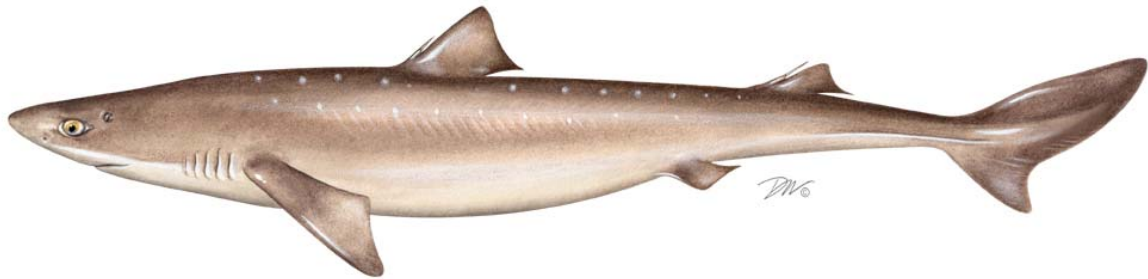


**REVIEW OF THE  
INTERSTATE FISHERY MANAGEMENT PLAN FOR  
SPINY DOGFISH  
(*Squalus acanthias*)**



**May 2008 – April 2009 FISHING YEAR  
Board Approved: November 2009**

**Prepared by the Spiny Dogfish Plan Review Team:**  
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## I. Status of the Fishery Management Plan

<u>Date of FMP Approval:</u>	November 2002
<u>Date of Addendum I Approval:</u>	November 2005
<u>Management Unit:</u>	Entire coastwide distribution of the resource from the estuaries eastward to the inshore boundary of the EEZ
<u>States With Declared Interest:</u>	Maine - Florida
<u>Active Boards/Committees:</u>	Spiny Dogfish and Coastal Shark Management Board, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, and Plan Review Team

The Mid-Atlantic and New England Fishery Management Councils jointly manage the federal spiny dogfish fishery. In April 1998, the National Marine Fisheries Service (NMFS) declared spiny dogfish overfished. NMFS partially approved the federal Fishery Management Plan (FMP) in September 1999, but implementation did not begin until May 2000, the start of the 2000-2001 fishing year. The federal FMP uses a target fishing mortality to specify a coastwide commercial quota and splits this quota into two seasonal periods (Period 1: May 1 to October 30 and Period 2: November 1 to April 30). The seasonal periods can have separate possession limits that are specified on an annual basis.

In August 2000, ASMFC took emergency action to close state waters to the commercial harvest, landing, and possession of spiny dogfish when federal waters closed because the quota was fully harvested. With the emergency action in place, the Commission had time to develop an interstate FMP, which prevented the undermining of the federal FMP and prevented further overharvest of the coastwide spiny dogfish population. Needing additional time to complete the interstate FMP, the ASMFC extended the emergency action twice through January 2003. During that time, the majority of spiny dogfish landings were from state waters because states had either no possession limits or less conservative possession limits than those of the federal FMP. The Interstate FMP for Spiny Dogfish was approved by ASMFC in November 2002 and was implemented for the 2003-2004 fishing year.

The management plan strives to promote stock rebuilding and management of the spiny dogfish fishery in a manner that is biologically, economically, socially, and ecologically sound. To achieve this, the FMP objectives are to reduce fishing mortality and rebuild the spawning stock biomass to prevent recruitment failure and support a more sustainable fishery; coordinate management activities between state, federal, and Canadian waters to ensure complementary regulations throughout the species range; minimize regulatory discards and bycatch; allocate the available resource in a biologically sustainable manner that is equitable to all fishers; and to obtain biological and fishery related data from the federal bottom trawl survey.

The interstate FMP establishes a target fishing mortality rate (F) of 0.03 and an F threshold of 0.11. The F rates were updated by the 43 SAW/SARC and are currently  $F_{\text{rebuild}} = 0.11$  and  $F_{\text{Target}}$

= 0.39. Additional reference points are based on the female spawning stock biomass (SSB) and are established based on survey units from the NEFSC spring trawl survey; target SSB = 31 kg/tow (167,000 metric tonnes(mt)) and threshold  $\frac{1}{2}$  SSB = 15.5 kg/tow (83,500 mt). After evaluating the annual status of the stock, fishing year specifications are recommended by the Technical Committee and approved by the Management Board. Annual specifications include a commercial quota and separate possession limits for two seasonal periods (Period 1: May 1 – October 30; Period 2: November 1 – April 30). The annual quota is split by a fixed percentage between the two periods: Period 1 = 57.9%; Period 2: 42.1%. The percent split is based upon historical landings during the two periods. The interstate FMP prohibits finning in state waters.

There are a few ways in which the interstate FMP differs from the federal FMP. The interstate FMP deducts quota overages from the same period in the following fishing year, and allows for 5% quota rollovers (once the stock rebuilds to the target SSB). In addition, the interstate FMP mandates that states may issue special permits for biomedical and research only and limits the number of dogfish that can be taken under the special permit to 1,000 fish. Dogfish harvested for dissection or educational purposes can be taken from the commercial quota until it is fully harvested.

In November 2005, the Spiny Dogfish and Coastal Sharks Management Board approved Addendum I to the Interstate FMP for Spiny Dogfish. Addendum I provides the Board with the authority, but not the requirement, to establish spiny dogfish specifications for up to five years. The Mid-Atlantic and New England Fishery Management Councils took similar action under Framework 1, recommending the adoption of multi-year management measures without the requirement of annual review to NOAA Fisheries for final approval. Framework 1 to the federal Spiny Dogfish FMP, which will allow the specification of commercial quotas and other management measures for up to five years, became effective February 21, 2006.

Addendum II, approved October 2008, established regional quotas in place of the previous seasonal system. Under Addendum II, the annual quota is divided regionally with 58% allocated to the states of Maine to Connecticut, 26% allocated to the states of New York to Virginia, and the remaining 16% allocated to North Carolina. The Board allocated a specific percentage to North Carolina because spiny dogfish are not available to their fishermen until late into the fishing season when most of the quota has already been harvested. The North Carolina allocation will allow fishermen and processors to plan fishing operations based on a specific amount of dogfish. Regional overage paybacks were also included in Addendum II to maintain the conservation goals of the plan. Any overage of a region and/or state quota will be subtracted from that region/state the subsequent fishing year.

