

ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR TAUTOG
(Tautoga onitis)

2017 FISHING YEAR



Prepared by the Plan Review Team

Approved by the Tautog Management
Board October 2018

**REVIEW OF THE
INTERSTATE FISHERY MANAGEMENT
PLAN FOR TAUTOG (*Tautoga onitis*)
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Management Summary

<u>Management Documents:</u>	Fishery Management Plan - March 1996 Addendum I to FMP (May 1997) Addendum II to FMP (November 1999) Addendum III to FMP (February 2002) Addendum IV to FMP (January 2007) Addendum V to FMP (August 2007) Addendum VI to FMP (March 2011, revised March 2012) Amendment 1 to FMP (October 2017)
<u>Management Unit:</u>	US state waters from Massachusetts through Virginia ¹ .
<u>Declared Interest:</u>	Massachusetts Rhode Island Connecticut New York New Jersey Delaware Maryland Virginia National Marine Fisheries Service U.S. Fish & Wildlife Service
<u>Active Boards/Committees:</u>	Tautog Management Board (Board) Tautog Plan Development Team (PDT) Tautog Plan Review Team (PRT) Tautog Technical Committee (TC) Tautog Stock Assessment Subcommittee (SAS) Tautog Advisory Panel (AP)
<u>Stock Assessments:</u>	Benchmark: 1999, 2005, 2015 Update: 2011 (revised in 2012), 2016

¹ North Carolina was originally included in the management unit, but as of 2017 was removed due to insignificant landings. North Carolina's landings will continue to be monitored.

I. Status of Fishery Management Plan

Fishery Management Plan for Tautog

The original FMP responded to concerns about the vulnerability of tautog to overfishing and increasing fishing pressure in the early 1990s. It established goals and objectives for tautog management, and adopted a fishing mortality rate (F) target of 0.15 to rebuild the stocks and prevent overfishing; however, an interim target of 0.24 was applied for two years (1997–1998). States were required to implement state-specific, Board-approved plans to reduce F from the coastwide average of 0.58 (i.e., a 55% reduction), or an alternative state-specific F, if it could be demonstrated as equivalent. Recreational and commercial minimum size limits of 13" in 1997 and 14" beginning in 1998 were required. Tautog pots and traps were also required to have degradable fasteners on one panel or door.

Addendum I

Addendum I modified the FMP's compliance schedule to allow all states until April 1, 1998 to implement management measures to reach the interim F target. Several states were having difficulty determining a state-specific F to meet the original compliance schedule due to data deficiencies. In addition, the compliance schedule implemented the interim F target one year earlier in the area north of Delaware Bay (April 1, 1997) than further to the south (April 1, 1998). The addendum also delayed the implementation of management measures to achieve the permanent F target from April 1, 1999 to April 1, 2000. Finally, the Addendum included *de minimis* requirements and corrected several typographical errors in the FMP.

Addendum II

Addendum II further extended the compliance schedule to achieve the permanent F target until April 1, 2002 because the effects of the regulations to achieve the interim F target were uncertain. It also listed four issues to be considered in subsequent revisions of the FMP: (1) development of alternative F targets that will allow states to quantify harvest reductions associated with a variety of management approaches, (2) clarification of the F targets to be met by sector or overall state program, (3) monitoring requirements to improve fisheries and biological data collection, and (4) data requirements to analyze management options by fishing modes within commercial and recreational fisheries.

Addendum III and Technical Addendum I

Addendum III addressed the four issues listed in Addendum II. It adopted a new F target based on achieving 40% of the spawning stock biomass ($F_{40\%SSB}$), which was estimated at 0.29 (compared to the coastwide average F estimate of 0.41). The addendum required states to maintain current or more restrictive measures for 2002 and implement measures to achieve the new F target—a 48% reduction through restrictions in the recreational fishery only—by April 1, 2003. It also updated information on tautog habitat and established monitoring requirements to support stock assessments. Technical Addendum 1 corrected a typographical error in Addendum III.

Addendum IV

Addendum IV established SSB target and threshold reference points based on a benchmark stock assessment completed in 2005. The target was set as the average SSB over 1982–1991, and the threshold at 75% of this value. It also set a new F target of 0.20 to initiate rebuilding. States were required to implement recreational management programs to achieve a 28.6% reduction in F relative to 2005 (and maintain existing commercial management programs) by January 1, 2008.

Addendum V

As individual states developed management proposals to comply with Addendum IV's mandated reduction in fishing mortality, it became apparent that commercial harvest of tautog had grown in proportion to the recreational fishery in some states. The Board approved Addendum V to give states flexibility for implementing reductions in their recreational *and/or* commercial fisheries to reach the fishing mortality target rate of $F = 0.20$ established in Addendum IV by January 1, 2008.

Addendum VI

Based on the 2011 stock assessment update indicating that tautog were still overfished and experiencing overfishing, Addendum VI reduced the F target to 0.15 to rebuild the stock. States were required to implement Board-approved regulations in their commercial and/or recreational fisheries to reduce harvest by 39%. The addendum also allowed for regional considerations if a state or group of states could demonstrate that the local F is below the rates indicated in the stock assessment update.

Amendment 1

Amendment 1 replaces the original FMP, with an implementation date of April 1, 2018 for most measures. Major revisions to the FMP include: new goals and objectives, establishment of four tautog stocks for regional recreational and commercial management, and creation of a commercial harvest tagging program (implementation in 2019).

Goals:

- To sustainably manage tautog over the long-term using regional differences in biology and fishery characteristics as the basis for management.
- To promote the conservation and enhancement of structured habitat to meet the needs of all stages of tautog's life cycle.

Objectives:

- To develop and implement management strategies to rebuild tautog stocks to sustainable levels (reduce fishing mortality to the target and restore spawning stock biomass to the target), while considering ecological and socio-economic impacts.
- To adopt compatible management measures among states within a regional management unit.
- To encourage compatible regulations between the states and the EEZ, which includes enacting management recommendations that apply to fish landed in each state (i.e., regulations apply to fish caught both inside and outside of state waters).

- To identify important habitat and environmental quality factors that support the long-term maintenance and productivity of sustainable tautog populations throughout their range.
- To promote cooperative interstate biological, social, and economic research, monitoring and law enforcement.
- To encourage sufficient monitoring of the resource and collection of additional data, particularly in the southern portion of the species range, that are necessary for development of effective long-term management strategies and evaluation of the management program.
- To work with law enforcement to minimize factors contributing to illegal harvest.

Regional Management: Based on the 2016 regional stock assessment, Amendment 1 delineates the stock into four regions due to differences in biology and fishery characteristics: Massachusetts - Rhode Island (MARI); Long Island Sound (LIS); New Jersey - New York Bight (NJ-NYB); and Delaware - Maryland - Virginia (DelMarVa). The four regions are required to implement measures to achieve the regional fishing mortality target with at least a 50% probability.

The 2016 assessment found that all regions except MARI were overfished, and overfishing was occurring in the LIS and NJ-NYB regions in 2015. As such, Amendment 1 requires the LIS region to reduce harvest by at least 20.3%, and the NJ-NYB region to reduce harvest by at least 2%. The MARI and DelMarVa regions were not required to reduce harvest, but established regional measures.

Commercial Harvest Tagging Program: Amendment 1 also establishes a commercial harvest tagging program to address an illegal, unreported and undocumented fishery. Implementation of the program is tentatively scheduled for 2019.

II. Status of the Stocks

Current stock status is based on the 2016 stock assessment update. The assessment evaluates each of the four regions—MARI, LIS, NJ–NYB, and DelMarVa—separately using the ASAP statistical catch-at-age model with landings and index data through 2015. The assessment update indicated that all regions except MARI were overfished in 2015. It also found overfishing was occurring in the LIS and NJ-NYB regions in 2015. Overfishing was not occurring in the MARI nor DelMarVa regions. F was at the target in the DelMarVa region. The current overfishing and overfished definitions for management use are shown in Table 1, and spawning stock biomass (SSB) for each region relative to the respective targets and thresholds are shown in Figures 1-4. It is important to note that the status determinations were made using spawning potential ratio (SPR) reference points for the MARI, NJ-NYB and DelMarVa regions, and maximum sustainable yield (MSY) reference points for the LIS region.

