

**FISHERY MANAGEMENT PLAN UPDATE
DOLPHIN
AUGUST 2022**

STATUS OF THE FISHERY MANAGEMENT PLAN

Fishery Management Plan History

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|--------------------|------------------------|---------------|
| FMP Documentation: | June 2004 | |
| | Amendment 1 | July 2010 |
| | Amendment 2 | April 2012 |
| | Amendment 3 | August 2014 |
| | Amendment 5 | July 2014 |
| | Amendment 6 | January 2014 |
| | Amendment 7 | January 2016 |
| | Amendment 8 | February 2016 |
| | Regulatory Amendment 1 | March 2017 |
| | Amendment 12 | June 2021 |
| | Amendment 10 | May 2022 |

Comprehensive Review: None

The South Atlantic Fishery Management Council (SAFMC), in cooperation with the Mid-Atlantic and New England Councils, developed a Dolphin/Wahoo Fishery Management Plan (FMP) for the Atlantic in 2004. While dolphin was not overfished, the Council adopted a precautionary and risk-averse approach to management for this fishery. The original FMP established a 20-inch fork length (FL) minimum size limit off Georgia and Florida; identified allowable gears in the fishery; and prohibited the use of longline gear to harvest dolphin in areas closed to use of such gear for highly migratory species. Amendment 1 (2010) provided spatial information of Council-designated Essential Fish Habitat and Habitat Areas of Particular Concern relative to the dolphin wahoo fishery. Amendment 2 (SAFMC 2011) established Allowable Biological Catch (ABC), Annual Catch Limits (ACL), Accountability Measures (AM), modified the allocations for both commercial and recreational sectors, established Annual Catch Targets (ACT) for the recreational sector, prohibited bag limit sales of dolphin from for-hire vessels, and established a 20-inch FL minimum size limit for South Carolina. Amendment 3 (SAFMC 2014, 79 F.R. 19490) required federal dealer permits, and changed the method and frequency of reporting harvest. Amendment 4 (in progress) would change the method of reporting commercial harvest of dolphin through the existing logbook program and is included under the Joint Generic Commercial Logbook Reporting Amendment. In 2013, Amendment 5 (SAFMC 2013) was approved and adopted by the SAFMC and was the most comprehensive amendment to the Dolphin/Wahoo FMP, in terms of process updates. Amendment 5 updated the ACLs and AM for both sectors, as well as the ABC values and ACT for the recreational fishery as a result of improvements to the recreational catch estimation methods used by the Marine Recreational Information Program (MRIP). This amendment also set up an abbreviated framework procedure whereby modifications to the ACLs, ACTs, and AMs can be implemented by the National Oceanic and Atmospheric Administration (NOAA) Fisheries without a full FMP amendment. Amendment 7 (SAFMC 2015a) allowed for dolphin and wahoo

filets to enter the U.S. EEZ after lawful harvest in the Bahamas. Amendment 8 (SAFMC 2015b) adjusted sector allocations and increased the commercial ACL to 10% of the total ACL. Regulatory Amendment 1 (SAFMC 2016), effective March 2017, established a commercial trip limit for vessels with an Atlantic dolphin/wahoo permit of 4,000 pounds for the dolphin commercial sector once 75% of the commercial ACL is landed. This regulatory change was pursued after the 2015 commercial ACL was met and commercial harvest was closed in late June of that year.

Amendment 12 was approved by the Council at its September 2020 meeting and became effective June 6, 2021 (SAFMC 2020). Amendment 12 adds bullet mackerel and frigate mackerel to the Dolphin Wahoo Fishery Management Plan and designates them as ecosystem component species. Amendment 10 was approved by the Council at its September 2021 meeting and became effective May 2, 2022 (SAFMC 2020). Amendment 10 includes actions that accommodate updated recreational data from the MRIP by revising the annual catch limits and sector allocations for dolphin and wahoo. The amendment also contains actions that implement other management changes in the fishery including revising accountability measures, accommodating possession of dolphin and wahoo on vessels with certain unauthorized gears onboard, removing the operator card requirement, and reducing the recreational vessel limit for dolphin and wahoo.

To ensure compliance with interstate requirements, North Carolina also manages this species under 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, SAFMC, or the Atlantic States Marine Fisheries Commission 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 (Atlantic States Marine Fisheries Commission plans), are, like the goals of the Fisheries Reform Act of 1997, to “ensure long-term viability” of these fisheries (NCDMF 2015).

Management Unit

The management unit is the population of dolphin (common dolphin - *Coryphaena hippurus* and pompano dolphin - *Coryphaena equiselis*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts in the 3 to 200-mile Exclusive Economic Zone (EEZ).