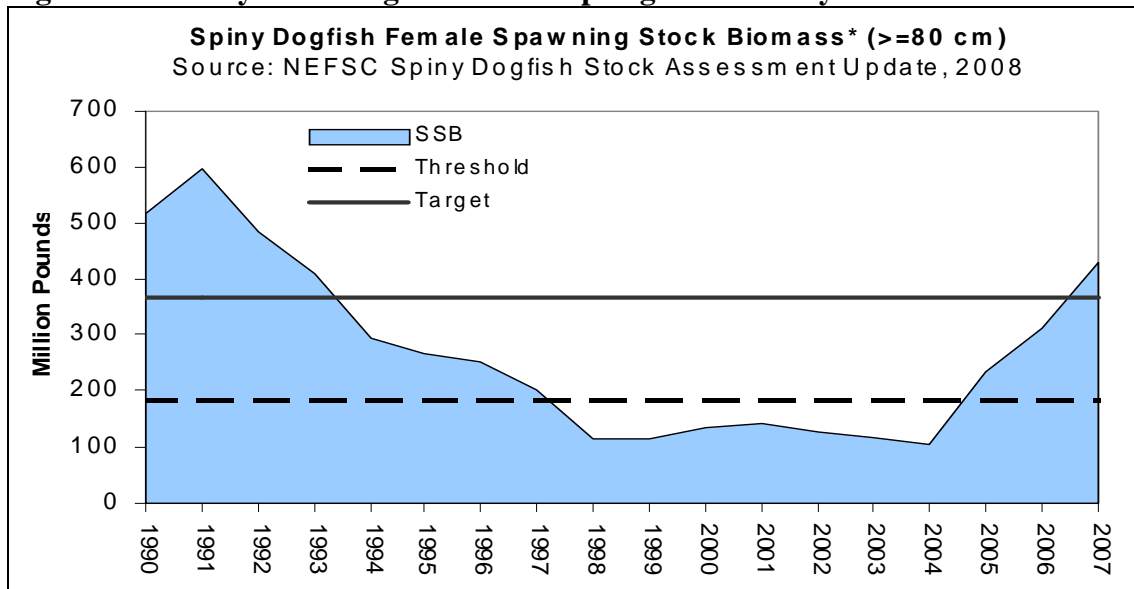
## **II. Status of the Stocks**

Atlantic stocks of spiny dogfish are not overfished, and have rebuilt to a level above the target SSB (167,000 mt) based on an update conducted by the Northeast Fisheries Science Center in 2008 that estimates SSB to be 194,600 mt (Figure 1). The Technical Committee reviewed the assessment and agreed that SSB is at a value greater than  $SSB_{target}$ , but cautioned that the determination of rebuilt status is based on current levels of stock abundance and SSB is projected to decline sharply around 2017 due to a persistent trend of low recruitment that began in 1997

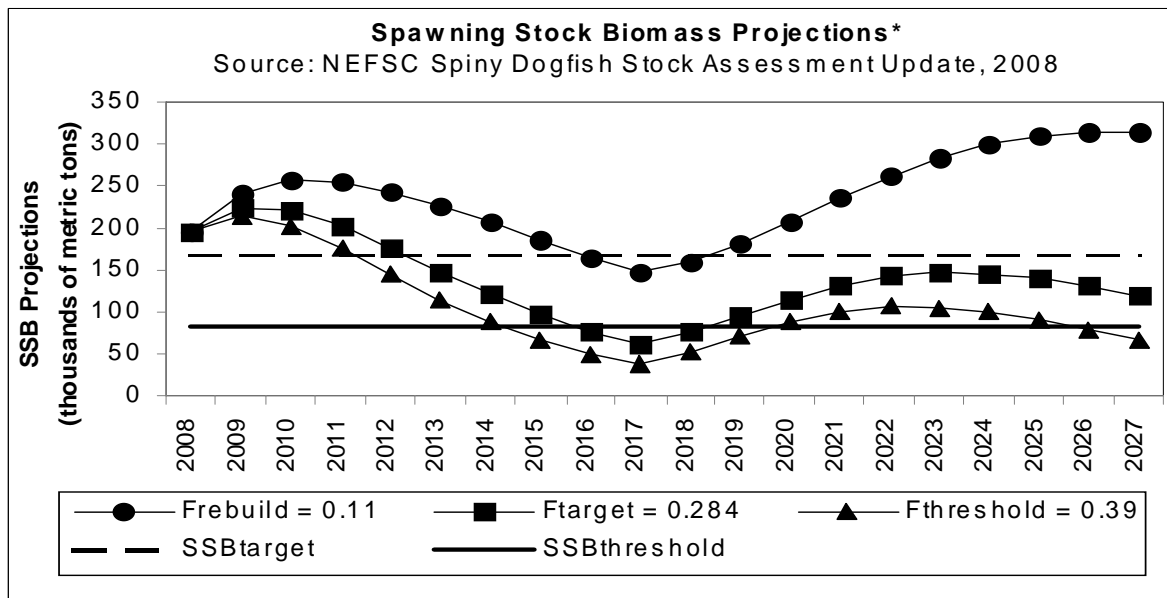
(Figure 2). The Technical Committee stressed that the assessment model uses assumptions about pup survivorship that may overestimate SSB.

Overfishing did not occur in 2007 based on the 2008 NEFMC update.  $F_{rebuild} = 0.11$  and the 2007  $F$  is estimated to average 0.1104.

**Figure 1. Three-year average of NEFSC spring trawl survey estimate.**



**Figure 2. SSB projections 2008 – 2027.**



The most recent benchmark assessment is the 43rd Northeast Regional Stock Assessment Workshop, Stock Assessment Review Committee consensus summary of assessments (43 SAW/SARC). This assessment was updated by the NEFSC to include data from the 2007 spring bottom trawl survey in late 2007.

The 43 SAW/SARC report estimated spiny dogfish SSB to be 106,180 mt in 2005. The 43<sup>rd</sup> SAW also updated the fishing mortality threshold value ( $F_{\text{Threshold}}$ ) to 0.39 (previously 0.11) and the rebuilding threshold ( $F_{\text{rebuild}}$ ) to 0.11 (previously .03) which corresponds to the fishing mortality rate where net reproductive rate (or lifetime pups per recruit) equals one. In 2005 the fishing mortality rate was 0.128, a value well below  $F_{\text{Threshold}}$  and close to  $F_{\text{rebuild}}$ .