III. Status of Assessment Advice

The current reference points for this fishery are based on a regional stock assessment update that includes data through 2015. The peer review panel in the 2005 and 2015 benchmark stock assessments advised a regional approach for tautog because of the potential for sub-stock structure; this species does not appear to make north-south migrations. The 2015 benchmark stock assessment peer review panel also endorsed the use of estimates from the ASAP regional model and supported use of the new reference points in conjunction with a regional management approach. A regional approach with new reference points has been adopted for management use through Amendment 1. The next assessment (update or benchmark) has not been scheduled.

IV. Status of the Fishery

Total Harvest

Between 1981 and 2017², total coastwide tautog harvest (recreational + commercial) peaked at 17.8 million pounds in 1986. Harvest has since significantly declined, even before state regulations were implemented to restrict them. Total harvest during the ASMFC managed period (1997–2017) has averaged 3.3 million pounds per year (Figure 5, Table 2).

Recreational Harvest³

Tautog is predominantly taken by the recreational fishery: 90% on average, by weight (Table 2). Coastwide, anglers harvested a historic high of 16.9 million pounds of tautog in 1986 (Figure 5); however, 1986 was a unique year in which recreational harvest in Massachusetts was unusually high. Since then, harvest has generally declined. The smallest harvests occurred in both 1998 and 2011, at 1.5 million pounds each. Recreational harvest decreased from 2.7 million pounds in 2016 to 1.8 million pounds in 2017. Most recreational harvest occurs in Wave 6 (November–December) (Figure 6). At the state level, Connecticut and New Jersey anglers harvested the most tautog in 2017 (Tables 4 and 5).

Recreational live discards have generally increased relative to harvest over the time series. Prior to the FMP's implementation in 1996, discards were usually less than harvest, but since then the estimated number of fish discarded annually has been several times greater than the harvested number (Table 4). In 2017, live discards were seven times the estimated harvest. A discard mortality rate of 2.5% is assumed for the recreational tautog fishery, resulting in an estimated 91,257 recreational dead discards in 2017. This equates to 18.2% of the recreational harvest.

² Systematic recreational data collection for tautog began in 1981, while commercial data exists back to 1950.

³ All recreational data included in this report are derived from MRIP data prior to recalibration accounting for the new Fishing Effort Survey (FES) and recent design changes to the Access Point Angler Intercept Survey. The recalibrated MRIP estimates will be incorporated into an operational assessment in 2019 for management use.

Commercial Landings

Historically, tautog was considered a “trash fish” until the late 1970s, when demand increased and a directed commercial fishery developed. Landings quickly rose, peaking in 1987 at nearly 1.2 million pounds, then rapidly began to decline. In 1992, states began to implement commercial regulations, which contributed to a decline in landings (Figure 7, Table 2). The value (dollars per pound) for tautog has increased since the late 1970s, coinciding with the increase of landings. In 2017, the coastwide average value reached \$3.65 per pound (Figure 7).

Commercial landings accounted for 15% of total coastwide harvest in 2017. In some states commercial landings were more significant, e.g., 34% of New York’s total 2017 harvest (Table 3). New York also had the most commercial landings of tautog in 2017, with Massachusetts landing the second greatest amount (Table 6). Data on commercial discards are not available.

V. Status of Research and Monitoring

Addendum III requires all states to collect the following data to continue support of a coast-wide stock assessment: commercial and recreational catch estimates, and 200 age and length samples per state, within the range of lengths commonly caught by the fisheries⁴. Table 9 lists the number and source of samples collected by states in 2017.

Ongoing fishery-independent and fishery-dependent monitoring programs performed by each state are summarized in Tables 10 and 11, respectively. Details of monitoring results are found in the state compliance reports.

VI. Status of Management Measures and Issues

Amendment 1 to the Tautog Fishery Management Plan was approved by the Board in October 2017. All measures within the plan, including regional management programs, have been implemented as of January 2018 with the exception of the commercial tagging program. The commercial tagging program is currently being developed by state and ASMFC staff and has a tentative implementation date in 2019.

VII. Implementation of FMP Compliance Requirements

A. Submission of Compliance Report

All states in the tautog management unit submitted state compliance reports for the 2017 fishing year.

⁴ Addendum III also required a suitable time series of fisheries independent indices of abundance as determined by the Tautog Technical Committee; however the TC has not defined this and as such there are no fishery independent monitoring requirements.

B. De Minimis Status Requests

A state may apply for *de minimis* status with regards to its commercial fishery. To qualify for *de minimis* status a state must prove that its commercial landings in the most recent year for which data are available did not exceed 10,000 pounds or 1% of the coastwide⁵ commercial landings, whichever is greater. States must request *de minimis* status each year, and requests for *de minimis* status will be reviewed by the PRT as part of the annual FMP review process.

If *de minimis* status is granted, the *de minimis* state is required to implement the commercial minimum size provisions, the pot and trap degradable fastener provisions, and regulations consistent with those in the recreational fishery (including possession limits and seasonal closures). The state must monitor its landings on at least an annual basis. If granted *de minimis* status, a state must continue to collect the required 200 age/length samples. *De minimis* status does not impact a state's compliance requirements in the recreational fishery.

The commercial landings threshold for *de minimis* status for 2017 is 10,000 pounds. The states of Delaware and Maryland have requested and qualify for continued *de minimis status* for the commercial sector. The PRT recommends that the Board approve the states of Delaware and Maryland's requests.

C. Regulatory Requirements: 14" minimum size limit for recreational and commercial fisheries; degradable fasteners on one panel or door in fish pots and traps; and regional management programs to achieve the required regional target F.

State regulations are summarized in Tables 7 and 8. The PRT finds that each state has met the regulatory requirements and recommends the Board find all states in compliance with the regulatory requirements.

D. Biological Sampling Requirements: commercial and recreational catch estimates; and 200 age/length samples (Addendum III)

Most states collected 200 or more age/length samples in 2017 as required by Addendum III (Table 9). Connecticut, New York, and Delaware fell short of the required number of samples, with 75, 96, and 92 samples, respectively. Connecticut relies solely on the Long Island Sound Trawl Survey (LISTS) for tautog age samples, which has encountered fewer tautog in recent years, and cannot conduct additional sampling due to funding and staff limitations. New York noted that efforts to obtain samples from the recreational fishery were hampered by weather, vessels targeting other available species, and because some of the crews were unwilling to give them racks for aging because they were using them as bait. Additionally, rumors of substantial cuts and other unpopular management measures coming to the fishery generally made it

⁵ Amendment 1 changes the *de minimis* requirement for 2018 and beyond such that landings in the most recent year for which data are available cannot exceed 10,000 pounds or 1% of the *regional*, rather than coastwide, commercial landings.

difficult to get cooperation from captains to sample on board. In the commercial fishery, the majority of tautog caught commercially are going to the live market and are therefore not available for collecting age samples. NYS DEC staff had difficulty obtaining samples from fish markets, but was able to get commercial samplers via a contractor who sampled both markets and dockside. However, the agreement with the contractor ended in June and difficulty with renewing the contract prevented DEC from obtaining additional samples via the contractor. Delaware also noted issues with acquiring recreational samples prevented the state from collecting the required number of samples.

The PRT finds that all states met (or tried to meet) the intent of the sampling requirements and recommends the Board find all states in compliance with the sampling requirements of the FMP.

As some states are consistently unable to meet the 200 age/length sample requirement, in 2017 the PRT suggested the required number of samples should be reevaluated. As a result, the Board tasked the TC with evaluating the biological sampling needs to support continued regional stock assessments for tautog, and recommending any revisions to the biological sampling requirements. The TC met in June 2018 to discuss this topic, and is in the process of analyzing available data and gathering additional information before making a recommendation.