Goal and Objectives

The goal of the plan is to maintain the current harvest levels of dolphin and ensure that no new fisheries develop (SAFMC 2003). With the potential for effort shifts in the historical commercial longline fisheries for sharks, tunas, and swordfish, these shifts or expansions into nearshore coastal waters to target dolphin could compromise the historical (1994-1997) and current allocation of the dolphin resource between recreational and commercial fishermen. To achieve these goals, the following management objectives were identified:

- Address localized reduction in fish abundance. The Councils remain concerned over the potential shift of effort by longline vessels to traditional recreational fishing grounds and the resulting reduction in local availability if commercial harvest intensifies.
- Minimize market disruption. Commercial markets (mainly local) may be disrupted if large quantities of dolphin are landed from intense commercial harvest or unregulated catch and landing by charter or other components of the recreational sector.
- Minimize conflict and/or competition between recreational and commercial user groups. If commercial longlining effort increases, either directing on dolphin and wahoo or targeting these species as a significant bycatch, conflict and/or competition may arise if effort shifts to areas traditionally used by recreational fishermen.
- Optimize the social and economic benefits of the dolphin fishery. Given the significant importance of dolphin to the recreational sector throughout the range of these species and management unit, manage the resources to achieve optimum yield on a continuing basis.
- Reduce bycatch of the dolphin fishery. Bycatch is a problem in the pelagic longline fishery for highly migratory species. Any increase in overall effort, and more specifically shifts of effort into nearer shore, non-traditional fishing grounds by swordfish and tuna vessels, may result in increased bycatch of non-target species. In addition, National Standard 9 requires that: “Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.” Therefore, bycatch of the directed dolphin fishery must be addressed.
- Direct research to evaluate the role of dolphin and wahoo as predator and prey in the pelagic ecosystem.
- Direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

DESCRIPTION OF THE STOCK

Biological Profile

Dolphin, also called mahi-mahi, dorado or common dolphin, are pelagic marine species and can be found worldwide in tropical and subtropical waters. They are sight feeders and usually live in the top 50 feet of the water column. They gather around floating debris and flotsam and prefer water temperatures ranging from 21 – 30 degrees Celsius (70 - 86 degrees Fahrenheit). Adult male and female fish are commonly referred to as ‘bulls’ and ‘cows’ respectively, because of their different shapes and appearance. Mature male dolphin have a high, flat forehead unlike females. The species is short lived (maximum age is 4) and grows rapidly, with some fish reaching lengths of 36 inches by age-1 (Schwenke et al. 2008). The state record for dolphin was caught off Cape Hatteras in 1993 and weighed 79 pounds; however, most fish landed in North Carolina weigh between 5 and 25 pounds. Dolphin can become sexually mature by four months and as small as 14 inches FL with most fish maturing by 24 inches FL (Schwenke et al. 2008). They are considered batch spawners, meaning they will spawn many times throughout the spawning season, maximizing the survival of larval fish. Spawning occurs offshore of North Carolina around floating

grass (brown algae known as Sargassum) and debris during the spring and summer months. In tropical areas, dolphins have been known to spawn year-round.

Stock Status

A surplus production model, as part of an exploratory stock assessment, was fit to abundance indices estimated from long line catches and total landings of the fisheries from years 1985 to 1997. It was concluded that the stock status, as of 1998, was above biomass at maximum sustainable yield (BMSY) and the species can withstand a relatively high rate of exploitation (Prager 2000).

Stock Assessment

A stock assessment is not available for this species.

DESCRIPTION OF THE FISHERY

Current Regulations

The North Carolina Division of Marine Fisheries (NCDMF) currently complements the management measures of the Dolphin/Wahoo FMP through rule (15A NCAC 03M .0515) and proclamation (15A NCAC 03M. 0512). It is unlawful to possess more than 10 dolphin per person per day or more than 54 dolphin per vessel per day. Headboats are excluded from the vessel limit requirement. It is also unlawful to sell a recreational bag limit of dolphin harvested by a person on a vessel while it is operating as a charter vessel or headboat or to sell dolphin without a Federal Commercial Dolphin/Wahoo Vessel Permit. Commercially harvested dolphin must be at least 20 inches fork length. There is no trip limit for vessels that possess the Federal Commercial Dolphin/Wahoo Vessel Permit unless 75% of the commercial ACL is reached, at which time a 4,000-pound weight trip limit is implemented. Commercial vessels that are federally permitted in another fishery are allowed to land up to 200 pounds of dolphin and wahoo combined.

Commercial Fishery

Commercial landings of dolphin are reported through the mandatory NCDMF Trip Ticket program. Landings since 1986 have fluctuated with a low of 26,112 pounds in 2021 and a high of 611,962 pounds in 2009 (Table 1; Figure 1). Commercial landings in 2021 (26,112 pounds) were much lower than the time series average (198,695 pounds), and the lowest landings of the time series.

Recreational Fishery

Recreational landings of dolphin are estimated from the MRIP. Recreational estimates across all years have been updated and are now based on the MRIP's new Fishing Effort Survey-based calibrated estimates. For more information on MRIP see <https://www.fisheries.noaa.gov/topic/recreational-fishing-data>.

From 1981 to 2009, recreational dolphin landings had been steadily increasing. Subsequently, from 2010 to present, dolphin landings have slowly declined. After peaking in 2009 (6,380,552 pounds), landings of dolphin fluctuated between highs in 2015 (5,610,008 pounds) and 2016 (5,099,647 pounds) and lows in 2017 (2,223,509 pounds), 2020 (2,149,038 pounds), and 2021 (1,971,454 pounds; Table 1; Figure 2). It is likely the decline in dolphin landings in 2021, in addition to a decline in citations (see below), was due to fewer for-hire trips taking place in North Carolina because of COVID-19.