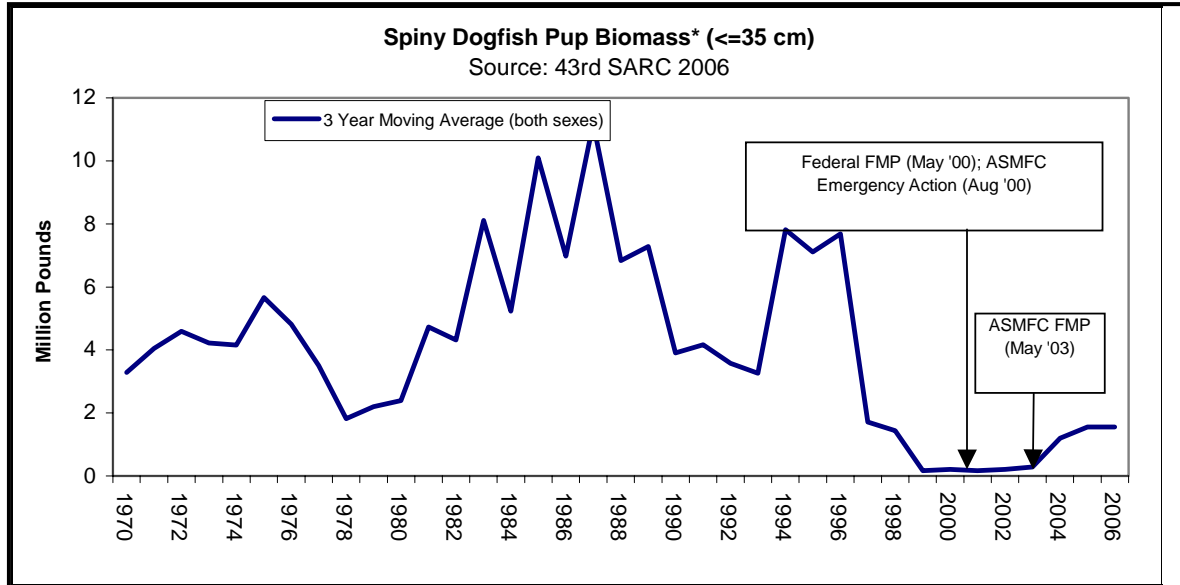
A stochastic model was used that adjusts for variability inherent in trawl surveys and takes a three-year average using data from the previous and subsequent year in the 43 SARC/SAW to calculate (SSB), and total population biomass. This is a different method (deemed more accurate by the SAW/SARC committee) than the index based three-year moving average used to calculate SSB in previous stock assessments.

Spawning Stock Biomass was 106,180 mt in 2005, which is a 144% increase from 2004 (47,719 mt). The difference between the 2005 and 2006 survey estimates is not biologically reasonable based on life history traits of spiny dogfish; either the 2006 estimate is too high, or the 2005 estimate is too low. The 2007 NEFSC update estimate of 141,350 m mt suggests that the 2002-2005 SSB numbers may be low.

The Interstate FMP for spiny dogfish uses female SSB to set ‘target’ (167,000 mt or 368 million pounds) and ‘threshold’ (83,500 mt or 184 million pounds) criteria.

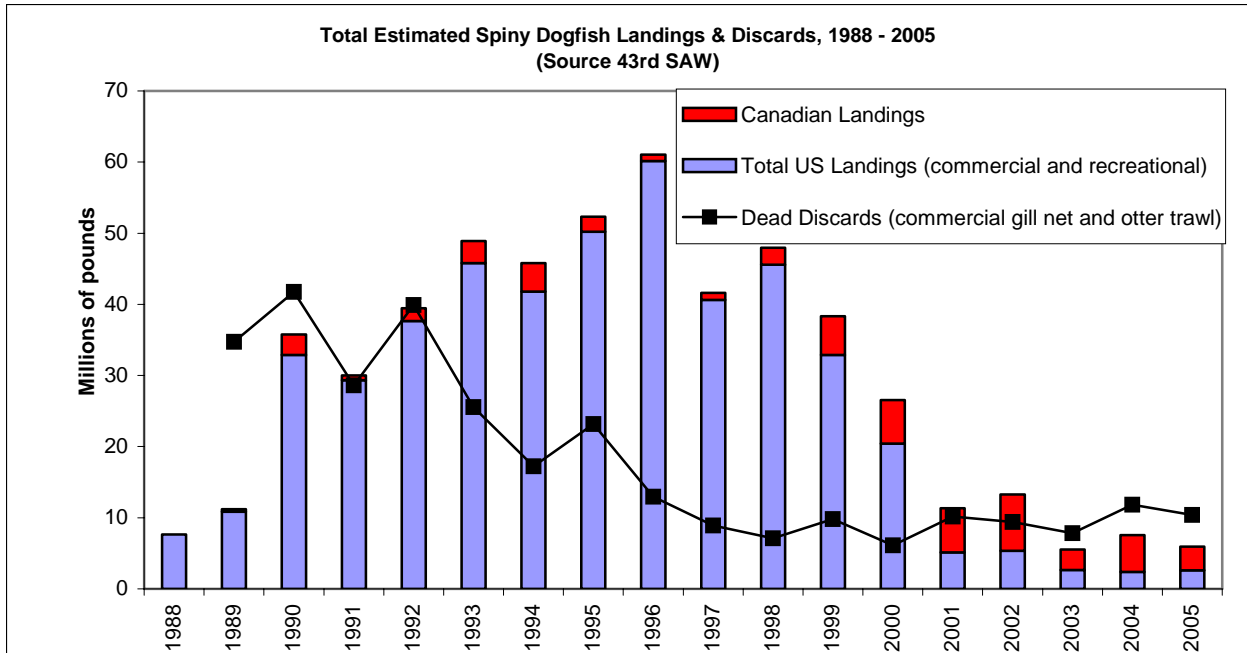
To address the variability in the survey values, all pup biomass estimates are presented as three-year *moving* averages, which were calculated incorporating the previous 2 years data. Minimum footprint three-year moving average values represent the best available science since stochastic model output data were unavailable for pup biomass.

Using a three-year moving average, the 2006 pup biomass is 1.5 million pounds (70,000 mt) (Figure 3). This number is consistent with 9 years of low pup biomass numbers when compared to the previous 26 years data. The 2005 and 2006 pup biomass three year moving averages are identical and bring the 2006 SSB numbers into question as well. In terms of raw data, the 2006 SSB number (506.4 million lbs or 253,200mt) is an almost five-fold increase from the 2005 number (111.6 million lbs or 55,800 mt). Such a large increase in spawning females would likely coincide with some increase in pup numbers for that year, but estimated pup biomass decreased by almost half from 2005 to 2006.



**Figure 3. Three-year moving average of NEFSC spring trawl survey estimate**

The spiny dogfish fishery escalated in the early 1990s. During this time, Canadian landings were historically quite low. Canadian landings began to increase in 1998 as US regulations were implemented (Figure 4). These landings dropped slightly in 2003, increased again in 2004, and dropped by roughly 41 percent in 2005 (the 2005 Canadian numbers have not yet been finalized). In 2005, Canadian commercial landings in Atlantic Canada are preliminary determined to be 2,270 metric tonnes ([http://www.dfo-mpo.gc.ca/communic/statistics/commercial/landings/seafisheries/s2005pq\\_e.htm](http://www.dfo-mpo.gc.ca/communic/statistics/commercial/landings/seafisheries/s2005pq_e.htm)) and for 2006 preliminary landings for the Atlantic region are 2,417 mt ([http://www.dfo-mpo.gc.ca/communic/statistics/commercial/landings/seafisheries/s2006pq\\_e.htm](http://www.dfo-mpo.gc.ca/communic/statistics/commercial/landings/seafisheries/s2006pq_e.htm)).