VIII. Prioritized Research Needs

The Technical Committee identified the following research recommendations to improve the stock assessment and our understanding of tautog population and fishery dynamics. Research recommendations are organized by topic and level of priority. Research recommendations that should be completed before the next benchmark assessment are underlined. The Technical Committee will update these recommendations as part of the next benchmark stock assessment.

8.1 Fishery-Dependent Priorities

High

- Expand biological sampling of the commercial catch for each gear type over the entire range of the stock (including weight, lengths, age, sex, and discards).
- Continue collecting opercula from the tautog catch as the standard for biological sampling in addition to collecting paired sub-samples of otoliths and opercula.
- Increase catch and discard length sampling from the commercial and recreational fishery for all states from Massachusetts through Virginia.
- Increase collection of effort data for determining commercial and recreational CPUE.

- Increase MRIP sampling levels to improve recreational catch estimates by state and mode. Current sampling levels are high during times of the year when more abundant and popular species are abundant in catches, but much lower in early spring and late fall when tautog catches are more likely.

8.2 Fishery-Independent Priorities

High

- Conduct workshop and pilot studies to design a standardized, multi-state fishery independent survey for tautog along the lines of MARMAP and the lobster ventless trap survey.
- Establish standardized multi-state long-term fisheries-independent surveys to monitor tautog abundance and length-frequency distributions, and to develop YOY indices.
- Enhance collection of age information for smaller fish (<20 cm) to better fill in age-length keys

8.3 Life History, Biological, and Habitat Priorities

Moderate

- Define local and regional movement patterns and site fidelity in the southern part of the species range. This information may provide insight into questions of aggregation versus recruitment to artificial reef locations, and to clarify the need for local and regional assessment.
- Assemble regional reference collections of paired operculum and otolith samples and schedule regular exchanges to maintain and improve the precision of age readings between states that will be pooled in the regional age-length keys.
- Calibrate age readings every year by re-reading a subset of samples from previous years before ageing new samples. States that do not currently assess the precision of their age readings over time should do so by re-ageing a subset of their historical samples.

Low

- Evaluate the potential impacts of climate change on tautog range, life history, and productivity.
- Conduct a tag retention study to improve return rates, particularly in the northern region.
- Define the status (condition and extent) of optimum or suitable juvenile habitats and trends in specific areas important to the species. It is critical to protect these habitats or to stimulate restoration or enhancement, if required.
- Define the specific spawning and pre-spawning aggregating areas and wintering areas of juveniles and adults used by all major local populations, as well as the migration routes used by tautog to get to and from spawning and wintering areas and the criteria or

times of use. This information is required to protect these areas from damage and overuse or excessive exploitation.

- Define larval diets and prey availability requirements. This information can be used as determinants of recruitment success and habitat function status. Information can also be used to support aquaculture ventures with this species.
- Define the role of prey type and availability in local juvenile/adult population dynamics over the species range. This information can explain differences in local abundance, movements, growth, fecundity, etc. Conduct studies in areas where the availability of primary prey, such as blue mussels or crabs, is dependent on annual recruitment, the effect of prey recruitment variability as a factor in tautog movements (to find better prey fields), mortality (greater predation exposure when leaving shelter to forage open bottom), and relationship between reef prey availability/quality on tautog condition/fecundity.
- Define the susceptibility of juveniles to coastal/anthropogenic contamination and resulting effects. This information can explain differences in local abundance, movements, growth, fecundity, and serve to support continued or increased regulation of the inputs of these contaminants and to assess potential damage. Since oil spills seem to be a too frequent coastal impact problem where juvenile tautog live, it may be helpful to conduct specific studies on effects of various fuel oils and typical exposure concentrations, at various seasonal temperatures and salinities. Studies should also be conducted to evaluate the effect of common piling treatment leachates and common antifouling paints on YOY tautog. The synergistic effects of leaked fuel, bilge water, treated pilings, and antifouling paints on tautog health should also be studied.
- Define the source of offshore eggs and larvae (in situ or washed out coastal spawning).
- Confirm that tautog, like cunner, hibernate in the winter, and in what areas and temperature thresholds, for how long, and if there are special habitat requirements during these times that should be protected or conserved from damage or disturbance. This information will aid in understanding behavior variability and harvest availability.

8.4 Management, Law Enforcement, and Socioeconomic Priorities

Moderate

- Collect data to assess the magnitude of illegal harvest of tautog and the efficacy of the tagging program.

Low

- Collect basic sociocultural data on tautog user groups including demographics, location, and aspects of fishing practices such as seasonality.

Figures & Tables

Figure 1. Spawning Stock Biomass targets and thresholds for MARI region.

Source: 2016 ASMFC Tautog Stock Assessment Update.

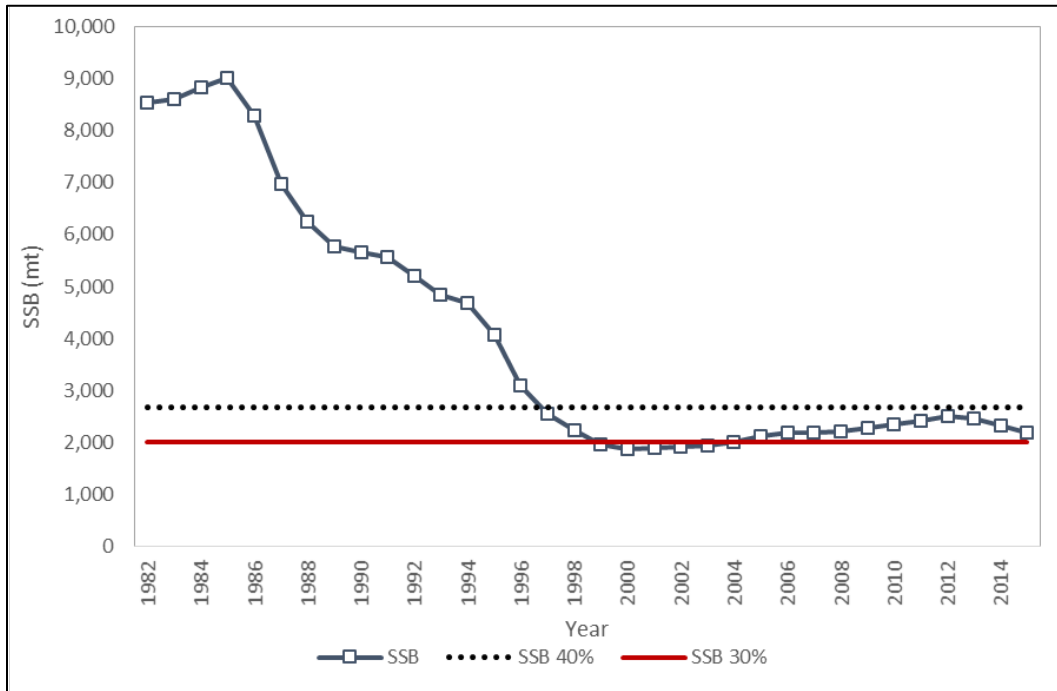


Figure 2. Spawning Stock Biomass targets and thresholds for LIS region.

Source: 2016 ASMFC Tautog Stock Assessment Update.

