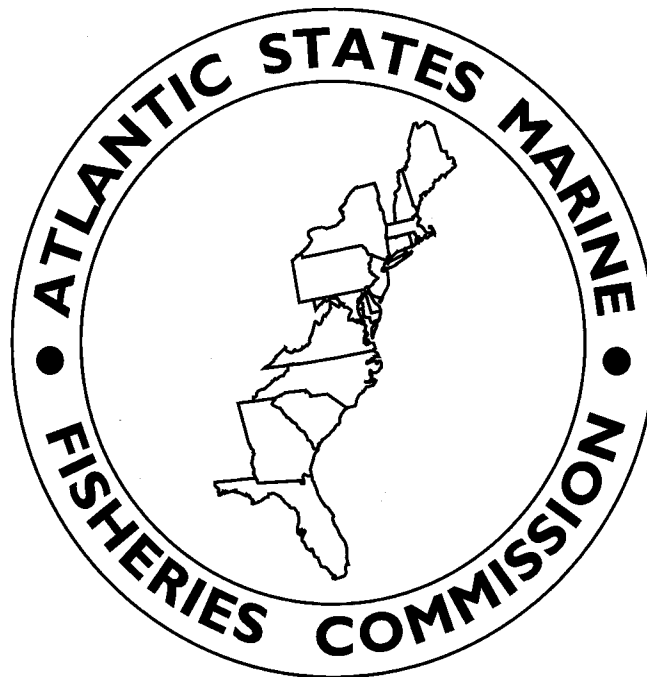


**Fishery Management Report No. 25c
of the
Atlantic States Marine Fisheries Commission**

***Addendum III to the
Fishery Management Plan for Tautog***



Approved February 18, 2002

Prepared by the Plan Review Team

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1. INTRODUCTION

1.1 BACKGROUND INFORMATION

The Atlantic States Marine Fisheries Commission (Commission) adopted the Fishery Management Plan for Tautog in March 1996. The FMP requires a minimum possession size to increase the spawning stock biomass and yield to the fishery. It also includes fishing mortality targets intended to rebuild the stocks and to prevent overfishing.

Addendum I to the FMP was approved by the Tautog Management Board on May 19, 1997. This Addendum was in response to the Board's concern about state's ability to meet the FMP's compliance schedule because of continuing problems with data deficiencies. Specifically, several states expressed concerns that the plan did not allow adequate time to determine state-specific fishing mortality rates. Further, the original FMP contained a compliance schedule that required states in the northern range of the species to implement management measures prior to states at the southern extent of the species range. Some of the members of the Management Board were concerned that the compliance dates should be consistent for states throughout the range of the species.

Addendum I required all states to implement management measures to reach the interim fishing mortality target ($F=0.24$) and a 14" size limit by April 1, 1998. Additionally it included the requirement that all states implement management measures to achieve the fishing mortality target of 0.15 by April 1, 2000. Also, the Addendum included *de minimis* requirements and corrected several typographical errors in the original FMP.

In the fall of 1999, the Tautog Management Board requested that Addendum II be developed to address: (1) adjusting the compliance schedule and (2) developing a list of issues to be considered in a subsequent addendum or amendment. Addendum II extended the compliance schedule out to April 2, 2002 instead of the earlier requirement, which mandated states to meet the target overfishing definition by April 1, 2000. Addendum II also listed a variety of issues, including (1) the chosen plan target of $F=M$ (2) clarification of the fishing mortality targets in the FMP with respect to individual state management program flexibility, (3) monitoring requirements in the FMP, (4) and data requirements to analyze management options by fishing modes within commercial and recreational fisheries.

Addendum III seeks to address these four issues as well as include updated information pertaining to tautog habitat and data collection requirements under the Atlantic Coastal Cooperative Statistics and Tagging Programs. The management measures herein, if adopted by the states, will apply within state waters. The Commission will recommend that the Secretary of Commerce implement the management measures adopted in Addendum III in federal waters.

1.2 FMP IMPLEMENTATION

1.2.1 Current Management Regulations

1.2.1.1 Commercial

Commercial regulations on tautog harvest vary greatly from state to state. As a baseline, the fishery management plan for tautog requires that all states implement, by April 1, 1998, and enforce a 14" minimum size for commercial fisheries. Massachusetts and Rhode Island have gone beyond this requirement by

implementing a 16” minimum size limit in state waters. Possession and seasonal closures have also been implemented by a variety of states in order to achieve the interim target of $F=0.24$ (1996=55% reduction in F). See Table 1 for a list of commercial tautog regulations by state.

Table 1: 2001 Commercial Tautog Regulations

STATE	SIZE LIMIT	POSSESSION LIMITS	OPEN SEASONS	QUOTA	GEAR RESTRICTIONS	IMPLEMENTATION DATE
MA	16”	40	April 15-May 15 July 11-October 31		Yes	<ul style="list-style-type: none"> ➤ April 1988 (gear restrictions) ➤ February 1994 (size limit) ➤ April 1997 (possession limit) ➤ April 1999 (seasons)
RI	16”	20	April 15-May 31 August 1-September 15 October 15-December 31	Yes	Yes	<ul style="list-style-type: none"> ➤ July 1994 (size limit) ➤ July 1995 (quota/seasons) ➤ May 1998 (possession limit)
CT	14”	a	January 1-April 30 June 15-Dec 31		Yes	<ul style="list-style-type: none"> ➤ May 1995 (size limit) ➤ June 1996 (possession limits/seasons/gear restrictions)
NY	14”	b	April 8 – last day in February	No	Yes	<ul style="list-style-type: none"> ➤ November 1997 (possession limit) ➤ November 1997 (gear restrictions) ➤ April 1998 (seasons) ➤ April 1998 (size limit)
NJ	14”		April 1-June 15 October 13-December 31	Yes	Yes	<ul style="list-style-type: none"> ➤ June 1999 (possession limits/seasons) ➤ 1999 (size limit) ➤ 1992 (size limit)
DE	14”					➤ June 1998
MD	14”	5			Yes	
VA	14”		Jan 1- April 30 Sept 1- Dec 31		Yes	➤ April 1998 (size limit/possession limits/seasons)