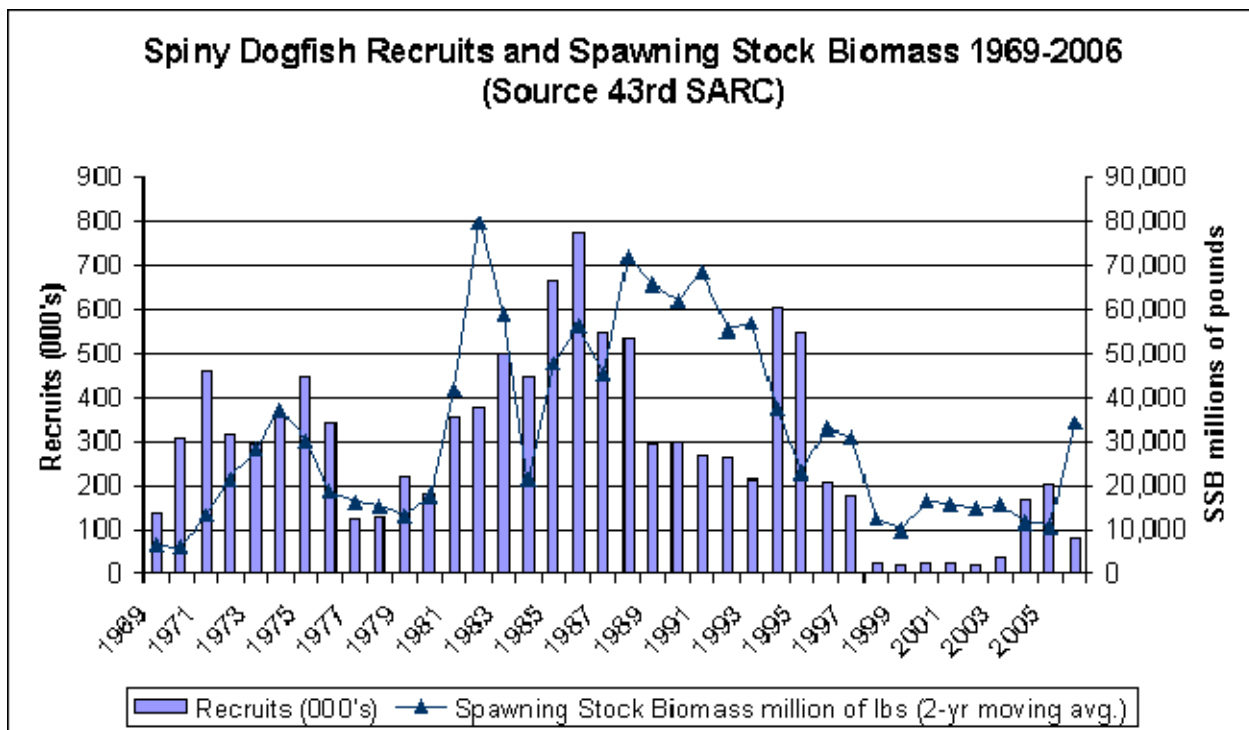


**Figure 4. Comparison of spiny dogfish landings (millions of pounds) with dead discards.**

Spiny dogfish are caught in a wide variety of fisheries and due to their low price per pound and the need for special handling procedures onboard, they are often discarded when more valuable species are present. High rates of dogfish bycatch and discards are expected. Using a ratio-estimator method, dead discards in US commercial fisheries were estimated to be 10.3 million pounds (4,714 mt) in 2005 (Figure 3).

Fishery-specific projected mortality rates are important parameters for estimating dead discards. The 43<sup>rd</sup> SAW reviewed mortality of discards for each fishery. Trawl mortality is likely higher due to compression of fish in the tow. If the catches are light, the dogfish are robust. The 43<sup>rd</sup> SAW determined discard mortality rates of 0.3 and 0.5 for gillnets and otter trawls respectively based on various scientific studies.

Recruitment numbers remain low, dropping from 20,213,000 new recruits in 2005 to 8,330,000 recruits in 2006—a 59 percent reduction (Figure 5). The 43<sup>rd</sup> SAW cited an increasingly skewed sex ratio of the population (7:1 males:females) and smaller sized reproductive females (that produce fewer, smaller offspring) as the cause for low recruitment despite increases in total and spawning stock biomass over the past few years.



**Figure 5. Estimated recruitment of spiny dogfish, <36 cm, NEFSC spring survey (2-year moving average of SSB deemed most appropriate method for comparison of recruitment by 43<sup>rd</sup> SAW).**

Fishermen frequently encounter high densities of spiny dogfish, creating the perception of a healthy biomass of dogfish. Evidence from the trawl survey data suggests that these encounters happen because dogfish are frequently distributed inshore. The fraction of the population in inshore waters does appear to have increased in recent years.



### III. Status of the Fishery

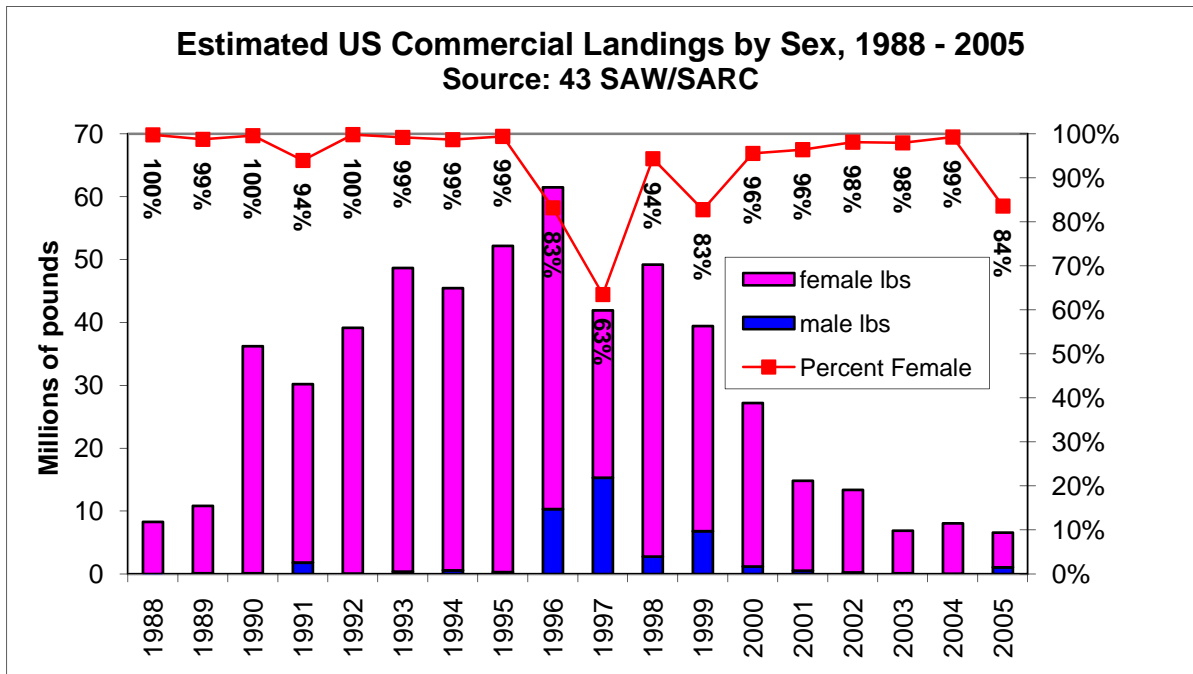
The majority of spiny dogfish are taken by the commercial fishery. The 2008/2009 overall quota of 8,000,000 pounds was allocated with 4,640,000 pounds (58%) to states from Maine – Connecticut (Northern Region), 2,080,000 pounds (26%) to New York – Virginia (Southern Region), and 2,080,000 pounds (16%) to North Carolina. The Northern quota was not exceeded and the Southern and North Carolina quotas were exceeded by 387,104 and 141,006 pounds respectively (Table 1). Massachusetts (3,496,379 pounds, 41.1%), Virginia (2,281,117 pounds, 26.8%), and North Carolina (1,421,006 pounds, 16.8%) landed the greatest amounts of dogfish during the 2008/2009 fishing season.