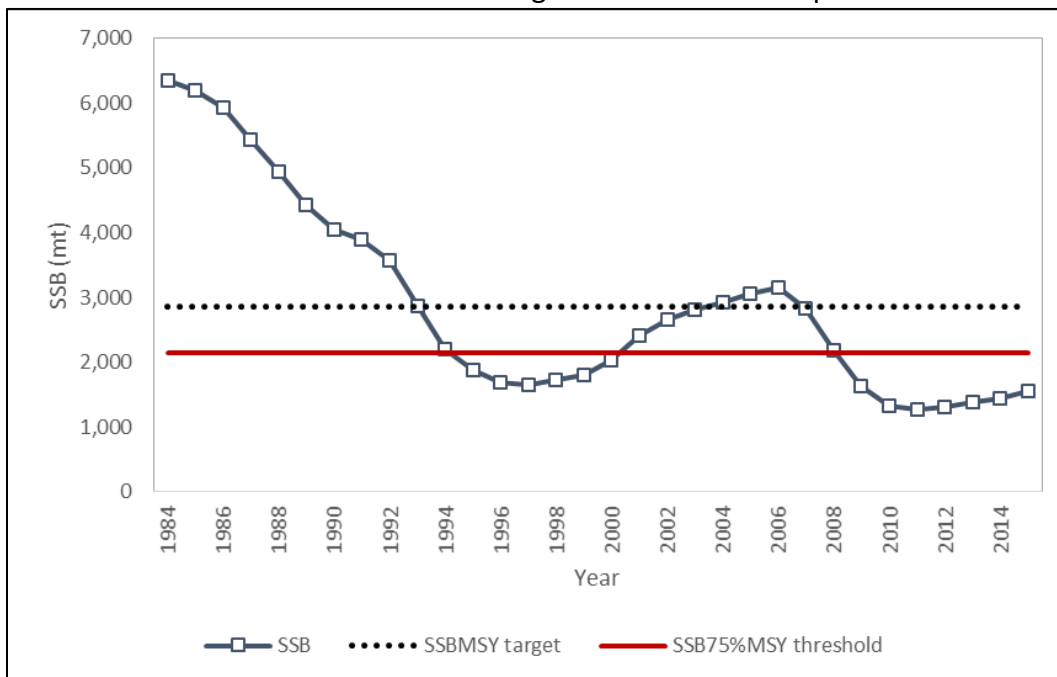


Figure 3. Spawning Stock Biomass targets and thresholds for NJ-NYB region.

Source: 2016 ASMFC Tautog Stock Assessment Update.

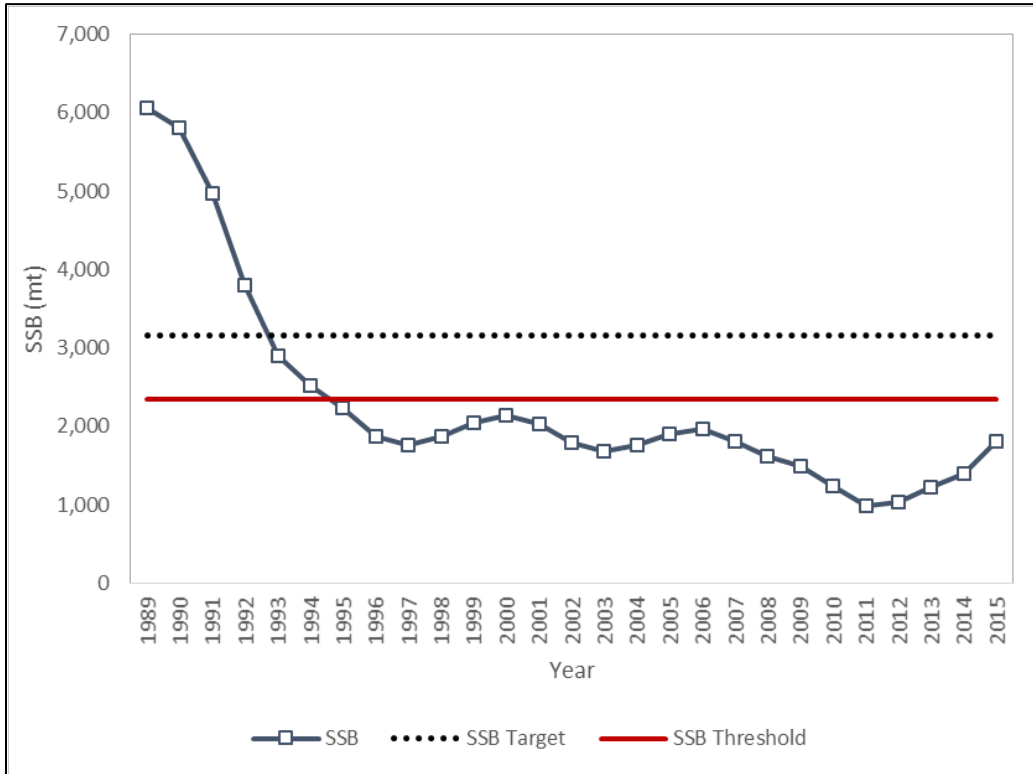


Figure 4. Spawning Stock Biomass targets and thresholds for DMV region.

Source: 2016 ASMFC Tautog Stock Assessment Update.

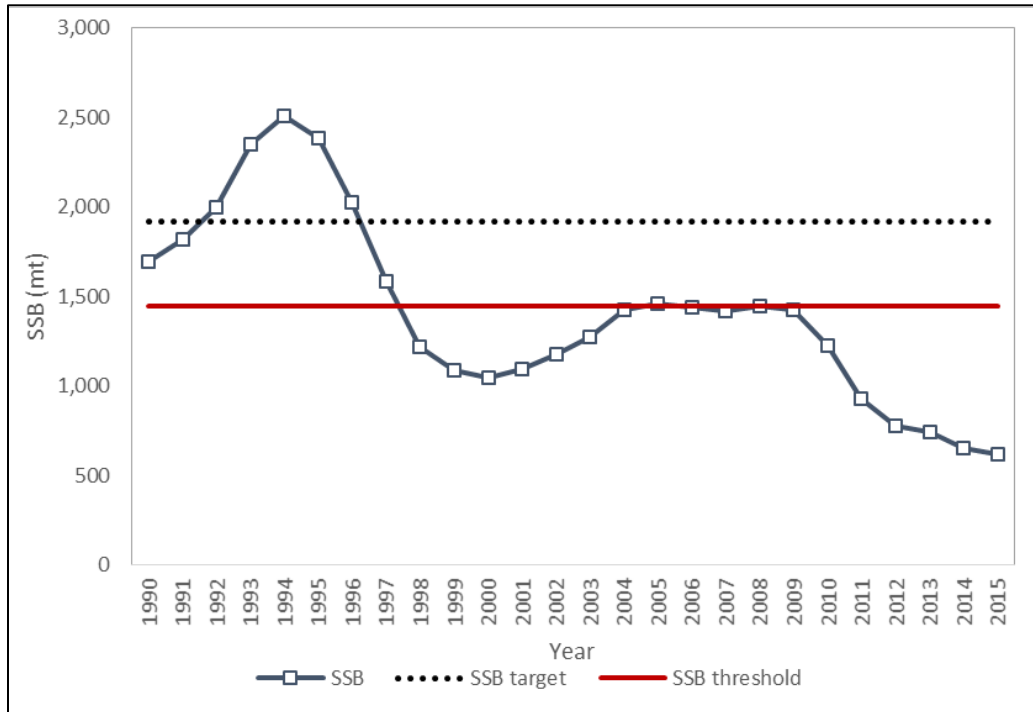


Figure 5. Total tautog harvest (recreational and commercial).
 Source: NMFS, MRIP.