a The trawl fishery has a possession limit of 75 fish, the commercial hook, fish pot, trap net, fyke net, and gill net fisheries the possession limit is 25 fish, and in the lobster pot fishery the possession limit is 10 fish. Holders of Connecticut Marine Pound Net Registration may possess up to twelve fish year round except that during the May 1 through June 14 closed season all female tautog must be released without avoidable injury. All possession limits are daily limits.

b New York has a 25 fish vessel trip limit for commercially caught tautog, except only 10 per vessel are allowed when lobster pot gear and more than six lobsters are in possession.

1.2.1.2 Recreational

Recreational regulations on tautog harvest vary greatly from state to state. As a baseline, the fishery management plan for tautog requires that all states implement, by April 1, 1998, and enforce a 14” minimum size for recreational fisheries. Massachusetts, Rhode Island, and Delaware have gone beyond this requirement by implementing a 16”, 16”, and 15” minimum size limit in each of the state waters respectively. Possession and seasonal closures have also been implemented by a variety of states in order to achieve the interim target of

F=0.24 (1996=55% reduction in F). See Table 2 for a list of recreational tautog regulations by state.

Table 2: 2001 Recreational Tautog Regulations

STATE	SIZE LIMIT	POSSESSION LIMITS	OPEN SEASONS	IMPLEMENTATION DATE
MA	16"	6	-	<ul style="list-style-type: none"> ➤ February 1994 (size limit) ➤ April 1997 (possession limit)
RI	16" 16"	3 10	May 1-October 14 October 15-December 31	<ul style="list-style-type: none"> ➤ July 1994 (size limit) ➤ May 2000 (possession limits/open seasons)
CT	14"	4 (daily)	Jan 1-Apr 30, June 15- Dec 31	<ul style="list-style-type: none"> ➤ May 1995 (size limit) ➤ June 1996 (possession limits/seasons/gear restrictions)
NY	14" 14"	1 10	June 1 – October 6 October 7- May 31	<ul style="list-style-type: none"> ➤ April 1998 (size limit/possession limits/seasons)
NJ	14" 14"	1 10	June 1 – October 9 October 10 – May 31	<ul style="list-style-type: none"> ➤ April 1998 (possession limits/open season) ➤ 1999 (size limit)
DE	14" 15"	10 ^c 3	Jul 1 - Mar 31 Apr 1 - Jun 30	<ul style="list-style-type: none"> ➤ 1992 (size limit/possession limits/open season)
MD	14"	5	-	<ul style="list-style-type: none"> ➤ June 1998
VA	14"	7	Open	<ul style="list-style-type: none"> ➤ April 1998 (size limit) ➤ January 1999 (possession limit/seasons)

c Delaware has an 11 day closure from September 8 through September 18.

1.3 DESCRIPTION OF THE FISHERY

The tautog fishery is primarily recreational, extending from Maine to Virginia. Recreational landings have accounted for approximately 90% of total landings over the past six years. Most landings occur in state waters between Cape Cod and Chesapeake Bay. Tautog have historically ranked seventh in recreational species sought in both the North Atlantic and Mid-Atlantic sub-regions. Tautog are most frequently caught in the spring and fall months, although some Mid-Atlantic Region fishermen pursue them year-round and there is an active fishery from December through March between New Jersey and North Carolina.

1.3.1 Recreational

1.3.1.1 Annual Harvest

Recreational catches fluctuated without trend from 1981 to 1985. Harvest peaked at approximately 17 million pounds in 1986 and declined steadily, reaching the 1.7 million pound mark in 1998. The most recreationally landed tautog were previously caught in Massachusetts, New York, and New Jersey during the 1981 to 1995 time period (pre-plan), with those states accounting for 58 % of the recreational harvest by weight. Since plan implementation New Jersey, Virginia and New York are now the top three recreational landing states, accounting for approximately 58% of the catch (table 3 and figure A).

Table 3. Tautog recreational harvest (A + B1) in weight (lbs.) of fish, 1996-2000 by state. Data from MRFSS as of 11/06/01.

Year	CT	DE	MD	MA	NJ	NY	RI	VA	NC	Total
1996	245,817	158,751	26,484	397,284	1,123,173	193,046	248,840	778,314	13,190	3,184,899
1997	84,297	204,419	182,995	166,042	483,639	331,530	301,109	319,257	58,750	2,132,038
1998	231,622	257,347	27,648	96,694	41,431	208,743	316,338	273,516	26,420	1,479,759
1999	61,142	358,329	37,677	363,472	511,672	761,447	223,762	203,249	11,940	2,532,690
2000	55,957	355,141	53,876	428,259	1,767,979	244,142	190,387	184,430	4,235	3,284,406
Average	113,139	222,331	54,780	241,959	654,649	289,818	213,406	293,128	19,089	2,102,299