**Table 1. Commercial Landings by state and region from May 1, 2008 – April 30, 2009. From NERO Weekly Quota Monitoring Website and NC State Compliance Report.**

	Commercial Landings 2008/2009 Season	Regional Landings	Regional Allocation	Overage
ME	43,996	4,613,662	4,640,000	no
NH	827,350			
MA	3,496,379			
RI	236,842			
CT	9,095			
NY	25,910	2,467,104	2,080,000	387,104
NJ	48,909			
DE	0			
MD	111,168			
VA	2,281,117			
NC	1,421,006	1,421,006	1,280,000	141,006

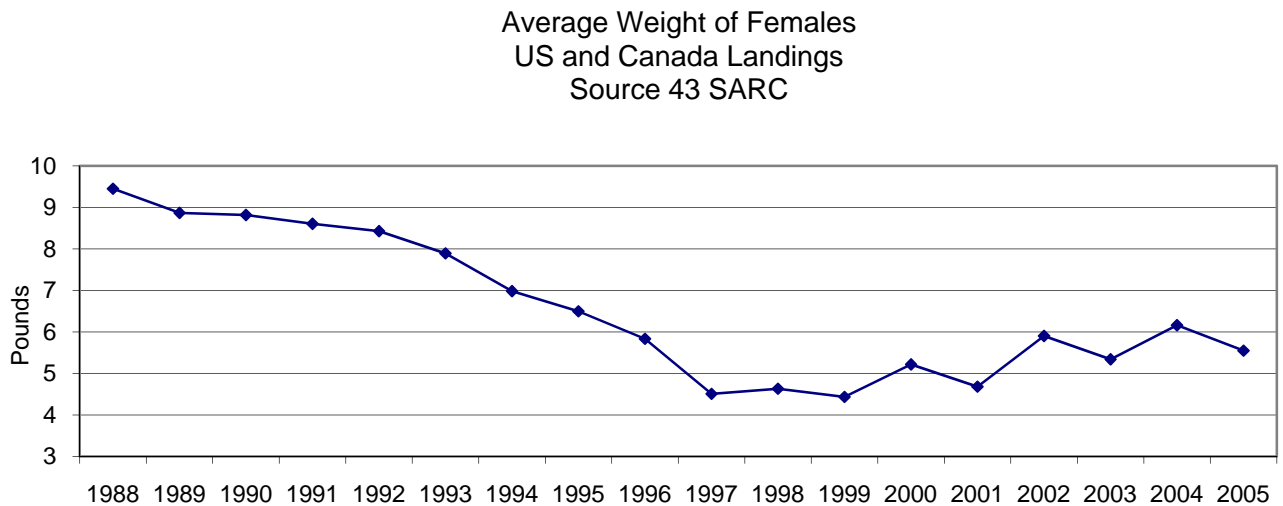
Recreational landings were unavailable past 2005. The most comprehensive landings information is from the 43 SAW/SARC as follows.

US commercial landings of spiny dogfish in 2005 were 2.53 million pounds (1150 mt). In 2004, the commercial fishery landed 2 million pounds (981 mt). Total landings are 83.5 percent female in 2005. This is showing a 12-15% decrease when compared to the last five years and is in line with numbers in 1996, 1997, and 1999 (Figure 6).



**Figure 6. Commercial landings (millions of pounds) of spiny dogfish by sex.**

The average weight of females caught in the US and Canadian commercial fisheries has decreased from 6.1 pounds in 2004 to 5.4 pounds in 2005 (Figure 7). The general trend since 1997 shows a slight increase in the average size of females; however, these average weights are significantly lower than those during the first part of the time series.



**Figure 7. Average weight of female spiny dogfish caught in US and Canadian commercial fisheries**

#### **IV. Status of Assessment Advice**

Atlantic stocks of spiny dogfish are not overfished, and have rebuilt to a level above the target SSB (167,000 mt) based on an update conducted by the Northeast Fisheries Science Center that estimates SSB to be 194,600 mt. The Technical Committee reviewed the assessment and agreed that SSB is at a value greater than  $SSB_{target}$ , but cautioned that the determination of rebuilt status is based on current levels of stock abundance and SSB is projected to decline sharply around 2017 due to a persistent trend of low recruitment that began in 1997. The Technical Committee stressed that the assessment model uses assumptions about pup survivorship that may overestimate SSB.

Overfishing did not occur in 2007 based on the 2008 NEFMC update.  $F_{rebuild} = 0.11$  and the 2007 F is estimated to average 0.1104.

A joint Canadian/US Transboundary Resource Assessment Committee (TRAC) data workshop was conducted in early April and the assessment and review workshop is scheduled for January 25, 2009. The TRAC is a benchmark assessment.

#### **V. Status of Research and Monitoring**

Under the Interstate Fishery Management for Spiny Dogfish, the states are not required to conduct any fishery dependent or independent studies. The Interstate FMP requires an annual review of recruitment, spawning stock biomass, and fishing mortality. The annual review relies heavily on the NEFSC's spring trawl survey data to determine the annual status of the stock.

States are encouraged to submit any spiny dogfish information collected while surveying for other species. Research and monitoring information from each state's report is as follows. Please see individual reports for more information.