The NCDMF offers award citations for recreational fishermen who land dolphin greater than 35 pounds. The number of citations awarded annually since the program started for dolphin has been variable, with a declining trend observed from 2013-2018 (Table 2; Figure 2). Although the total number of citations awarded through the North Carolina Saltwater Fishing Tournament increased in 2019 (181 citations), citations declined in 2020 (94 citations) and 2021 to the lowest number recorded in the time series (68 citations; 1991-2020).

MONITORING PROGRAM DATA

Fishery-Dependent Monitoring

Fishery dependent length-frequency information for the commercial dolphin fishery in North Carolina is collected by fish house samplers, specifically through NCDMF programs 438 (Offshore Live Bottom Fishery) and 439 (Coastal Pelagic). The number of commercial dolphin lengths collected in 2021 (194 samples) was above time series average of 186 samples (Table 3; Figure 3). The average size of dolphin sampled from the commercial fishery increased in 2021 (32.1 inches fork length) from the previous year (26.0 inches fork length) and was above the time series average (27.8 inches fork length; Table 3; Figure 4). The maximum size of dolphin sampled from the commercial fishery also increased in 2021 (59.8 inches fork length) from 2020 (43.5 inches fork length) to the largest in the time series (Table 3; Figure 4).

Length and weight information for the recreational fishery are collected through the MRIP dockside sampling. The average size of dolphin sampled from the recreational fishery decreased from 28.0 inches fork length in 2020 to 26.1 inches fork length in 2021, but overall has remained relatively constant throughout the time series (Table 3; Figure 5). The minimum size of dolphin sampled from the recreational fishery in 2021 (13.7 inches fork length) was slightly below the time series average from 1981-2021, and the maximum size sampled in 2021 (55.1 inches fork length) slightly below the previous year (55.3 inches fork length) and the time series average of 53.4 inches fork length.

The modal length for the commercial fishery (26 inches fork length) was much greater than the recreational fishery (21 inches fork length) in 2021 (Figure 3; Figure 5). However, the recreational fishery harvests larger dolphin than the commercial fishery (Figure 3; Figure 5); the maximum length of dolphin sampled from the recreational fishery was 67.9 inches fork length in 2010, compared to a maximum length of 59.8 inches fork length by the commercial fishery in 2021 (Table 3; Figure 5).

Fishery-Independent Monitoring

Currently, NCDMF does not have any fishery-independent sampling programs that target or catch dolphin in great numbers.

RESEARCH NEEDS

The following are research and management needs as determined by the council and outlined in the FMPs for pelagic Sargassum habitat and the dolphin/wahoo fishery (SAFMC 2002; SAFMC 2003).

Essential Fish Habitat research needs for dolphin in order of priority from highest to lowest:

- What is the areal and seasonal abundance of pelagic Sargassum off the southeast U.S.?
- Develop methodologies to remotely assess Sargassum using aerial or satellite technologies (e.g., Synthetic Aperture Radar).
- What is the relative importance of pelagic Sargassum weedlines and oceanic fronts for early life stages of dolphin?
- Are there differences in dolphin abundance, growth rate, and mortality?
- What is the age structure of all fishes that utilize pelagic Sargassum habitat as a nursery and how does it compare to the age structure of recruits to pelagic and benthic habitats?
- Is pelagic Sargassum mariculture feasible?
- Determine the species composition and age structure of species associated with pelagic Sargassum when it occurs deeper in the water column.
- Additional research on the dependencies of pelagic Sargassum productivity on the marine species using it as habitat.
- Quantify the contribution of nutrients to deepwater benthic habitat by pelagic Sargassum.
- Studies should be performed on the abundance, seasonality, life cycle, and reproductive strategies of Sargassum and the role this species plays in the marine environment, not only as an essential fish habitat, but as a unique pelagic algae.
- Research to determine impacts on the Sargassum community, as well as the individual species of this community that are associated with, and/or dependent on, pelagic Sargassum. Human induced (tanker oil discharge; trash) and natural threats (storm events) to Sargassum need to be researched for the purpose of protecting and conserving this natural resource.
- Develop cooperative research partnerships between the Council, NOAA Fisheries Protected Resources Division, and state agencies since many of the needs to a) research pelagic Sargassum, and b) protect and conserve pelagic Sargassum habitat, are the same for both managed fish species and listed sea turtles.
- Direct specific research to further address the association between pelagic Sargassum habitat and post-hatchling sea turtles.

Biological research needs for dolphin in order of priority from highest to lowest:

- In the short-term, effort should be directed at examining all existing seasonality (effort and landings), mean size, and life history data for dolphin from the northern area.
- Additional data are needed to develop and/or improve estimates of growth, fecundity, etc.
- There are limited social and economic data available. Additional data need to be obtained and evaluated to better understand the implications of fishery management options.
- Trophic data should be considered in support of an ecosystem management approach.
- Essential fish habitats for dolphin and wahoo need to be identified.
- An overall design should be developed for future tagging work. In addition, existing tagging databases should be examined.
- Long-term work should continue and expand on current research investigating genetic variability of dolphin populations in the western central Atlantic.
- Observer programs should place observers on longline trips directed on dolphin. Catch and bycatch characterization, condition released (alive or dead), etc. should be collected. Observers could also be used to collect bio profile data (size, sex, hard parts for aging, etc.).
- High levels of uncertainty in inter-annual variation in abundance of dolphin should be investigated through an examination of oceanographic and other environmental factors.
- Release mortality should be investigated as a part of the evaluation of the effectiveness of current minimum size limits in the dolphin fishery.
- Establish a list serve for dolphin and wahoo which would facilitate research and the exchange of information.