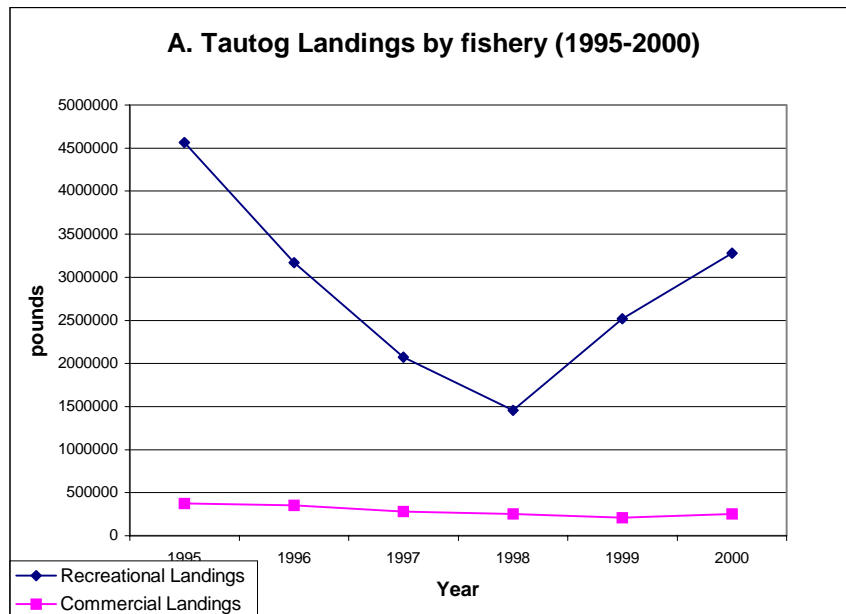
1.3.2 Commercial

1.3.2.1 Annual Harvest

Commercial landings fluctuated without trend, around the 200,000 pound mark, from 1950 until 1980. Landings began to increase in the early 1980's and reached a high of 1,157,100 pounds in 1987. Commercial interest in tautog increased substantially during the mid 1980's in response to higher market prices. From 1986 through 1992 landings were sustained at around a million pounds. A steep decline in landings began in 1993 and continued up to 1999. Commercial landings were only 209,140 pounds in 1999 but rose slightly in 2000 (Table 4 and Figure A). Most commercial landings are taken by otter trawls, with gillnets, hook and line, fish pots, and lobster traps all accounting for a share. Massachusetts, New York and New Jersey have been the predominant states for commercially caught tautog over the past five years, accounting for approximately 70% of coast-wide commercial landings.

Table 4. Tautog commercial landings in thousands of pounds, 1996-2000 by state. Data from NMFS commercial statistics homepage as of 11/06/01.

Year	CT	DE	MD	MA	NJ	NY	RI	VA	NC	Total
1996	33,327	-	3,622	32,579	89,435	105,466	64,876	26,137	452	322,567
1997	14,519	841	7,663	64,275	49,726	78,228	39,601	25,471	623	280,947
1998	6,905	1,715	5,682	91,424	42,426	69,004	20,327	14,770	2173	254,426
1999	12,961	844	6,489	75,685	27,392	38,033	26,107	20,901	728	209,140
2000	8504	257	3,896	96,001	39,636	38,487	43,719	14,794	674	245,968
Average	12,703	731.4	4,559	59,994	41,436	54,870	32,438	17,012	775	224,518



1.4 DESCRIPTION OF THE RESOURCE

1.4.1 State of the Stock

Tautog are long-lived, with individuals over age 30 reported from Rhode Island, Connecticut, and Virginia. Most females mature (80%) at age 3. Natural mortality (M) has been estimated at $M=0.15$ for males and $M=0.2$ for females.

An assessment was completed in 2001, using data from 1981 through 2000. A coastwide estimate of fishing mortality rates was derived with a VPA using fisheries dependent and independent data (independent data from Massachusetts through New Jersey only). Results indicate that fishing mortality rates have declined from a high of 0.71 in 1993, to 0.41 in 2000. Since the 2000 rate exceeds both the final plan target of $F=M=0.15$ tautog are considered overfished (Table 5). Abundance indices through 2000 show a slight increase in biomass and recruitment in recent years.

Table 5: Landings and Status Table

Year	Fishing Mortality ₁	Stock size ₂	SSB ₃	Age 1 Recruits ₄
1995	0.54	10.6	18.0	1.9
1996	0.37	9.6	16.6	2.1
1997	0.29	8.9	15.6	1.8
1998	0.22	8.4	16.7	1.5
1999	0.60	8.4	18.6	1.5
2000	0.41	10.4	16.6	4.1
Averages 1995-2000	0.40	9.4	17.0	2.2
Average 1981-2000	0.38	23	39.6	4.4

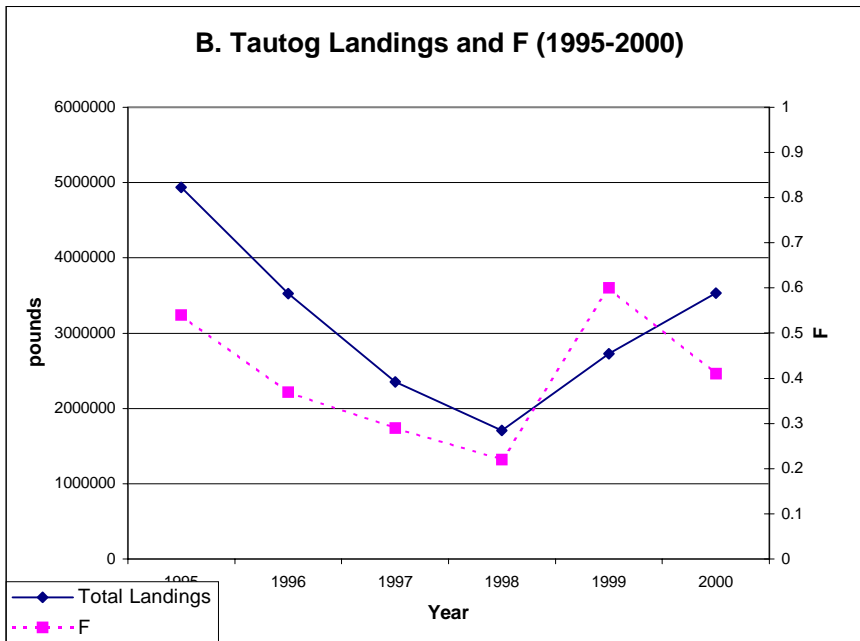
1. As estimated by 2001 VPA runs.
2. Stock size in millions of fish.
3. SSB in millions of pounds.
4. Recruits in millions of fish.