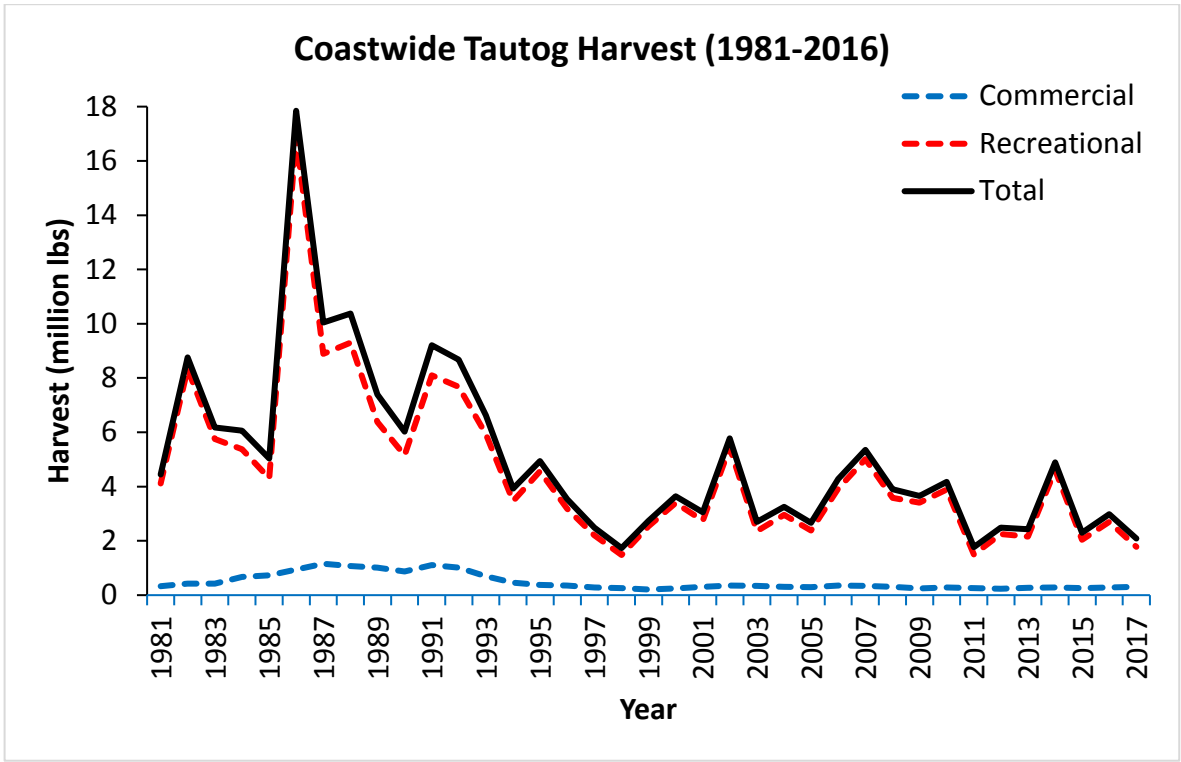


Figure 6. Percent of annual recreational tautog harvest by wave (2015-2017). Source: MRIP.

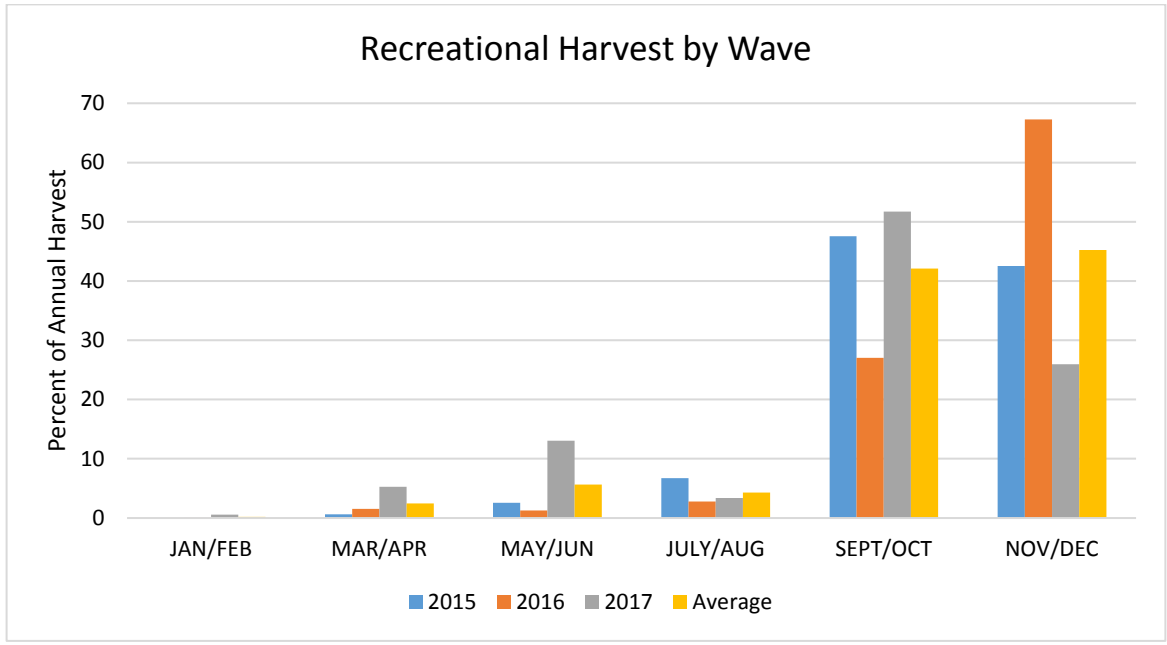


Figure 7. Changes in tautog commercial landings (lbs) and value (\$/lb) over time.
 Source: NMFS. Values unadjusted for inflation.

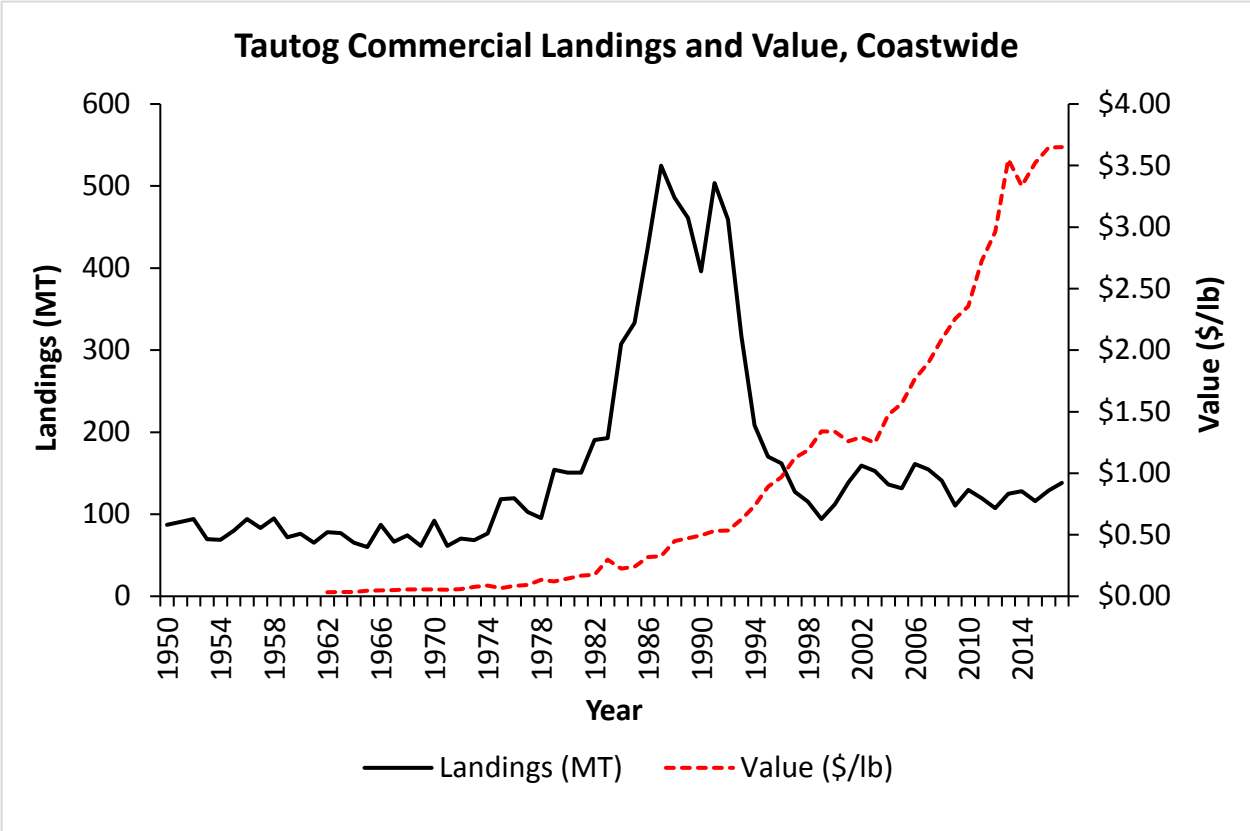


Table 1. Current fishing mortality and biomass targets and thresholds for each region. Source: ASMFC 2016 Tautog Assessment Update.