MANAGEMENT STRATEGY

In North Carolina, dolphin is included in the North Carolina Fishery Management Plan for Interjurisdictional Fisheries, which defers to management under the South Atlantic Fishery Management Council Fishery Management Plan requirements. The South Atlantic Fishery Management Council approved a Fishery Management Plan for dolphin in 2004 and it is currently managed under Amendment 5 (SAFMC 2013), Amendment 7 (SAFMC 2015a), Amendment 8 (SAFMC 2015b), Amendment 12 (SAFMC 2020), Amendment 10 (SAFMC 2021) and Regulatory Amendment 1 (SAFMC 2016).

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TABLES

Table 1: Recreational harvest (number of fish landed and weight in pounds) and releases (number of fish) and commercial harvest (weight in pounds) of dolphin from North Carolina, 1986–2021.

| Year | Recreational | | Commercial | | Total Weight Landed (lb) |
|------|------------------|--------------------|-----------------------|-----------------------|-----------------------------|
| | Number Landed | Number Released | Weight Landed (lb) | Weight Landed (lb) | |
| 1986 | 49,810 | 589 | 478,136 | 35,923 | 514,059 |
| 1987 | 92,582 | 79 | 489,338 | 70,516 | 559,854 |
| 1988 | 81,487 | 31,103 | 205,599 | 56,098 | 261,697 |
| 1989 | 231,953 | 1,696 | 1,653,574 | 98,899 | 1,752,473 |
| 1990 | 209,476 | 1,452 | 986,307 | 96,207 | 1,082,514 |
| 1991 | 254,975 | 6,565 | 1,298,933 | 140,837 | 1,439,770 |
| 1992 | 167,690 | 6,936 | 927,165 | 72,119 | 999,284 |
| 1993 | 291,297 | 3,190 | 1,527,078 | 149,043 | 1,676,121 |
| 1994 | 268,417 | 9,402 | 1,791,880 | 160,742 | 1,952,622 |
| 1995 | 294,100 | 9,620 | 2,324,560 | 354,188 | 2,678,748 |
| 1996 | 213,861 | 2,154 | 1,514,866 | 128,586 | 1,643,452 |
| 1997 | 372,989 | 6,320 | 3,400,820 | 229,791 | 3,630,611 |
| 1998 | 241,733 | 9,249 | 1,792,198 | 149,990 | 1,942,188 |
| 1999 | 395,167 | 10,406 | 3,280,273 | 209,488 | 3,489,761 |
| 2000 | 516,491 | 17,396 | 4,631,849 | 197,259 | 4,829,108 |
| 2001 | 344,865 | 4,781 | 4,669,172 | 160,546 | 4,829,718 |
| 2002 | 400,736 | 3,699 | 4,853,768 | 168,429 | 5,022,197 |
| 2003 | 245,651 | 13,985 | 3,029,205 | 186,262 | 3,215,467 |
| 2004 | 323,140 | 6,905 | 2,445,482 | 255,805 | 2,701,287 |
| 2005 | 634,260 | 3,264 | 5,664,028 | 139,761 | 5,803,789 |
| 2006 | 551,924 | 32,911 | 4,300,459 | 159,452 | 4,459,911 |
| 2007 | 591,835 | 6,908 | 5,729,879 | 369,472 | 6,099,351 |
| 2008 | 362,023 | 2,393 | 3,227,899 | 289,548 | 3,517,447 |
| 2009 | 595,967 | 4,480 | 6,380,552 | 611,962 | 6,992,514 |
| 2010 | 615,081 | 5,759 | 3,754,430 | 239,551 | 3,993,981 |
| 2011 | 638,543 | 16,217 | 4,950,235 | 94,210 | 5,044,445 |
| 2012 | 426,877 | 4,800 | 3,335,644 | 249,020 | 3,584,664 |
| 2013 | 322,769 | 5,315 | 2,277,519 | 178,035 | 2,455,554 |
| 2014 | 403,203 | 6,731 | 2,933,166 | 422,496 | 3,355,662 |
| 2015 | 740,023 | 73,872 | 5,610,008 | 320,961 | 5,930,969 |
| 2016 | 480,860 | 2,520 | 5,099,647 | 356,061 | 5,455,708 |
| 2017 | 279,932 | 3,035 | 2,223,509 | 198,038 | 2,421,547 |
| 2018 | 495,435 | 27,959 | 3,318,532 | 144,660 | 3,463,192 |
| 2019 | 458,086 | 35,286 | 3,147,384 | 208,385 | 3,355,769 |
| 2020 | 262,372 | 26,902 | 2,149,038 | 51,994 | 2,201,032 |
| 2021 | 268,012 | 25,108 | 1,945,342 | 26,112 | 1,971,454 |
| Mean | 364,545 | 11,916 | 2,981,874 | 193,901 | 3,175,776 |