Spiny dogfish abundance has been monitored in the Connecticut Long Island Sound Trawl Survey since 1984. Spring (April, May and June) and fall (September and October) surveys are conducted each year. Spiny dogfish are most consistently taken in the spring portion of the survey with between 0 and 123 fish caught per survey. Dogfish were more commonly taken in the early years of the survey (between 14 and 123 fish per survey from 1985 through 1991). Fewer than 10 fish per year were taken in 8 of the last 15 years. No spiny dogfish were taken during the spring survey in 1995, 1996 and 2000. The 2008 spring survey catch was 35 fish.

There are currently no fishery independent monitoring programs in New Jersey specific to the spiny dogfish. However, all spiny dogfish collected during the Department's Ocean Stock Assessment Program trawl survey are weighed, measured and sexed (sexed since 2007). This data was recently forwarded to the National Marine Fisheries Service for inclusion in the April 2009 Transboundary Resources Assessment Committee Workshop on spiny dogfish.

Delaware has two fisheries independent surveys that have the potential for taking spiny dogfish. The first is a 30-foot bottom trawl that was deployed monthly in Delaware Bay at nine fixed stations from March through December in 2008. These surveys have been conducted annually since 1990, and before that from 1966 – 1971 and 1979 – 1984 using essentially the same gear type. A total of 104 spiny dogfish was taken in 2008 in 90 tows of this gear, and most of these

(53) were taken in April with the others being taken in May (20), November (17), December (13) and October (1).

The second fishery independent survey that has the potential for taking spiny dogfish is the 16-foot bottom trawl which is deployed monthly at 39 fixed stations in Delaware's Inland bays. This survey is conducted from April through October. This gear includes a 0.5-inch mesh liner in the cod end of the trawl and it targets primarily juvenile fishes. There were no spiny dogfish taken with this gear in 2008 from either the Delaware Bay or Delaware's Inland Bays. See Delaware's state compliance report for more information.

There is no specific at sea sampling program for spiny dogfish in Maryland. There was limited biological sampling of commercial catch onboard commercial offshore trawlers. On December 8 – 9, 2008, samples were collected on board a commercial trawler targeting horseshoe crabs and summer flounder, respectively, using a standard summer flounder bottom trawl with a 15.24 cm (6.0 inch) mesh body, with a 13.97 cm (5.5 inches) cod end. Dogfish were measured and sexed if present in the sub-sampled catch.

In December 2008, 36 spiny dogfish were measured and sexed from catches in state and federal waters. Females accounted for 34 dogfish and two were males. Female and male fish lengths ranged in size from 650 mm TL (26 in.) to 951 mm TL (37 in.; Figure 1) and averaged 818 mm TL ( $\pm 12$ ; 32 in.) with a mode of 800 mm (31.5 in.).

There are currently no fishery-dependent sampling programs in Virginia that target spiny dogfish for collection from the commercial fishery. The intercept component of the MRFSS program interviews anglers to collect demographic information and individual catch data. The raw intercept files demonstrate few spiny dogfish have been encountered during surveys of Virginia recreational anglers. In 2008, MRFSS interviewers observed only three spiny dogfish of Type A catch (landings) and no spiny dogfish of Type B1 catch (discards) in Virginia (NMFS, Fisheries Statistics and Economics Division, Silver Spring, MD, pers. comm.). There were 55 spiny dogfish of Type B2 (released alive) reported. The small number of spiny dogfish observed resulted in imprecise estimates of recreational fishery statistics for Virginia in 2008 (see Section III.D.2, this report). The low number of spiny dogfish encountered in Virginia intercept interviews has persisted since the start of the survey in 1981. Since then, annual sample sizes ranged from 0 to 30 spiny dogfish of Type A catch, from 0 to 13 spiny dogfish of Type B1 catch, and from 0 to 165 of Type B2 catch.

The MRFSS program also conducts at-sea sampling surveys of headboat fishing trips. These surveys are the only source of biological data characterizing discarded catch (Type 9) that are collected by the MRFSS. MRFSS observers reported there were 21 spiny dogfish discarded during headboat surveys in Virginia in 2008 (NMFS, pers. comm.).

There are currently no fishery-independent surveys in Virginia that observe sufficient quantities of spiny dogfish to be considered adequate for monitoring species trends.

Fishery dependent sampling of North Carolina commercial fisheries has been ongoing since 1982 (conducted under Title III of the Interjurisdictional Fisheries Act and funded in part by the

US Department of Commerce, National Marine Fisheries Service). Predominate fisheries sampled included the ocean gill net fishery, estuarine gill net fishery, winter trawl fishery, long haul seine/swipe net fisheries, beach haul seines and pound net fisheries. The ocean gill net fishery is responsible for the majority of the spiny dogfish landings in North Carolina. Spiny dogfish were sampled from 21 ocean gill net catches in the 2008/2009 fishing year. Fishing efforts ranged from northeast of Oregon Inlet to Hatteras and Ocracoke Inlets. A total of 1579 fish were measured and ranged in lengths from 70 to 100 cm total length (TL) with a mean of 86 cm TL. Catches were constrained by trip limits and low demand due to limited market opportunities.

Spiny dogfish were sampled on the January 28- February 7, 2009 SEAMAP Cooperative Striped Bass Tagging Cruise. Sampling occurred generally in near shore ocean waters from Ocracoke Inlet, NC to Southeast Virginia. Spiny dogfish captured in each tow were enumerated by sex and a subsample was measured. A total of 2,602 spiny dogfish were observed. The male to female ratio was 97% females. A total of 27,274 have been tagged off Northeast NC and Southeast VA since spiny dogfish sampling began in 1996. This year, 2009, was the first year sonic transmitters were implanted in spiny dogfish. Fifty fish were surgically implanted with transmitters and released between Cape Hatteras and the North Carolina-Virginia border. The spiny dogfish work conducted on this cruise was in cooperation with the Mid-Atlantic Fishery Management Council, the National Marine Fisheries Service-Northeast Fisheries Science Center, the North Carolina Division of Marine Fisheries and East Carolina University. No other fishery-independent sampling by the NCDMF catches a significant number of spiny dogfish.

NCDMF initiated a fisheries independent gill net survey in 2001. The objective of this project is to provide annual, independent, relative-abundance indices for key estuarine species in the Pamlico Sound. These indices can also be incorporated into stock assessments and used to improve bycatch estimates, evaluate management measures, and evaluate habitat usage. Results from this project will be used by the NCDMF and other Atlantic coast fishery management agencies to evaluate the effectiveness of current management measures and to identify additional measures that may be necessary to conserve marine and estuarine stocks. Developing fishery independent indices of abundance for target species allows the NCDMF to assess the status of these stocks without relying solely on commercial and recreational fishery dependent data. The survey employs a stratified random sampling design and utilizes multiple mesh gill nets (3.0 inch to 6.5 inch stretched mesh, by ½ inch increments). Catches of spiny dogfish in this survey are minimal. During the 2008/2009 fishing year, a total of 82 spiny dogfish were captured in the survey. They ranged from 51 to 97 cm TL with an average of 86 cm TL in 2008 and 77 to 91 cm TL with an average of 85 cm TL in February and March of 2009.