Region	F_{target}	F_{threshold}	F_{3yravg}	SSB_{target}	SSB_{threshold}	SSB₂₀₁₅	MSY or SPR	Status
MARI	0.28	0.49	0.23	2,684 mt	2,004 mt	2,196 mt	SPR	Not overfished, overfishing not occurring
LIS	0.28	0.49	0.51	2,865 mt	2,148 mt	1,603 mt	MSY	Overfished, overfishing
NJ-NYB	0.20	0.34	0.54	3,154 mt	2,351 mt	1,809 mt	SPR	Overfished, overfishing
DMV	0.16	0.24	0.16	1,919 mt	1,447 mt	621 mt	SPR	Overfished, overfishing not occurring

Table 2. Tautog recreational and commercial landings from 1981–2017, in pounds.

Source: State Compliance Reports, NMFS, and ACCSP Data Warehouse.

Year	Commercial Landings (lbs)	Recreational Harvest, A + B1 (lbs)	Total Harvest (lbs)	% Recreational
1981	331,900	4,115,046	4,446,946	92.5
1982	419,556	8,337,958	8,757,514	95.2
1983	425,519	5,749,538	6,175,057	93.1
1984	677,615	5,381,193	6,058,808	88.8
1985	734,370	4,305,087	5,039,457	85.4
1986	940,806	16,906,397	17,847,203	94.7
1987	1,157,100	8,888,783	10,045,883	88.5
1988	1,070,814	9,301,700	10,372,514	89.7
1989	1,016,431	6,377,752	7,394,183	86.3
1990	873,505	5,156,175	6,029,680	85.5
1991	1,110,111	8,101,441	9,211,552	87.9
1992	1,012,172	7,671,225	8,683,397	88.3
1993	698,440	5,927,020	6,625,460	89.5
1994	459,490	3,468,112	3,927,602	88.3
1995	375,567	4,567,374	4,942,941	92.4
1996	357,434	3,184,901	3,542,335	89.9
1997	280,912	2,204,039	2,484,951	88.7
1998	254,186	1,479,762	1,733,948	85.3
1999	207,981	2,532,690	2,740,671	92.4
2000	247,177	3,398,348	3,645,525	93.2
2001	305,193	2,749,701	3,054,894	90.0
2002	350,820	5,431,145	5,781,965	93.9
2003	336,685	2,357,940	2,694,625	87.5
2004	300,749	2,959,168	3,259,917	90.8
2005	289,984	2,379,790	2,669,774	89.1
2006	355,504	3,923,886	4,279,390	91.7
2007	340,925	5,009,021	5,349,946	93.6
2008	310,940	3,589,422	3,900,362	92.0
2009	243,644	3,408,159	3,651,803	93.3
2010	286,081	3,885,107	4,171,188	93.1
2011	263,241	1,503,076	1,766,317	85.1
2012	236,974	2,248,763	2,485,737	90.5
2013	275,839	2,158,563	2,434,402	88.7
2014	282,624	4,608,251	4,890,875	94.2
2015	255,915	2,043,032	2,298,947	88.9
2016	283,906	2,704,452	2,988,358	90.5
2017	304,600	1,784,869	2,089,468	85.4
Average	477,695	4,589,159	5,066,854	90.1

*Commercial landings do not include data from states that had confidential data (1987 excludes NC; 1999-2003, 2005-2006, 2010-2011, 2013-2014, and 2017 exclude Delaware; and 2011, 2012, and 2014 exclude Maryland).

Table 3. 2017 tautog landings by sector: percent recreational and commercial by weight.

State	Commercial Landings (%)	Recreational (A+B1) (%)
MA	21.2	78.8
RI	18.0	82.0
CT	1.5	98.5
NY	34.3	65.7
NJ	confidential	confidential
DE	confidential	confidential
MD	confidential	confidential
VA	31.1	68.9
NC	0.7	99.3
Coastwide	14.6	85.4

Table 4. Estimated recreational harvest (A+B1) by state and coastwide discards of tautog in number of fish, 1981-2017. Source: MRFSS/MRIP (pre-recalibration), queried July 13, 2018.

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Coastwide Total Harvest	Live Discards	Dead Discards
1981	228,736	233,508	100,308	721,062	132,271	3,457	4,670	236,768	3,072	1,663,852	386,614	9,665
1982	1,051,022	214,938	231,187	646,693	583,550	137,328	35,105	71,599	15,062	2,986,484	292,888	7,322
1983	670,508	245,796	200,676	612,163	344,580	4,350	2,126	579,795	36,549	2,696,543	676,332	16,908
1984	258,256	490,128	287,470	286,077	516,086	28,388	42,835	207,192	NA	2,116,432	647,963	16,199
1985	100,941	115,404	182,318	1,105,234	840,627	62,001	486	91,957	8,252	2,507,220	716,738	17,918
1986	1,980,719	671,592	333,396	1,183,114	2,369,852	141,290	5,476	322,905	12,660	7,021,004	1,104,064	27,602
1987	617,068	130,729	312,430	929,887	1,015,123	99,706	90,523	126,783	3,698	3,325,947	1,406,300	35,158
1988	621,679	207,799	234,198	828,183	564,286	94,491	107,570	368,320	4,462	3,030,988	1,240,696	31,017
1989	250,077	116,506	303,782	562,549	710,958	249,928	34,709	284,477	11,354	2,524,340	1,068,964	26,724
1990	233,444	153,433	75,871	953,622	841,770	61,526	45,467	111,998	3,428	2,480,559	1,241,464	31,037
1991	176,905	291,946	191,137	871,221	1,067,283	128,985	26,770	168,068	6,804	2,929,119	2,256,854	56,421
1992	357,949	193,786	319,221	413,236	1,018,205	68,769	106,255	100,952	5,249	2,583,622	1,611,027	40,276
1993	216,553	118,775	180,055	505,632	773,213	82,475	60,231	300,484	4,785	2,242,203	1,971,438	49,286
1994	78,483	82,304	150,109	196,937	208,003	65,837	157,260	231,740	2,271	1,172,944	1,479,938	36,998
1995	72,461	54,570	120,259	118,006	707,963	300,303	43,542	222,186	3,178	1,642,468	2,103,325	52,583
1996	79,798	55,528	72,558	82,826	470,431	57,751	9,695	224,447	6,605	1,059,639	1,158,674	28,967
1997	39,075	70,628	32,200	92,907	196,724	65,133	85,682	106,678	11,432	700,459	1,080,040	27,001
1998	25,034	56,084	66,797	68,887	11,667	62,584	6,512	50,923	9,487	357,975	1,409,354	35,234
1999	91,476	52,136	15,701	196,564	165,505	95,309	20,180	42,880	8,437	688,188	2,283,012	57,075
2000	87,552	38,687	10,648	79,245	462,371	113,686	20,129	34,725	5,555	852,598	1,730,087	43,252
2001	115,658	39,993	16,579	45,913	467,728	50,541	23,715	28,985	2,418	791,530	2,038,258	50,956
2002	102,662	62,423	100,240	629,772	347,831	185,684	42,038	25,987	4,514	1,501,151	3,173,716	79,343
2003	46,808	120,061	167,875	128,729	102,593	63,181	13,555	76,236	12,185	731,223	1,684,236	42,106
2004	21,816	124,419	16,464	278,749	90,214	70,608	8,690	150,703	9,137	770,800	1,737,892	43,447
2005	72,038	160,524	35,699	84,280	43,055	60,831	28,129	60,484	13,603	558,643	1,454,563	36,364
2006	79,639	81,611	200,708	246,882	200,725	111,028	14,894	105,137	1,234	1,041,858	2,649,091	66,227
2007	91,304	125,233	352,819	223,798	300,179	99,605	43,308	60,992	15,181	1,312,419	3,629,993	90,750
2008	34,237	103,760	167,179	318,899	172,518	101,735	19,128	56,384	689	974,529	2,494,972	62,374
2009	24,879	85,416	85,915	346,276	127,403	119,941	37,963	60,470	2,895	891,158	2,309,218	57,730
2010	45,743	197,062	116,058	145,663	374,599	56,505	57,338	127,221	3,720	1,123,909	2,881,296	72,032
2011	32,828	19,304	25,823	111,406	136,674	45,483	11,853	46,441	981	430,793	1,915,440	47,886
2012	24,796	104,425	194,101	61,508	37,611	46,570	5,356	13,920	9,936	498,223	2,026,300	50,658
2013	57,736	136,190	104,451	76,797	111,377	38,368	3,851	5,976	5,963	540,709	2,187,380	54,685
2014	100,297	68,768	318,201	300,399	169,879	50,467	494	25,917	3,997	1,038,419	4,065,320	101,633
2015	39,860	98,404	125,819	99,119	157,008	7,483	2,988	11,540	2,014	544,235	2,572,804	64,320
2016	24,243	86,528	165,315	270,944	83,466	30,032	1,870	17,127	1,517	681,042	4,105,503	102,638
2017	69,139	56,633	126,127	100,597	114,963	19,343	7,592	2,866	3,791	501,051	3,650,298	91,257