Table 2. Total number of awarded citations for dolphin (>35 pounds landed) annually from the North Carolina Saltwater Fishing Tournament, 1991–2021.

| Year | Total Citations |
|------|-----------------|
| 1991 | 191 |
| 1992 | 266 |
| 1993 | 221 |
| 1994 | 334 |
| 1995 | 354 |
| 1996 | 248 |
| 1997 | 262 |
| 1998 | 412 |
| 1999 | 249 |
| 2000 | 315 |
| 2001 | 457 |
| 2002 | 409 |
| 2003 | 409 |
| 2004 | 155 |
| 2005 | 164 |
| 2006 | 202 |
| 2007 | 218 |
| 2008 | 426 |
| 2009 | 209 |
| 2010 | 157 |
| 2011 | 113 |
| 2012 | 147 |
| 2013 | 284 |
| 2014 | 273 |
| 2015 | 171 |
| 2016 | 124 |
| 2017 | 115 |
| 2018 | 125 |
| 2019 | 181 |
| 2020 | 94 |
| 2021 | 68 |

Table 3. Mean, minimum, and maximum lengths (fork length, inches) of dolphin collected from the commercial and recreational fisheries, 1986–2021.

| Year | Commercial | | | | Recreational | | | |
|------|-------------|----------------|----------------|-----------------------|--------------|----------------|----------------|-----------------------|
| | Mean Length | Minimum Length | Maximum Length | Total Number Measured | Mean Length | Minimum Length | Maximum Length | Total Number Measured |
| 1986 | 26.9 | 16.1 | 45.3 | 46 | 28.7 | 13.8 | 47.8 | 101 |
| 1987 | 23.4 | 5.9 | 50.4 | 113 | 22.8 | 7.1 | 50.4 | 1,038 |
| 1988 | 24.4 | 14.8 | 43.3 | 104 | 23.8 | 12.4 | 52.0 | 691 |
| 1989 | 25.4 | 16.1 | 47.2 | 229 | 25.3 | 13.4 | 65.7 | 1,581 |
| 1990 | 23.9 | 13.0 | 49.6 | 201 | 23.1 | 13.8 | 60.0 | 1,956 |
| 1991 | 28.9 | 16.1 | 47.2 | 99 | 23.0 | 8.7 | 49.2 | 2,468 |
| 1992 | 32.6 | 18.1 | 47.6 | 30 | 22.7 | 7.5 | 55.9 | 1,721 |
| 1993 | 24.9 | 15.7 | 43.9 | 154 | 22.9 | 12.5 | 57.0 | 2,796 |
| 1994 | 27.7 | 16.1 | 50.6 | 136 | 25.5 | 11.0 | 59.1 | 4,469 |
| 1995 | 28.5 | 17.5 | 48.4 | 156 | 27.4 | 11.0 | 62.0 | 3,929 |
| 1996 | 26.1 | 17.5 | 42.1 | 57 | 26.3 | 12.6 | 59.0 | 2,873 |
| 1997 | 29.1 | 16.1 | 48.0 | 30 | 28.8 | 13.8 | 65.7 | 3,250 |
| 1998 | 23.6 | 15.0 | 46.5 | 143 | 27.0 | 9.4 | 60.0 | 3,287 |
| 1999 | 33.0 | 13.6 | 53.1 | 454 | 28.3 | 7.9 | 51.3 | 2,886 |
| 2000 | 26.4 | 14.6 | 48.8 | 208 | 28.3 | 15.9 | 58.0 | 3,740 |
| 2001 | 26.5 | 14.6 | 45.7 | 93 | 31.9 | 10.9 | 58.2 | 2,617 |
| 2002 | 25.8 | 15.7 | 52.8 | 100 | 30.5 | 15.7 | 58.0 | 3,538 |
| 2003 | 27.5 | 15.7 | 48.8 | 190 | 31.9 | 13.9 | 58.0 | 1,185 |
| 2004 | 25.2 | 15.6 | 47.2 | 146 | 27.6 | 18.2 | 48.6 | 1,341 |
| 2005 | 25.7 | 16.5 | 44.9 | 229 | 29.2 | 16.9 | 49.0 | 1,834 |
| 2006 | 27.9 | 16.8 | 52.8 | 172 | 27.8 | 11.8 | 47.8 | 1,659 |
| 2007 | 29.9 | 13.7 | 43.2 | 232 | 30.4 | 17.0 | 55.3 | 1,662 |
| 2008 | 26.2 | 16.3 | 44.7 | 231 | 29.2 | 12.2 | 55.3 | 1,759 |
| 2009 | 32.1 | 5.5 | 51.0 | 555 | 32.0 | 15.4 | 50.8 | 1,963 |
| 2010 | 24.7 | 13.6 | 43.9 | 451 | 25.2 | 15.2 | 67.9 | 1,532 |
| 2011 | 26.2 | 16.1 | 44.1 | 269 | 27.7 | 11.1 | 51.0 | 2,022 |
| 2012 | 29.8 | 16.9 | 49.0 | 579 | 28.3 | 15.0 | 53.5 | 1,918 |
| 2013 | 27.6 | 18.8 | 56.7 | 176 | 26.5 | 11.8 | 57.8 | 601 |
| 2014 | 31.0 | 15.4 | 53.2 | 339 | 27.0 | 10.6 | 51.7 | 896 |
| 2015 | 32.3 | 19.6 | 53.5 | 78 | 27.0 | 11.3 | 52.1 | 956 |
| 2016 | 33.1 | 18.2 | 40.7 | 125 | 31.1 | 7.5 | 52.2 | 1,152 |
| 2017 | 25.0 | 16.9 | 37.3 | 161 | 28.0 | 12.8 | 47.4 | 722 |
| 2018 | 28.8 | 12.0 | 47.2 | 117 | 25.6 | 13.1 | 57.2 | 1,313 |
| 2019 | 29.3 | 14.1 | 45.3 | 143 | 25.7 | 10.3 | 58.1 | 877 |
| 2020 | 26.0 | 17.6 | 43.5 | 64 | 28.0 | 13.1 | 55.3 | 1,092 |
| 2021 | 32.1 | 15.7 | 59.8 | 194 | 26.1 | 13.7 | 55.1 | 396 |