1.4.2 Biological Reference Point

This Addendum revises the previous plan target to $F_{40\%SSB}$. Life history parameters for this species, and similar species, suggest that F values approaching this level continue to be appropriate for stock recovery. The estimates of $SSB_{40\%}$ and $F_{0.1}$ obtained in the last assessment (0.17 and 0.14 respectively) have been recalculated with the recruitment vectors and spawning stock weights from the recent VPA runs. The recalculated values are $SSB_{40\%} = 0.29$ and $F_{0.1} = 0.21$. The changes can be largely attributed to the increased minimum sizes now in effect coast-wide.

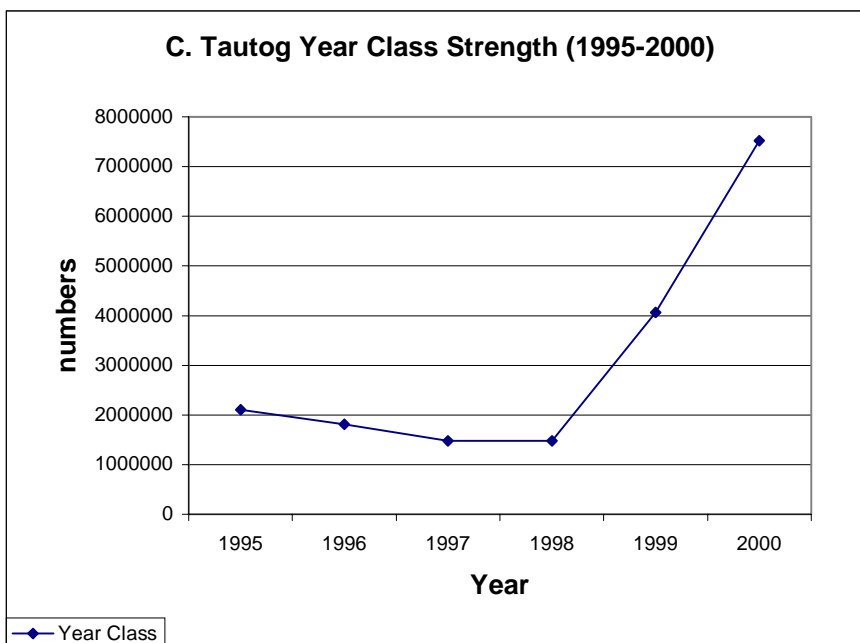
1.4.3 Fishing Mortality

Updated VPA runs calculated F for 2000 at 0.41 (Figure B). The fishing mortality rate declined to desired levels immediately after plan implementation and has since returned to levels approaching those prior to FMP restrictions.



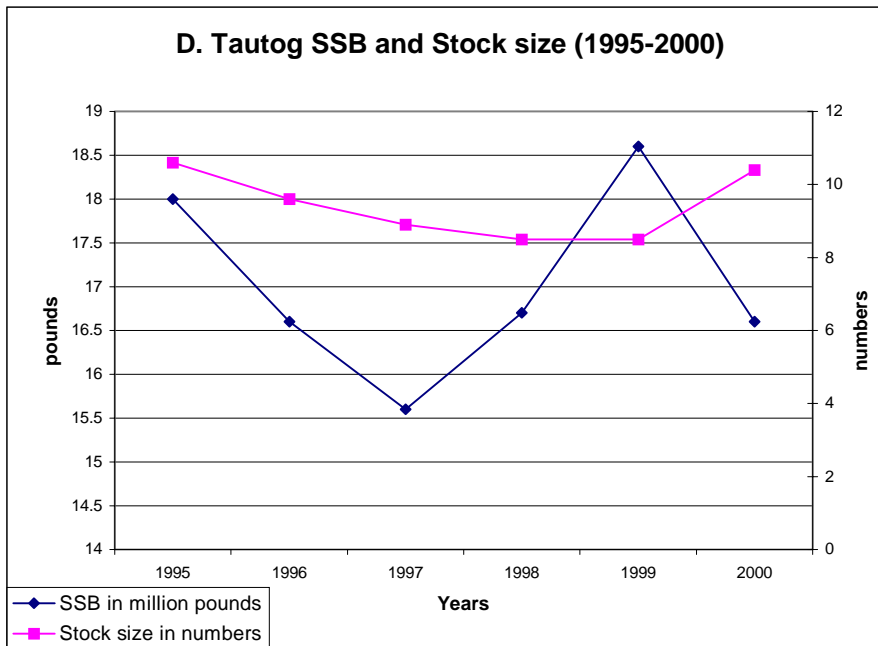
1.4.4 Recruitment

Young of the year indices and VPA outputs indicate stronger year classes in 1999 and 2000 (Figure C).



1.4.5 Spawning Stock Biomass

The current index of spawning stock biomass is below the time series average, while the stock size is slightly above the time series average, indicating that a considerable proportion of the recent growth in the stock is from fish younger than spawning age (Figure D).



1.4.6 Special Comments

Since commercial landings have not risen appreciably since plan implementation and the recreational fishery accounts for approximately 90% of the total harvest, recent increases in recreational landings appear to be the primary driver of increases to the fishing mortality rate. The presumed reason for the increased recreational landings is the recoupment of forgone harvest of fish that were initially protected by increased minimum sizes but have since grown to lengths exceeding the minimum sizes of most states (Figure B).