Table 5. Tautog recreational harvest (A + B1) by state in pounds, 1981-2017.

Source: MRFSS/MRIP (pre-recalibration), queried July 13, 2018.

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC
1981	790,611	664,568	242,337	1,496,039	161,424	6,584	10,296	742,653	536
1982	3,226,868	777,930	610,608	1,674,949	1,241,155	428,037	90,645	271,919	15,849
1983	1,837,262	615,595	458,582	1,124,844	414,957	4,437	6,551	1,267,166	20,144
1984	733,877	1,809,822	733,710	541,805	717,261	95,740	79,110	669,869	NA
1985	328,042	277,384	471,185	2,034,903	741,656	144,859	1,107	298,797	7,154
1986	7,862,584	2,042,584	838,346	2,833,208	2,132,571	264,744	10,049	918,138	4,173
1987	1,751,373	507,424	1,106,607	2,288,076	2,130,955	387,075	266,094	442,751	8,430
1988	2,255,930	612,123	610,171	2,380,285	1,331,833	249,803	446,947	1,410,003	4,605
1989	1,076,366	296,889	1,038,217	1,018,016	1,289,185	743,339	78,391	806,336	31,012
1990	895,327	389,579	200,000	1,980,289	1,256,488	142,627	59,721	229,442	2,703
1991	798,889	1,007,549	648,634	2,352,646	2,189,144	354,498	106,223	619,214	24,645
1992	1,668,485	656,712	1,048,639	1,199,558	2,485,693	183,854	159,730	255,995	12,559
1993	752,599	389,733	531,024	1,800,794	1,361,612	217,881	105,231	758,410	9,738
1994	373,189	328,668	417,438	585,037	330,551	152,033	177,358	1,101,130	2,708
1995	309,224	237,093	402,616	369,643	1,722,714	793,339	115,993	613,349	3,405
1996	397,284	248,840	245,817	193,046	1,123,174	158,751	26,483	778,315	13,191
1997	166,042	301,109	84,297	331,529	483,639	204,420	182,995	391,258	58,751
1998	96,695	316,339	231,622	208,743	41,431	257,348	27,648	273,515	26,420
1999	363,472	223,763	61,143	761,446	511,673	358,329	37,677	203,249	11,940
2000	442,816	203,602	58,475	258,100	1,812,960	373,581	56,126	188,187	4,502
2001	502,247	165,380	63,157	171,927	1,482,613	159,961	72,357	127,555	4,503
2002	521,611	265,116	447,140	2,135,221	1,184,560	652,007	104,246	116,797	4,448
2003	221,843	479,345	603,861	315,384	164,327	200,618	43,212	308,838	20,513
2004	104,513	682,329	77,219	965,837	276,724	243,467	21,633	553,866	33,579
2005	376,624	815,377	148,564	310,961	145,311	221,132	89,237	242,590	29,995
2006	296,636	380,140	842,213	782,424	734,509	406,336	47,463	430,157	4,008
2007	349,950	635,094	1,383,279	823,475	1,065,237	301,005	144,111	246,827	60,045
2008	106,871	491,403	715,317	1,094,903	518,814	365,619	62,710	232,557	1,228
2009	70,806	322,955	305,077	1,478,263	414,249	400,120	130,369	268,314	18,006
2010	163,057	918,693	409,370	508,487	1,044,598	151,793	201,769	477,734	9,605
2011	129,669	80,300	88,728	450,171	381,449	152,899	33,859	184,445	1,556
2012	94,699	534,716	982,891	252,745	133,048	171,329	17,670	49,988	11,677
2013	197,775	629,896	389,918	355,232	395,539	138,051	18,681	23,836	9,636
2014	399,812	297,955	1,643,470	1,365,338	579,934	187,915	3,004	121,352	9,472
2015	181,119	376,395	512,650	373,240	508,685	25,580	11,897	50,787	2,680
2016	72,342	338,501	705,146	1,162,729	262,665	100,253	7,708	52,236	2,873
2017	247,807	241,529	550,027	329,122	300,428	63,359	25,623	11,417	15,558

Table 6. Commercial landings for tautog in pounds, by state, 1981-2017.

Source: ACCSP Data Warehouse and State Compliance Reports.

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC
1981	102,900	69,800	20,500	81,400	54,400	1,000	1,200	700	N/A
1982	69,300	86,300	21,200	90,400	148,200	800	100	2,600	656
1983	57,600	142,600	33,500	88,400	100,600	800	N/A	1,700	319
1984	68,100	334,700	32,700	102,500	129,700	1,400	2,600	1,200	4,715
1985	63,300	403,200	50,100	84,500	125,500	3,200	2,400	1,639	531
1986	165,800	363,100	104,200	201,300	100,700	300	2,600	1,800	1,006
1987	250,000	420,500	159,200	225,200	95,200	500	3,800	2,700	confid
1988	277,100	328,900	112,100	255,000	88,000	600	6,100	2,800	214
1989	352,100	214,800	99,700	285,400	51,900	500	4,000	7,500	531
1990	289,074	211,084	82,008	181,543	99,112	500	3,954	5,151	1,079
1991	354,346	371,597	54,000	226,413	93,022	1,300	3,164	5,058	1,211
1992	292,291	359,767	65,700	169,011	116,332	200	4,058	4,389	424
1993	160,336	201,593	86,064	89,467	153,474	300	1,432	5,423	351
1994	37,062	130,719	43,000	71,375	162,641	400	1,718	11,441	1,134
1995	35,298	94,989	20,466	72,879	115,970	600	4,416	30,020	929
1996	32,579	64,817	33,327	105,466	89,435	1,599	3,622	26,137	452
1997	64,240	39,601	14,519	78,228	49,726	841	7,663	25,471	623
1998	91,319	20,304	6,905	68,892	42,426	1,715	5,682	14,770	2,173
1999	75,619	26,090	12,961	37,886	27,307	confid	6,489	20,901	728
2000	96,001	43,719	8,504	39,953	39,636	confid	3,896	14,794	674
2001	84,330	56,065	22,259	62,795	60,152	confid	4,591	14,587	414
2002	148,073	50,007	26,781	60,805	36,605	confid	5,010	22,834	705
2003	86,205	54,650	40,784	72,264	66,766	confid	5,213	10,705	98
2004	88,192	36,581	26,037	76,606	51,057	3,064	6,049	13,079	84
2005	99,344	42,838	24,053	52,525	61,163	confid	4,338	5,667	56
2006	147,609	47,261	16,841	71,683	58,119	confid	5,411	8,533	47
2007	95,820	63,441	30,002	73,797	62,979	2,814	3,297	8,588	187
2008	73,867	48,027	20,160	88,571	63,958	2,253	2,964	10,946	194
2009	54,703	50,920	21,194	87,289	14,591	2,116	1,638	11,132	61
2010	75,317	44,054	16,948	93,153	49,213	confid	1,285	6,077	34
2011	57,787	47,426	14,784	82,761	45,865	confid	confid	14,590	28
2012	67,870	50,126	6,233	76,373	20,831	1,444	confid	13,870	227
2013	70,157	53,428	5,887	110,849	22,079	confid	1,458	11,776	205
2014	63,191	53,384	5,164	121,538	31,665	confid	confid	7,545	137
2015	61,752	47,140	7,249	111,925	17,538	2,107	1,173	6,937	94
2016	58,095	50,680	7,651	144,650	13,367	2,083	1,098	6,252	30
2017	66,481	52,844	8,485	171,508	confid	confid	confid	5,165	116

Table 7. State recreational regulations implemented for tautog in the 2017 fishing year.