The SCDNR's State Finfish Survey documents recreational fisheries landings through a coast-wide creel survey. Landings data related to spiny dogfish in South Carolina waters since 1993 indicate only ten sharks landed, with almost all having been released. In addition the South Carolina Marine Game Fish Tagging Program occasionally records data associated with the tagging of spiny dogfish. The largest annual numbers for spiny dogfish landings reported occur in the recreational Charterboat Logbook Program data.

The SCDNR's on-going Nearshore Bottom Longline Survey Program documents the annual presence of spiny dogfish in South Carolina's nearshore coastal waters, typically beginning in mid-November. Relative abundance and residence time of spiny dogfish along the coast in general may be related primarily to winter water temperatures along the east coast, with colder winters resulting in larger spiny dogfish populations and longer residence times in South Carolina waters than in more temperate years. Adult females, many being pregnant, seem to make up a majority of the fish taken by sampling gear in this program, suggesting that South Carolina waters may play a role as valuable over-wintering grounds for this species. (SCDNR POC: frazierbr@dnr.sc.gov)

## **VI. Status of Management Measures and Issues**

### **Interstate Specifications for the 2008/2009 fishing season**

The Spiny Dogfish and Coastal Sharks Management Board final specifications for the 2008-2009 fishing season included a commercial quota of 8 million pounds with maximum possession limits of 3,000 lbs (Table 2). The quota was allocated with 4,640,000 pounds (58%) to states from Maine – Connecticut (Northern Region), 2,080,000 pounds (26%) to New York – Virginia (Southern Region), and 2,080,000 pounds (16%) to North Carolina. Overages will be deducted from the 2009/2010 fishing season regional quotas.

### **Canadian Regulations**

Canada continues to hold their regulations constant while the Department of Fisheries and Ocean (DFO) completes their five-year spiny dogfish research program. The fixed gear (less than 45 feet) sector is the only group permitted to actively fish for spiny dogfish in eastern Canada. The fixed gear fishery is allotted a 2,500 mt (~5.5 million pounds) quota. This quota is further divided among the different community management boards based on catch history and can be transferred among the communities. The inshore and offshore dragger fleets are permitted to retain bycatch in the amount of 25 mt for vessels less than 65 feet and vessels larger in size have an annual cap of 10 mt.

The 2007-2008 fishing year is the fifth year of the five-year sampling program. The sampling program is industry funded and collects information such as size, sex, and age. Thus far, sampling has raised questions regarding the assumption that spiny dogfish is a single stock. The DFO has committed a 2,500 mt quota to the fixed gear sector at least until the end of the five year sampling program. Canada has declined to participate in a transboundary assessment until DFO has an initial assessment of the stock in Canadian waters.

In the April 2002 - March 2003 fishing year, Canada had a 2,500 mt quota for the fixed gear sector plus a 700 mt sampling quota; total Canadian landings were 3,408.6 mt (including mobile gear landings). In the 2003-2004 fishing year, the fixed gear fishery landed only 1,270 mt of the 2,500 mt quota. Total landings, with mobile gear landings, were 1,277.2 mt. In 2005, Canadian commercial landings are projected to be 3.3 million pounds (1500 mt).

## **Biomedical Harvest**

Maine was the only state to request an allowance to issue biomedical permits for the 2007/2008 fishing year. They issued 4 permits as follows:

**1. DMR Aquarium:** The DMR operates a public aquarium at its Boothbay Harbor laboratory facility. The Marine Resources Aquarium received 7 spiny dogfish during the 2008 season from two different sources.

Five spiny dogfish were obtained from the Marine Biological Lab in Woods Hole.

Specimens: Female – ~36” in length  
Female – ~36” in length  
Female – ~40” in length  
Male - ~ 50” in length  
Male - ~ 50” in length

Two spiny dogfish were obtained by DMR.

Specimens: 1 female and 1 male – length unknown.

**2. Mount Desert Biological Labs:** From June 25 – August 29, 2008, a total of 500 spiny dogfish were collected from Maine coastal waters. Of the 500 total dogfish collected, 227 were females and 273 were males. Average weights ranged from 1.41 to 1.97 kg. All dogfish received were used for biomedical research at MDIBL.

## **CITES**

In late December 2003, Germany submitted a proposal to list spiny dogfish, *Squalus acanthias*, in Appendix II of the Convention on International Trade of Endangered Species (CITES). An Appendix II listing means the species can be exported commercially under a system of international permits, sustainability determinations, and cooperative law enforcement. The purpose of such a listing is to ensure that a species does not become endangered because of international trade. The CITES Animal Committee determined that spiny dogfish meets the biological criteria for Appendix II. After the Animal Committee meeting, Germany failed to garner sufficient support from other European Union countries and thus could not submit the proposal during the next CITES conference (Convention of the Parties 13: Bangkok October 3 – 14, 2004).

On December 19, 2006, European Union Member States agreed to support Germany's proposals to provide protection for spiny dogfish sharks under the Convention on International Trade in Endangered Species. Following debate at the European Commission's CITES Committee, the proposals received the qualified majority needed to advance to the Conference of the Parties to CITES in June 2007.

At the Convention on International Trade in Endangered Species (CITES) there were insufficient votes put in place controls on trade of spiny dogfish.

In August 2009, the US Fish & Wildlife Service requested comment on a proposal to list spiny dogfish in Appendix II of CITES at CoP15 in March 2010.

## **VII. Annual State Compliance**

The mandatory components of the Interstate Fishery Management Plan require states to close the fishery when the commercial quota is projected to be harvested, report landings weekly to NMFS, state permitted dealers must report weekly, implement possession limits as determined by the Commission's annual specification setting process, limit the biomedical harvest of spiny dogfish to 1,000 fish (per state ) per year, and report the amount of dogfish harvested under special permits, and maintain a prohibition on finning.

Table 2 summarizes the states' compliance with the Interstate Fishery Management Plan for spiny dogfish during the 2007/2008 fishing year and provides an update on the regulations for the current fishing year.

## **VIII. PRT Recommendations**

### **State Compliance**

All of the states with a declared interest in the management of spiny dogfish who submitted reports, have regulations in place that are compliant with the Interstate Fisheries Management Plan for Spiny Dogfish. Maine DMR intends to review applications and potentially issue exempted fishing permits in 2009.