A good economy with commensurate increases in recreational fishing activity and increasing or decreasing restrictions on the harvest of alternative target species may also have played a role in the recent changes in recreational harvests. Examples would be an increase in the allowable harvest of striped bass in 1998 and early closures to recreational fluke fishing in 2000. Additionally, the adoption of higher possession limits during some months of the year, and seasonal closures that were adopted that fall within MRFSS sampling waves where the catches are not evenly distributed may not have effectively reduced landings. Imprecision of recreational fisheries data also plays an unknown role in the calculation of expected harvest savings from the selection of various management options.

1.5 HABITAT CONSIDERATIONS

The ASMFC Habitat program reviewed the recent literature related to tautog and its habitat that has been released since the Tautog Fishery Management Plan was completed in 1996. A few studies that provide information on tautog habitat are discussed here to supplement the information included in the 1996 plan.

The NOAA Technical Memorandum titled “Tautog (*Tautoga onitis*), Life History and Habitat Requirements” was in press during the development of the ASMFC Tautog FMP in 1996. It provides an extensive overview of the habitat requirements for Tautog. When NOAA has developed a document such as this for an ASMFC managed species, the Commission will not develop its own Habitat Source Document and will rely on the technical memorandum for background material.

Additional relevant studies not included in either the ASMFC Tautog Fishery Management Plan or the NOAA technical memo are discussed below. A study on the seasonal occurrence of tautog in the lower Chesapeake Bay indicates that most fish tagged and released in inshore waters remained inshore for the winter rather than moving offshore (Arendt, Lucy, and Munroe, 2001). Tautog observed by other researchers in NY, RI, and MA moved offshore during winter months. Another study examined the habitat-related differences in growth rates in young of the year in their northern range (Phelan et. al, 2000). The growth rates varied and were most likely dependant on a variety of biotic and abiotic factors. From this study it would be difficult to evaluate the effect of habitat quality on growth due to the variability and limited geographic scope.

A series of laboratory habitat choice experiments in Delaware indicated that YOY tautog showed greatest preference for *Ulva lactuca*-fouled rock structures, followed by *Ulva lactuca* alone, rock structure, and the least preferred habitat studied, *Zostera marina*, eel grass (Wong and Targett in preparation). No SCUBA observations of YOY recruitment were reported on coastal reef sites (located greater than 10 km from shore). However, limited observations of YOY were noted on estuarine reef structures, (rocky reefs with and without macroalgae present).

A reproductive biology study of tautog from Virginia reported batch and annual fecundity estimates, spawning locations, microscopic descriptions of gonad development, and daily spawning patterns. Although batch fecundity estimates by White (1996) were similar to those of Chenoweth (1963) and Stolgitis (1970), analysis of post ovulatory follicles estimate approximately 60 spawning days per year, thus annual fecundity estimates are much higher than previously thought. Annual fecundity estimates can be used in estimating total egg production and evaluating spawn-recruit relationships. The tautog is a multiple spawner in the wild, and shows no evidence of protogynous hermaphroditism. From April through June, fish were collected in spawning condition from inside the Chesapeake Bay out to 35 miles offshore (depth = 120 feet). It appears that tautog spawn during the daylight ebb tidal current (White, 1996).

A genetic study in Delaware of tautog from Rhode Island, Delaware, and Virginia evaluated genetic variation patterns through DNA analysis to determine if there is one or multiple genetic stocks. This study could not identify genetic distinctions between fish from Rhode Island, Delaware, and Virginia, implying one genetic stock (Orbacz and Gaffney, 2000).

2 GOALS AND OBJECTIVES

2.1 OVERFISHING DEFINITIONS

This Addendum redefines overfishing as a fishing mortality rate exceeding 0.29 ($F_{40\%SSB}$). This reference point will allow states to quantify reduction in exploitation that are associated with a variety of management approaches as well as provide a more intuitive estimation of long term maintenance of population levels, especially where the relationship between biomass and recruitment is more clearly defined.

2.2 STOCK REBUILDING PROGRAM

2.2.1 Schedule for stock rebuilding targets

This Addendum requires that states maintain current or more restrictive fishing regulations during calendar year 2002 and that states implement management measures to meet $F_{40\%SSB}$, which is currently $F=0.29$, no later than April 1, 2003.

3 MANAGEMENT PROGRAM SPECIFICATIONS

For a detailed description of the coastwide requirements, prohibited actions, and other compliance measures that are applicable, readers should refer to *Fisheries Management Report No. 25 of the Atlantic States Marine Fisheries Commission: Interstate Fishery Management Plan for Tautog, Addendum I, and Addendum II*.

The provisions in this section may be changed in order to meet the goal and objectives specified in Section 2 of the FMP.

3.1 ASSESSING ANNUAL RECRUITMENT, SPAWNING STOCK BIOMASS, AND FISHING MORTALITY

Given lacking data to support a regional or redefined regional assessment at this time, the Tautog Management Board has approved continuation of a coastwide VPA assessment, until such time as there are sufficient data and analyses to allow for regional or redefined regional assessment approaches.

3.2 SUMMARY OF MONITORING REQUIREMENTS

This Addendum requires all states to collect data to continue support of a coast-wide stock assessment until such time that there are sufficient data and analyses to allow for regional or redefined regional assessment approaches. The intent being that states will begin to collect data necessary to support future regional assessments. As such, states are required to collect and report commercial and recreational catch estimates (provided at a comparable level of precision to that of the current VPA), a suitable time series as determined by the Tautog Technical Committee of fisheries independent indices of abundance (continuing in Northern region and expanding in Southern region), and 200 age and length samples per state (5 fish per centimeter), within the range of lengths commonly caught by the fisheries.