STATE	SIZE LIMIT (inches)	POSSESSION LIMITS (fish/person/day)	OPEN SEASONS (dates inclusive)
Massachusetts	16"	3	Jan 1 – Dec 31
Rhode Island	16"	3	Apr 15 – May 31
		3	Aug 1 – Oct 15
		6 (10 fish/day/vessel max for private/rental mode)	Oct 16 – Dec 15
Connecticut	16"	2	Apr 1 – Apr 30
		2	July 1 – Aug 31
		3	Oct 10 – Nov 23
New York	16"	4	Oct 5 – Dec 14
New Jersey	15"	4	Jan 1 – Feb 28
		4	Apr 1 – Apr 30
		1	Jul 17 – Nov 15
		6	Nov 16 – Dec 31
Delaware	15"	5	Jan 1 – Mar 31
		3	Apr 1 – May 11
		5	July 17 – Aug 31
		5	Sept 29 – Dec 31
Maryland	16"	4	Jan 1 – May 15
		2	May 16 – Oct 31
		4	Nov 1 – 26
Virginia	16"	3	Jan 1 – Apr 30 Sept 20 – Dec 31

Table 8. State commercial regulations implemented for tautog in the 2017 fishing year.

STATE	SIZE LIMIT	POSSESSION LIMITS (number of fish)	OPEN SEASONS	QUOTA (pounds)	GEAR RESTRICTIONS
Massachusetts	16"	40	Sept 1 – 100% of Quota	64,643*	Mandatory pot requirements. Limited entry and area/time closures for specific gear types.
Rhode Island	16"	10	Apr 15 – May 30 Aug 1 – Sept 15 Oct 15 – Dec 31	51,348**	Harvest allowed by permitted gear types only.
Connecticut	16"	4 (restricted licenses) 10 (all other)	Apr 1 – Apr 30 Jul 1 – Aug 31 Oct 8 – Dec 24	-	Mandatory pot requirements.
New York	15"	25 (10 fish w/ lobster gear and when 6 lobsters are in possession)	Jan 1 – Feb 28 Apr 8 – Dec 31	-	Mandatory pot requirements. Gill or trammel net is prohibited.
New Jersey	15"	> 100 lb requires directed fishery permit	Jan 1 – 15 June 11 – 30 Nov 9 – Dec 31	103,000	Mandatory pot requirements.
Delaware	15"	5 3 5 5	Jan 1 – Mar 31 Apr 1 – May 11 July 17 – Aug 31 Sept 29 – Dec 31	-	Mandatory pot requirements.
Maryland	16"	4 2 4	Jan 1 – May 15 May 16 – Oct 31 Nov 1 – 26	-	Mandatory pot requirements.
Virginia	15"	-	Jan 1 – Jan 21 Mar 1 – Apr 30 Nov 1 – Dec 31	-	Mandatory pot requirements. Pots prohibited in tidal waters.

* Massachusetts' quota adjusted for overage in 2016 from a base quota of 64,753 lbs.

** Rhode Island's quota of 51,348 lbs is divided equally among the three sub-periods.

Table 9. Number of age/length samples by state in 2017. Addendum III requires all states to collect 200 samples per year. Source: State compliance reports

State	2017 Samples	Sample Sources
MA	1,150	Fishery independent pot, rod and reel, and trawl surveys, ventless trap survey for Lobster
RI	326	Recreational fishery sampling, RIDMF Fish Pot Survey, RIDMF Trawl Survey
CT	75	Long Island Sound Trawl Survey
NY	96	Commercial markets and dockside sampling, recreational sampling
NJ	504	Recreational fishery and NJ Bureau of Marine Fisheries Ocean Trawl Survey
DE	92	Recreational sampling
MD	265	Recreational sampling
VA	211	Commercial sampling and Marine Sport Fish Collection Project

Table 10. Ongoing fishery-independent surveys, as of 2017. Shaded cells indicate survey data used in 2016 stock assessment.

State	Areas Surveyed	Survey Type	# of Survey Stations	Dates of Survey	Initial Year
MA	MA territorial waters	Trawl	1 station per 19 square nautical miles	May and September	1978
	Buzzards Bay, south of the Elizabeth Islands, and portions of Rhode Island Sound	Trap	42 stations twice per month	June through September	2015
	Buzzards Bay and Vineyard Sound	Rod & Reel	48 stations per month	Spring (Apr-May) Fall (Sep-Nov)	2016 (fall)
RI	Narragansett Bay	Trawl	13 stations per month	June through October	1990
	Narragansett Bay, Rhode Island Sound and Block Island Sound	Trawl	44 stations	Spring (April-May) Fall (Sept/October)	1979
	Narragansett Bay Beach	Seine	18 stations per month	June through October	1988
	Coastal Ponds	Seine	24 stations in 8 coastal ponds per month	May through October	1994
	Narragansett Bay	Trap	10, 5 pot trawls set per month	April through October	2013
CT	Long Island Sound (CT and NY waters)	Trawl	40 stations per month	Spring (April-June) Fall (Sept-Oct)	1984
NY	Peconic Bay	Trawl	16 stations per week	May through October	1987
	Western Long Island (Little Neck, Manhasset Bay, Jamaica Bay)	Seine	5-10 sites, semimonthly	May through October	1984
	Long Island Sound	Trap	35 stations per week	May through October	2007
NJ	Nearshore ocean waters between Cape May and Sandy Hook	Trawl	30 tows in Jan; 39 tows per month in Apr, Jun, Aug & Oct	Jan, Apr, June, Aug & Oct	August 1988
DE	Fisheries independent surveys do not collect tautog in quantities needed for monitoring purposes				NA
MD	Maryland Coastal Bays	Trawl	20 stations per	April through October	1989
		Seine	19 stations per month	June, September	1989
	Submerged Aquatic Habitat in Sinepuxent Bay	Seine	5 zones	September only	2015
VA	Fisheries independent surveys do not collect tautog in quantities needed for monitoring purposes				NA

Table 11. Ongoing fishery-dependent monitoring in each state, as of 2017

State	Fishery Sector	Data Collected	Data Source
MA	Commercial	Landings at the trip level	Harvesters and primary buyers
	Commercial	Length	Market sampling
RI	Recreational	Age, Length	Recreational harvest sampling
	Commercial	Age	Fish Pot Survey
CT	Commercial	Monthly landings	Harvesters and dealers
NY	Commercial	Age, Length	Markets and dockside sampling
NJ	Commercial	Age, Length, Weight, Sex	Commercial vessel sampling
	Recreational	Age, Length, Sex	Party/charter boat sampling (retained fish)
DE	Commercial	Landings	Monthly harvester logbooks
	Recreational	Age, Length	Recreational harvest sampling
MD	Recreational	Age, Length, Weight, Sex	Charter boat hook and line sampling
	Commercial	Landings	Harvest reports
VA	Commercial	Age, Length, Weights	Samples from commercial hook-and-line gear, haul seines, pots/traps, pound nets
	Recreational	Age, Length, Weights	VMRC Marine Sport Fish Collection Project
		Tagging data	Game Fish Tagging Program

*Surveys as part of MRIP occur in all states and are not included in the table. Commercial landings monitoring by the Standard Atlantic Fisheries Information System (SAFIS) is also excluded.