### **De minimis Status**

When the spiny dogfish Interstate FMP was implemented in 2003, Maine, Delaware, South Carolina, Georgia, and Florida were granted *de minimis* status. To achieve *de minimis* status the FMP requires, "a state's commercial landings of spiny dogfish to be less than 1% of the coastwide commercial total." When given *de minimis* status, a state is exempted from biological monitoring of the commercial spiny dogfish fishery, but must continue to report both commercial and recreational spiny dogfish landings.

Delaware, South Carolina, Georgia, and Florida are requesting *de minimis* status for the 2008/2009 fishing year and continue to meet the FMP requirements for achieving this status. The PRT recommends granting all of these states *de minimis* status.

### **Other Issues**

Several states have regulations that mirror federal regulations including possession limits and closures. Under Addendum II, the ASMFC specifies regional quotas while the NMFS uses a seasonal allocation of quota. In addition, the ASMFC plan includes a payback provision which reduces a regions quota the following year in the case of an overage. There is no requirement that the Board and NMFS must set identical quota amounts.

The differences between state and federal management allow for the possibility that federal waters may remain open when state waters are closed to landing. Under such a scenario, states that default to the federal regulations would be out of compliance with the ASMFC FMP if they do not prohibit landing when a regional quota is projected to be harvested.



**Table 2. State-by-state compliance with the Interstate Fishery Management Plan for Spiny Dogfish. Period 1 is May 1 – October 31. Period II is November 1 – April 30**

	Report Submitted	De Minimis Request	Biomedical Permit Harvest	Finning Prohibition	Possession limits
<b>Maine</b>	Yes	No	Yes: 500 Collected	Yes	3,000 lb
<b>New Hampshire</b>	Yes	No	No	Yes	3,000 lb
<b>Massachusetts</b>	Yes	No	No	No	600 lb: May 1 – Aug. 30 2,000 lb: Sep. 1 –Dec 31
<b>Rhode Island</b>	Yes	No	No	Yes	2,000 lb
<b>Connecticut</b>	Yes	No	No	Yes	600 lb
<b>New York</b>	Yes	No	No	Yes	600 lb
<b>New Jersey</b>	Yes	No	No	Yes	600 lb
<b>Delaware</b>	Yes	Yes, Recommended	No	Yes	600 lb
<b>Maryland</b>	Yes	No	No	Yes	3,000 lb
<b>Virginia</b>	Yes	No	No	Yes	3,000 lb
<b>North Carolina</b>	Yes	No	No	Yes	3,000 lb
<b>South Carolina</b>	Yes	Yes, Recommended	No	Yes	600 lb <sup>1</sup>
<b>Georgia</b>	Yes	Yes, Recommended	No	Yes	1 fish bag limit / 30" min size
<b>Florida</b>	Yes	Yes, Recommended	Protected Species	Protected Species	Protected Species

<sup>1</sup> South Carolina regulations pertaining to shark fishing in general require fishermen to follow federal regulations except where specific state legislation is enacted. There are no dogfish specific regulations for spiny dogfish in South Carolina.

## **Research Recommendations**<sup>2</sup>

1) Attempt to allocate landings to statistical area (i.e. attempt proration) using Vessel Trip Report data for 1994 and later years.

*The Working group successfully completed work to address this RR.*

2) Evaluate the utility of length frequency for spiny dogfish sampled in the NEFSC Observer Program in the most recent years (2001 and later).

*The Working group successfully completed work to address this RR.*

3) Ensure the inclusion of recent (2000 and later) MADMF Observer sample data for spiny dogfish in the NEFSC database, for more efficient use in future assessments.

*The Working group successfully completed work to address this RR.*

4) Conduct tagging and genetic studies of spiny dogfish in U.S. and Canadian waters to clarify current assumptions about stock structure.

*The Working Group reviewed an ongoing tag project conducted by East Carolina University.*

5) Conduct discard mortality studies for spiny dogfish, with consideration of the differences in mortality rates among seasons, areas, and gear types.

*The Working Group reviewed a discard mortality study in North Carolina near-shore trawl and gillnet fisheries conducted by East Carolina University, and took these results into consideration in updating assumed discard mortality rates for the coast-wide trawl, gillnet, and hook fisheries.*

6) Conduct experimental work on NEFSC trawl survey gear performance, with focus on video work to study the fish herding properties of the gear for species like dogfish and other demersal roundfish.

*The Working Group made no progress on this RR.*

7) Investigate the distribution of spiny dogfish beyond the depth range of current NEFSC trawl surveys, possibly using experimental research or supplemental surveys.

*The Working Group made no progress on this RR. 43rd SAW Assessment Report 53*

8) Initiate aging studies for spiny dogfish age structures (e.g., fin spines) obtained from NEFSC trawl surveys and other sampling programs. These studies should include additional age validation and age structure exchanges. The WG notes that other aging methodologies (e.g., Canadian studies on radiometry) are also in development.

*The Working Group reviewed preliminary results of NEFSC aging work for spiny dogfish. Preliminary results agree more with validated ages for Pacific dogfish, then with current estimates used for Northwest Atlantic dogfish.*

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<sup>2</sup> Taken Verbatim from the 43<sup>rd</sup> SAW section 11.0 "SPINY DOGFISH RESEARCH RECOMMENDATIONS".

9) Additional analyses of the effects of environmental conditions on survey catch rates should be conducted.

*The Working Group investigated the associations of temperature and depth with trawl survey densities. Examination of dogfish distributions in trawl surveys indicates greater concentrations closer to shore over the last five years.*

10) Additional work on the stock-recruitment relationship should also be conducted with an eye toward estimation of the intrinsic rate of population increase.

*The Working Group used the results from a new analytical model (LTM) to estimate parameters of a stock-recruitment relationship.*

11) The SARC noted that the increased biological sampling of dogfish should be conducted and research trawl surveys. Maturation and fecundity estimates by length class will be particularly important to update. Additional work on the survey database to recover and encode information on the sex composition prior to 1980.

*The Working group notes that a sampling program to collect aging structures (2003) and maturity data (1998) for dogfish has been implemented on NEFSC surveys. The WG examined sex composition data from NEFSC spring and fall surveys from 1968 to 1972, and this historical information has been included in this assessment.*

**New:**

1) Incorporate Canadian commercial fishery sample data into the assessment when it is made available (expected in 2008).

2) Conduct an aging workshop for spiny dogfish, encouraging participation by NEFSC, NCDMF, Canada DFO, other interested state agencies, academia, and other international investigators with an interest in dogfish aging (US and Canada Pacific Coast, ICES).

3) Examine observer data to calculate a weighted average discard mortality rate based on an assumption that the rate increases with catch size.

4) Develop experimental estimates of discard mortality in the New England and Mid-Atlantic commercial fisheries.

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5) Develop experimental estimates of discard mortality in the New England and Mid-Atlantic recreational fisheries.

6) Conduct a coast-wide tagging study for spiny dogfish to explore stock structure, migration patterns, and mixing rates.