3.3 ATLANTIC COASTAL COOPERATIVE STATISTICS PROGRAM (ACCSP)

3.3.1 Commercial Catch and Effort Data Collection Programs

The ACCSP commercial data collection program will be a mandatory, trip-based system with all fishermen and dealers required to report a minimum set of standard data elements (refer to the ACCSP Program Design document for details). Submission of commercial fishermen and dealer reports will be required after the 10th of each month.

Any marine fishery products landed in any state must be reported by a dealer or a marine resource harvester acting as a dealer in that state. Any marine resource harvester or aquaculturist who sells, consigns, transfers, or barter marine fishery products to anyone other than a dealer would themselves be acting as a dealer and would therefore be responsible for reporting as a dealer.

3.3.2 Recreational Catch and Effort Data Collection Programs

The ACCSP recreational data collection program for private/rental and shore modes of fishing will be conducted through a combination telephone and intercept survey. Recreational effort data will be collected through a telephone survey with random sampling of households until such time as a more comprehensive universal sampling frame is established. Recreational catch data will be collected through an access-site intercept survey. A minimum set of standard data elements will be collected in both the telephone and intercept surveys (refer to the ACCSP Program Design document for details). The ACCSP will implement research and evaluation studies to expand sampling and improve the estimates of recreational catch and effort.

3.3.3 For-Hire Catch Effort Data Collection Programs

The ACCSP is conducting an evaluation study to determine the best method(s) of data collection for for-hire fisheries. A minimum set of standard data elements will be collected in all for-hire catch/effort surveys (refer to the ACCSP Program Design document for details).

3.3.4 Discard, Release, and Protected Species Interactions Monitoring Program

The ACCSP will require a combination of quantitative and qualitative methods for monitoring discard, release, and protected species interactions in commercial, recreational, and for-hire fisheries. Commercial fisheries will be monitored through an at-sea observer program and several qualitative programs, including strandings, entanglements, trend analysis of logbook reported data, and port sampling. Recreational fisheries will be monitored through add-ons to existing intercept surveys and additional questions added to the telephone survey. For-hire fisheries will be monitored through an at-sea observer program and several qualitative programs (refer to the ACCSP Program Design document for details).

3.3.5 Biological Information

The ACCSP will require the collection of baseline biological data on commercial, for-hire, and recreational fisheries. Biological data for commercial fisheries will be collected through port sampling programs and at-sea observers. Biological data for recreational fisheries will be collected in conjunction with the access-intercept

survey. Biological data for for-hire fisheries will be collected through existing surveys and at-sea observer programs. A minimum set of standard data elements will be collected in all biological sampling programs (refer to the ACCSP Program Design document for details). Priorities and target sampling levels will be determined by the ACCSP Biological Review Panel, in coordination with the Discard/Release Prioritization Committee.

1.4 Tagging Program

Tagging of fish and shellfish with individually-numbered tags is a proven technique for determining movement and migration routes and rates, growth rates and patterns, estimation of mortality/survival, estimation of population size (if assumptions are met), stock identification and determination of movement/migration corridors and habitat use. The use of more sophisticated electronic tags can provide additional habitat information such as temperature (of both water and fish body), depth and specific location. The species' Advisory Panel, Stock Assessment Subcommittee, Technical Committee and/or Management Board (for ASMFC), Advisory Panel or Committee (for Fishery Management Councils) and working groups for International Fisheries Commissions may decide to recommend that tagging studies be performed. Alternatively, such studies may be initiated independently by one or more of the partners in the fishery management process.

Fish and shellfish tagging is a technical activity which is usually conducted by scientific personnel; however a number of other entities have become involved in or conducted their own tagging studies. Should a tagging study be proposed for tautog, a number of considerations should be addressed. Any proposed study must have stated objectives, which directly relate to scientific or management purposes. A second important consideration is whether a species can be tagged with minimal mortality, as the utility of study data will be highly questionable if handling/tagging mortality is high. Should a species prove tag-able, an appropriate tag should be selected for use. The ideal tag should be one which has a unique alpha-numeric identifier and organization contact information, is easily emplaced, has a high rate of retention, is readily visible to potential recoverers without increasing an animal's susceptibility to predation, and remains permanently legible, or in the case of internally-embedded coded wire (CWT) or passive integrated transponder (PIT) tags, is easily and consistently detectable. The implantation location and type of CWT or PIT tags should be fully coordinated with other investigators tagging the same species. Tag number sequences and colors of externally visible tags should be coordinated with other investigators conducting similar studies, via the Interstate Tagging Committee, to ensure that duplication does not occur, and contact information for recoveries and returns should be clearly imprinted on the tag. Tagging should be conducted in a consistent manner by personnel who have been properly trained. Consideration should be given to requiring certification of both professional staff and volunteer angler taggers by the sponsoring organization, in order to increase both the efficiency of tagging and the survival of tagged fish or shellfish through minimization of handling/tagging mortality. The ASMFC Interstate Tagging Committee is in the process of developing a certification for tagging programs, for which sponsoring organizations may wish to apply.