FIGURES

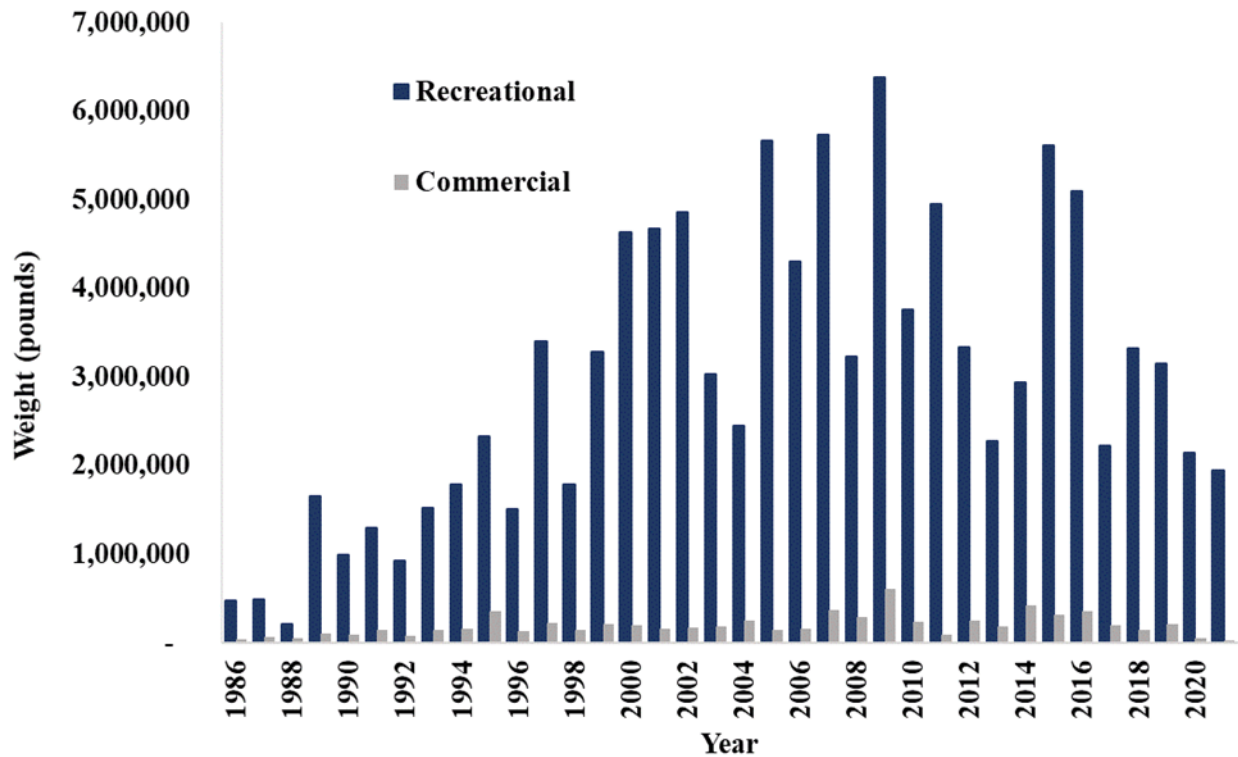


Figure 1. Annual commercial and recreational landings in pounds of dolphin in North Carolina, 1986–2021.

