum FMP. Both plans have an identical management threshold (overfishing) and management target (30% and 40% static spawning potential ratio) which is determined by a formal, peer reviewed stock assessment. Amendment 2 to the ASMFC Red Drum FMP requires specific compliance criteria, including harvest restrictions designed to achieve the management target. Any changes to harvest that deviate from options provided in the plan must be approved by the ASMFC South

Atlantic Board. Amendment 1 to the North Carolina Red Drum FMP maintained measures for compliance and implemented measures to reduce losses from discards in both the recreational and commercial fisheries.

As of May 7th, 2025, the Atlantic States Marine Fisheries Commission's Sciaenid's Management Board initiated Draft Addendum II to Amendment 2 to the Interstate Fishery Management Plan for Red Drum.

## FISHERY MANAGEMENT PLAN SCHEDULE RECOMMENDATIONS

The most recent red drum stock assessment was completed in 2024. The next planned formal review of the North Carolina Red Drum FMP is set to begin in July 2025 to accommodate 2024 stock assessment results and any potential ASMFC management changes. It should be noted that any changes to the state FMP must consider compliance requirements of the ASMFC plan.

## LITERATURE CITED


ASMFC (Atlantic States Marine Fisheries Commission). 2002. Amendment 2 to the Interstate Fishery Management Plan for Red Drum. ASMFC, Washington, DC, Fishery Management Report No. 38, 141 pp.

ASMFC. 2017. Red Drum Stock Assessment and Peer Review Report. Atlantic States Marine Fisheries Commission, Stock Assessment Report, 126 pp.

ASMFC. 2022. Red Drum Simulation Assessment and Peer Review Report. Atlantic States Marine Fisheries Commission, Simulation Assessment Report, 567 pp.

ASMFC. 2024. Red Drum Benchmark Stock Assessment. Atlantic States Marine Fisheries Commission, Stock Assessment Report, 437 pp.

NCDMF (North Carolina Division of Marine Fisheries). 2001. Red Drum Fishery Management Plan. North Carolina Division of Marine Fisheries, Morehead City, NC. 110 pp. + appendices.

NCDMF. 2008. North Carolina Red Drum Fishery Management Plan Amendment 1. North Carolina Division of Marine Fisheries, Morehead City, NC. 191 pp. + appendices.

NCDMF. 2022. North Carolina Fishery Management Plan for Interjurisdictional Fisheries, 2022 Information Update. North Carolina Division of Marine Fisheries, Morehead City, North Carolina. 19 pp.

SAFMC (South Atlantic Fishery Management Council). 2009. Southeast Data, Assessment and Review 18, Stock Assessment Report, Atlantic Red Drum. North Charleston, SC. 544 pp.

Takade, H and L Paramore. 2007. Stock Status of the Northern Red Drum Stock. North Carolina Division of Marine Fisheries. In-House Report, 60 pp.