Tagging studies should be highly publicized among the fishing public to maximize the rate of return from both commercial and recreational sectors. In most cases, efforts should be undertaken to accurately measure the rate of tag encounter and return reporting. Each study conducted should ideally assess short-term tagging (handling) mortality; short and long-term tag loss; and reporting rates for each fishery sector. Advertised/promised rewards should be provided promptly upon receipt of data. Study managers should insist on complete and accurate return information. Numbers of animals tagged should be sufficiently high to ensure that the desired information will be produced by the study. Careful and appropriate study design (i.e., purpose, location, sample

size, duration, recapture procedures, analysis) is vital to ensure success. Prior to study implementation, a repository for any resultant data should be specified, and long-term commitments made by the sponsoring program, and resources made available to analyze and publish the results. Funds should be provided/reserved to process recaptured tagged animals reported after the program has ended. In angler programs, participants with tagging kits should be notified when the program has ended. All incoming tagging data should be added to the existing database until no additional data are received. Failure to respond to reports of recaptured fish will be detrimental to surrounding tagging programs. Tag reporting apathy develops in anglers when they do not receive replies from the tagging entity.

Investigators may wish to consider collaboration with existing tag database managers (e.g., National Marine Fisheries Service, Southeast Fishery Science Center, Miami, FL, 305-361-4248; NMFS Northeast Fishery Science Center, Woods Hole, MA, 02543; or U.S. Fish and Wildlife Service, Fishery Resources Office, Annapolis, MD, 410-263-2604) for data entry and analysis. Studies should not be undertaken without adequate consideration of all of these issues. The Interstate Tagging Committee strongly encourages programs which are implemented with: 1) connection to an agency or scientific entity for study design and data analyses; 2) an established constituent base to promote the program; 3) training for individuals on proper fish handling and tagging techniques; and 4) identified research needs and objectives.

Any public or private entity which is proposing new tagging studies for tautog should seek guidelines from and provide a proposal to the Interstate Tagging Committee for review and coordination prior to initiation of any study. The proposal should use the ASMFC's Protocols for Tagging Programs as guidance in developing the proposed study. If the proposed study is an integral component of the FMP, study design should ideally be reviewed and approved by the Stock Assessment Subcommittee and/or Technical Committee as well, during the FMP review process. Tagging studies outside the ASMFC jurisdiction may choose not to participate in the ASMFC review process.

The ASMFC's Interstate Tagging Committee was developed to serve as a technical resource for jurisdictions other than the ASMFC, as well as for private, non-profit tagging groups, who may plan to tag tautog. Protocols have been developed by the Committee as a source of information, advice and coordination for all Atlantic coast tagging programs. A copy of the protocol is available on the ASMFC web site. Copies of proposals for review and coordination should be provided to the Interstate Tagging Coordinator at the ASMFC.

4 MANAGEMENT PROGRAM IMPLEMENTATION

States must implement regulations to reduce fishing mortality to the target of $F_{40\%SSB}$, which is currently equivalent to $F=0.29$. The years 1998 through 2000 are to be used as a benchmark period for determining fishing mortality reductions based upon implementation of all states FMP measures beginning in April 1998.

If a state can provide evidence, at the same level of precision as most recent assessment, of fishing mortality rates below what is indicated in the plan, then that state is only required to implement restrictions that will be sufficient to reach the target fishing mortality level. Any state utilizing this option must monitor its fisheries to assure that fishing mortality rates do not exceed the target.

Compatible regulations between adjacent states are desirable to prevent the shift of fishing effort to areas with more liberal regulations, or to area with an open season, if seasonal closures are implemented. Regulations cannot be split by mode of fishing unless state can provide data at CV less than 0.2.

Any state that exceeds its commercial or recreational targets in a given year will have the overage deducted from the following years catches.

4.1 MANAGEMENT MEASURES

States must implement regulations to reduce fishing mortality in the recreational fishery only to achieve the target ($F_{40\%SSB}$), according to the schedule outlined in Section 2.2 of this Addendum. Reductions to the recreational harvest will have the most effect in reducing F since commercial landings appear to be adequately controlled by recently implemented regulations and landings are composed primarily of recreational catch (91 % time series average). While it appears that the 1997 and 1998 reductions in F are primarily from increases in minimum fish sizes, those fish have since recruited to the fisheries through growth, and existing controls do not appear to be effectively capping recreational harvest.

States may implement more restrictive regulations in either the recreational or commercial fishery at any time.

The Management Board may vary the requirements of this Section as a part of adaptive management as necessary to achieve the goals and objectives of the fishery management plan. Because specific measures for achieving fishing mortality targets are to be determined by each state, each state may change those regulations, providing such changes are made in accordance with procedures established in Section 4.4 of the Interstate Fishery Management Plan for Tautog (April 1996).

4.1.1 Recreational Fisheries

Recreational fisheries reduction to reach the target $F_{40\%SSB}$, currently at $F=0.29$, may be achieved through possession limits, seasons, or a combination of both. The fishing mortality reductions associated with possession limits and seasonal closures and have been developed for each state based on (1998-2000) catch data. Discard mortality rate of 2.5% has been incorporated into Table 7 below.

Based on the coastwide average fishing mortality rate of $F=0.41$, a 48% reduction in fishing mortality is needed to reach the target established in this Addendum. However, for states that exhibit a lower current fishing mortality rate, the plan only requires the appropriate level of reduction that will reach the F based target. Reductions can be calculated using the equation below.

Table 7. Percent reductions in tautog recreational fisheries at different possession limits by state; 1999-2000

Possession limit	MA	RI	CT	NY	NJ	DE	MD	VA
1	64.35	69.23	56.55	63.38	63.38	71.18	30.23	53.63
2	43.88	50.70	34.13	39.98	42.90	50.70	7.80	33.15
3	27.30	35.10	13.65	24.38	29.25	35.10	6.83	18.53
4	14.63	23.40	0.00	14.63	22.43	25.35	1.95	11.70
5	5.85	15.60	0.00	7.80	14.63	14.63	0.00	7.80
6	0.00	8.78	0.00	3.90	8.78	9.75	0.00	3.90
7	0.00	4.88	0.00	1.95	4.88	6.83	0.00	0.00
8	0.00	1.95	0.00	0.98	2.93	3.90	0.00	0.00
9	0.00	0.98	0.00	0.98	0.98	1.95	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Percent reductions based upon maintaining all existing possession limits and seasons or maintenance of existing lower possession limits and seasons. See * below.