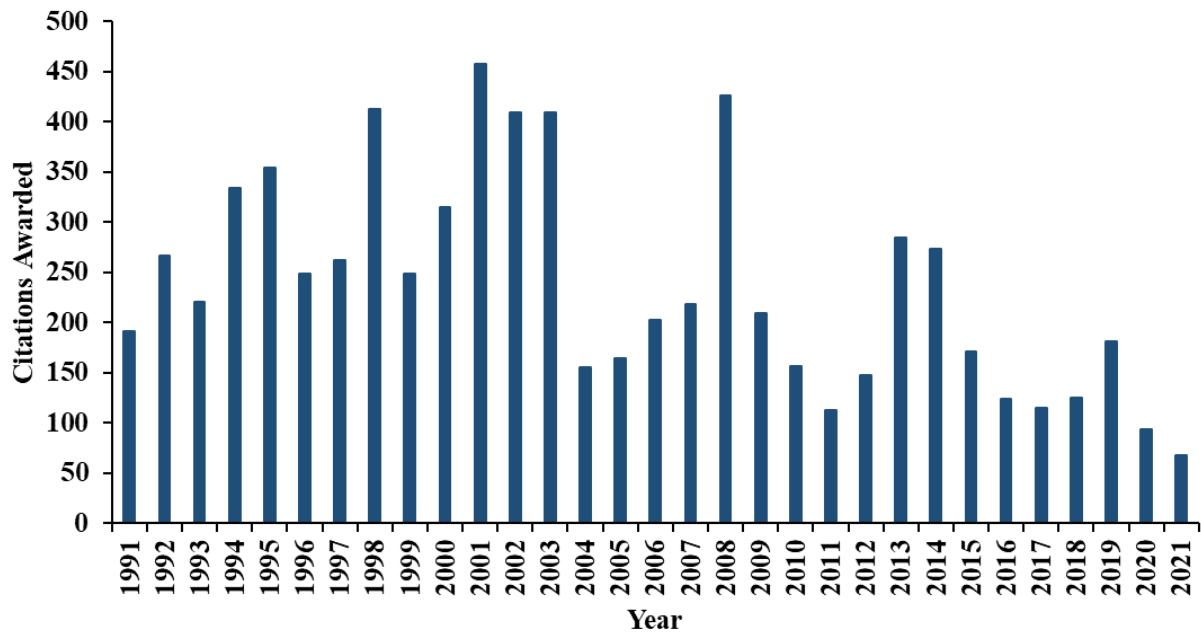


Figure 2. Total number of awarded citations for dolphin (>35 pounds landed) annual from the North Carolina Saltwater Fishing Tournament, 1991–2021.

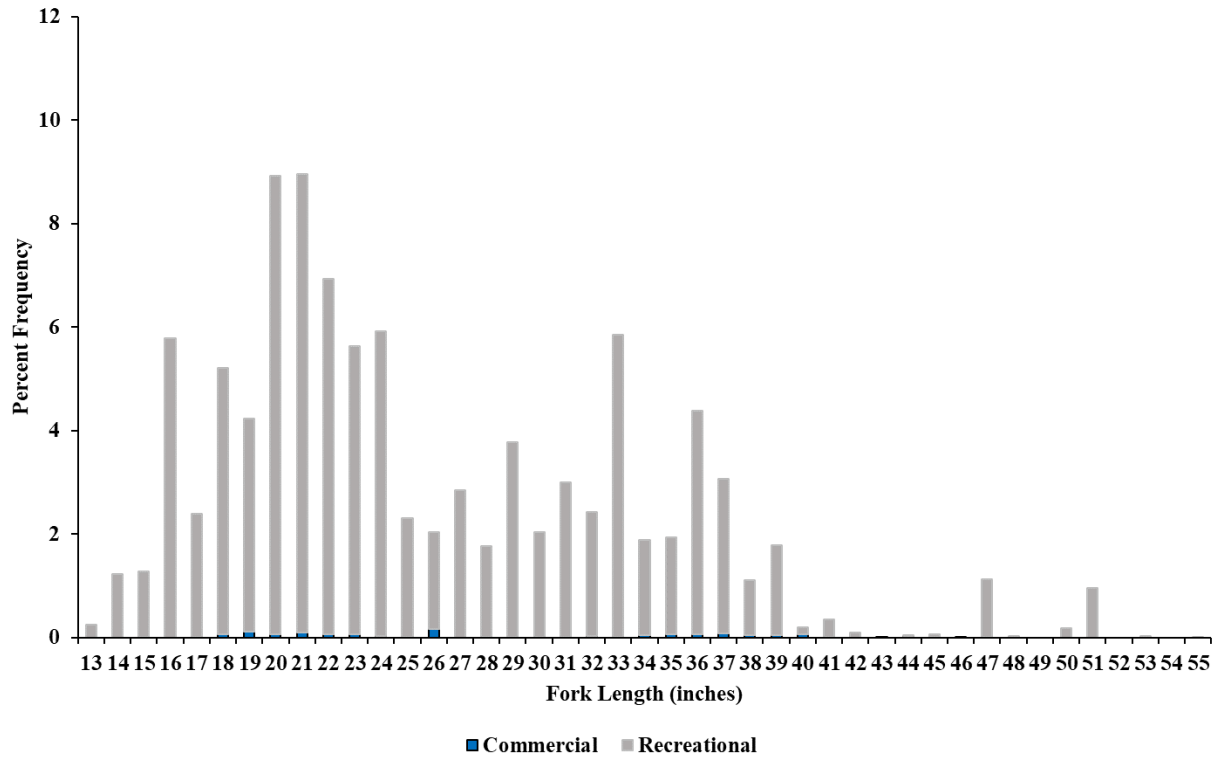


Figure 3. Commercial and recreational length frequency distribution for dolphin harvested in 2021.