Table 8. Percent reduction in tautog recreational landings for bi-monthly seasonal closures (percent landings from MRFSS by state and wave); 1999-2000

Wave	MA	RI	CT	NY	NJ	DE	MD	VA
1	-	-	-	-	-	-	-	-
2	24.02	0.94	0.00	0.00	7.46	0.76	2.42	64.56
3	28.48	23.82	0.00	24.94	9.04	7.20	4.02	5.66
4	2.24	7.46	3.42	4.82	0.54	1.56	4.08	0.00
5	25.76	16.78	56.04	20.68	46.72	76.43	27.06	6.02
6	19.50	51.00	40.56	49.58	36.24	14.05	62.42	23.76

Note: No data is available from MRFSS to evaluate percent reductions in wave 1. Percent reductions for all other waves are based upon maintaining all existing seasonal closures. See * below.

* The values in Tables 7 and 8 are not additive. Therefore, if both possession limits and seasonal closures are used, the total reduction is not the sum of the values from each table. To determine the total reduction, it is necessary to account for the effects of one measure on the others. This can be done using the following formula:

$$\text{Total reduction} = X + \{(1-X)*Y\};$$

X = the percent reduction value from the seasonal closure table,

Y = the percent reduction value from the possession limit table.

4.1.2 Commercial Fisheries

While states are not required to take reductions in commercial fisheries to reach the plan target ($F_{40\%SSB}$), states may implement more restrictive regulations in the commercial fishery at any time. States are given the flexibility to develop a commercial fishery management regime that will best meet their particular needs. The

fishing mortality reductions for commercial seasonal closures are given in Table 9. Reductions can be calculated using the equation below.

The relative burden of the conservation program and management measures will vary from state to state relative to the importance of the fishery in that state as compared to its importance in other states throughout the species range.

Table 9. Potential percent reduction in commercial landings for monthly seasonal closures (from percent commercial landings by month and state, 1999-2000, combined)

	CT	DE	MD	MA	NJ	NY	NC	RI	VA
JAN	0.2	2.8	7.4	0.0	6.6	1.3	34.5	0.0	22.4
FEB	0.1	0.0	0.2	0.0	0.1	0.9	37.5	0.0	11.4
MAR	0.2	0.3	0.4	0.0	0.2	0.1	6.3	0.0	10.6
APR	7.3	5.1	7.5	5.9	5.6	3.4	2.7	0.0	12.0
MAY	1.5	18.3	16.3	26.1	10.1	20.4	4.1	44.9	4.3
JUN	23.2	19.4	2.4	0.0	9.7	13.8	0.9	15.4	1.3
JUL	9.8	10.2	17.2	3.8	0.0	8.4	1.4	0.0	1.8
AUG	2.4	0.5	15.5	4.1	0.1	6.7	0.0	12.3	0.8
SEP	5.2	1.3	2.3	9.2	0.4	7.3	0.0	6.5	0.5
OCT	11.1	17.2	16.6	46.7	11.9	12.9	0.5	6.4	5.6
NOV	33.9	7.4	9.3	4.3	28.8	15.5	1.2	13.5	15.7
DEC	5.0	17.4	4.9	0.0	26.5	9.2	10.8	1.0	13.5
% Total	100	100	100	100	100	100	100	100	100

5 RECOMMENDATIONS FOR ACTIONS IN FEDERAL WATERS

The Atlantic States Marine Fisheries Commission (ASMFC) believes that the measures contained in the Interstate Fishery Management Plan, Addendum I, Addendum II, and Addendum III are essential for effective management of the tautog fishery. The ASMFC recommends that the federal government promulgate all necessary regulations to implement compatible measures in the Exclusive Economic Zone. Specifically, the ASMFC recommends that the Secretary of Commerce fully implement regulations for tautog in the EEZ that are in accordance with state minimum sizes, possession limits, closed seasons, as well as other landing requirements.

6 COMPLIANCE

6.1 MANDATORY ELEMENTS OF A STATE PROGRAM

To be considered in compliance with Addendum III, all state programs must include a regime of restrictions on tautog fisheries consistent with the requirements of Section 2, 3 and 4. Under Section 4.4 of the Interstate Fishery Management Plan for Tautog, the Management Board may vary the requirements specified as part of adaptive management as necessary to achieve the goals and objectives listed in the FMP.

6.1.1 REGULATORY REQUIREMENTS

Each state must submit its required tautog regulatory program to the Commission through ASMFC staff for approval by the Board. During submission, until the Board makes a decision on a state's program, a state may not adopt a less restrictive management program than contained in this Addendum.

6.1.2 COMPLIANCE SCHEDULE

State management programs must have regulations to implement Addendum III by the dates indicated in order to be in compliance with the Fishery Management Plan for Tautog.

April 1, 2002: States maintain current or more restrictive fishing regulations

May 1, 2002: Plan Review Team will review State compliance reports

August 2002 ASMFC Meeting Week: Management Board will review state compliance

October 1, 2002: Due Date for states to submit proposals to meet F_{40%SSB}

November 2002 ASMFC Meeting Week: Management Board will review and take action on state proposals

April 1, 2003: States Implement Regulations to Meet F_{40%SSB} Target

May 1, 2004: Plan Review Team will review State compliance reports

Summer 2004: Technical Committee will update coastwide stock assessment

Summer 2004 ASMFC Meeting Week: Management Board will review state compliance