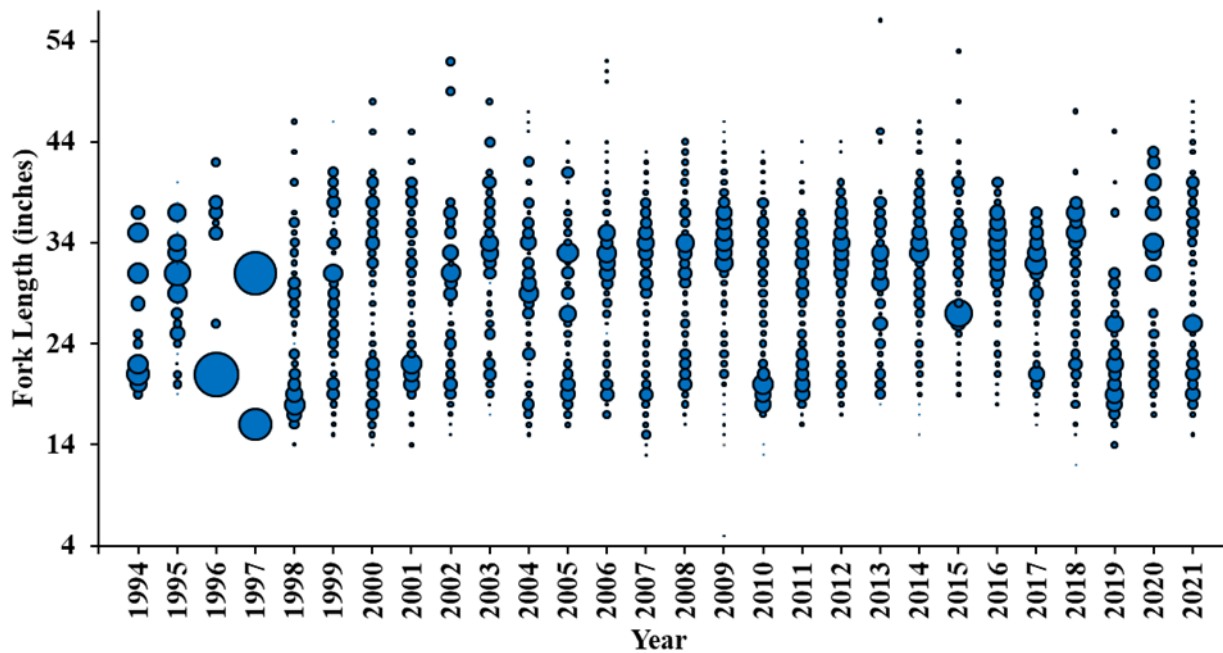


Figure 4. Commercial length frequency (fork length, inches) of dolphin harvested from 1994 to 2021. Bubbles represent fish harvested at length and the size of the bubble is equal to the proportion of fish at that length in that year.

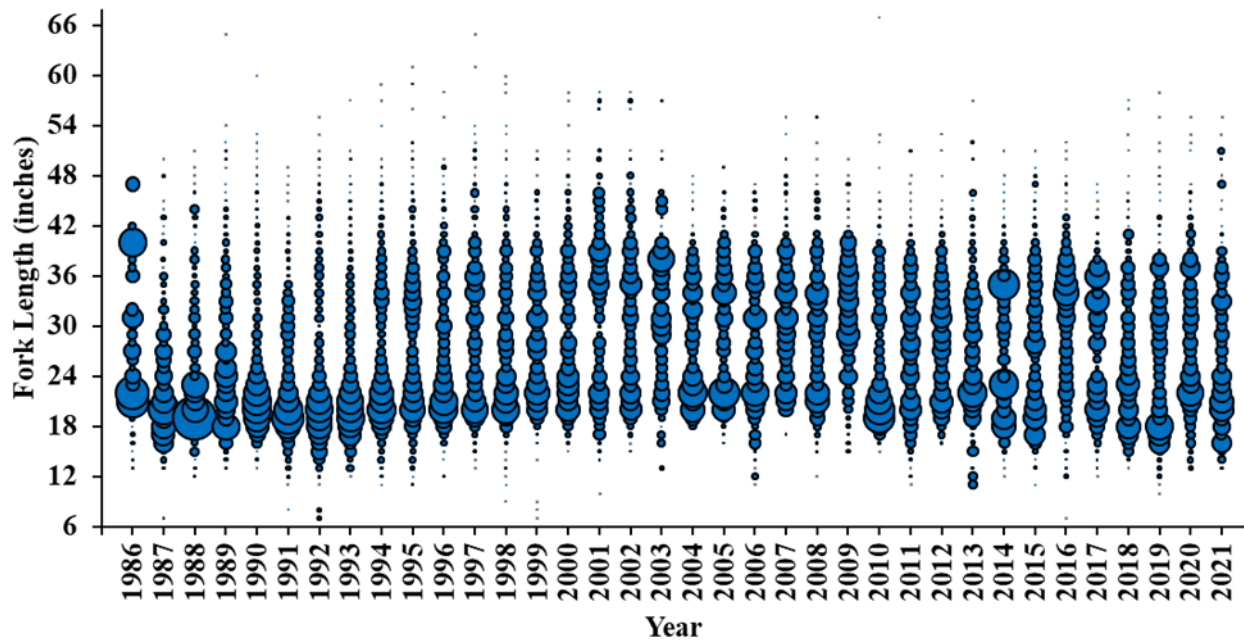


Figure 5. Recreational length frequency (fork length, inches) of dolphin harvested from 1986 to 2021. Bubbles represent fish harvested at length and the size of the bubble is equal to the proportion of fish at that length in that year.