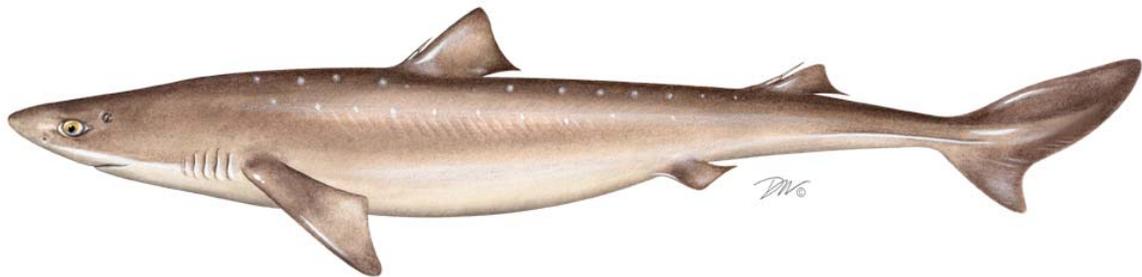


**REVIEW OF THE
INTERSTATE FISHERY MANAGEMENT PLAN FOR
SPINY DOGFISH
(*Squalus acanthias*)**



**May 2007 – April 2008 FISHING YEAR
Board Approved: May 2009**

Prepared by the Spiny Dogfish Plan Review Team:
Christopher Vonderweidt, ASMFC, Chair
Tina Moore, NCDMF
Greg Skomal, MADMF

I. Status of the Fishery Management Plan

Date of FMP Approval: November 2002

Date of Addendum I Approval: November 2005

Management Unit: Entire coastwide distribution of the resource from the estuaries eastward to the inshore boundary of the EEZ

States With Declared Interest: Maine - Florida

Active Boards/Committees: 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 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. $F_{\text{rebuild}} = 0.11$ and the 2007 F is estimated to average 0.1104.

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 43rd SAW also updated the fishing mortality threshold value ($F_{\text{Threshold}}$) to 0.39 (previously 0.11) and the rebuilding threshold (F_{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_{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. The current SSB of 312 million lbs (141,350 mt) falls between the threshold and target values (Figure 1).

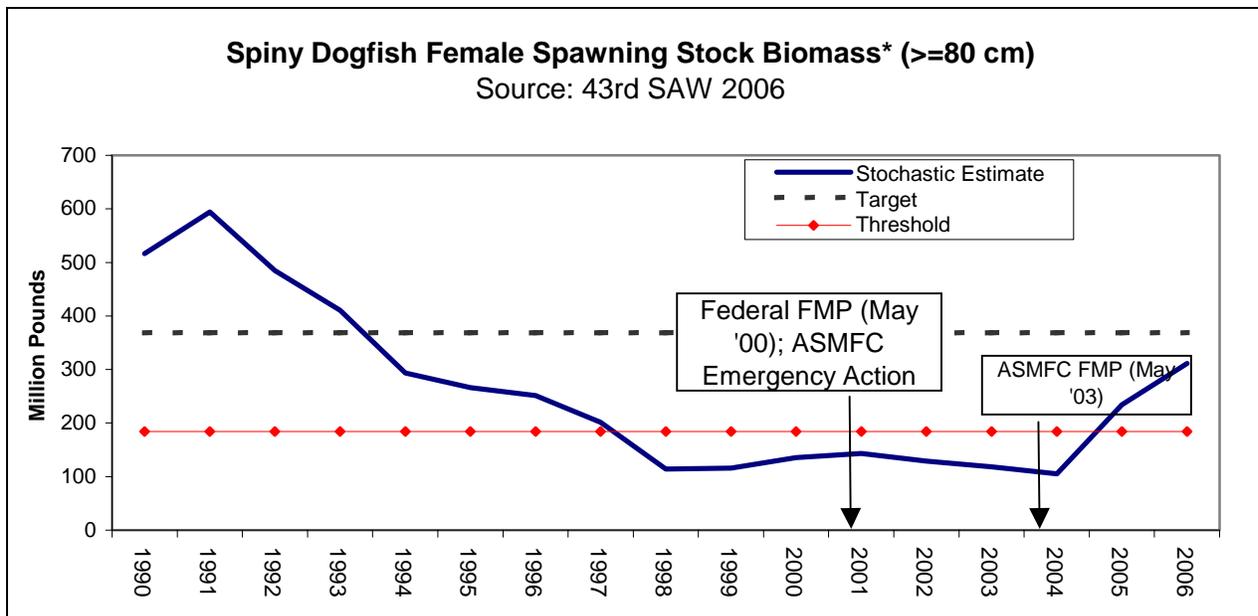


Figure 1. Three-year average of NEFSC spring trawl survey estimate.

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 2). 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.

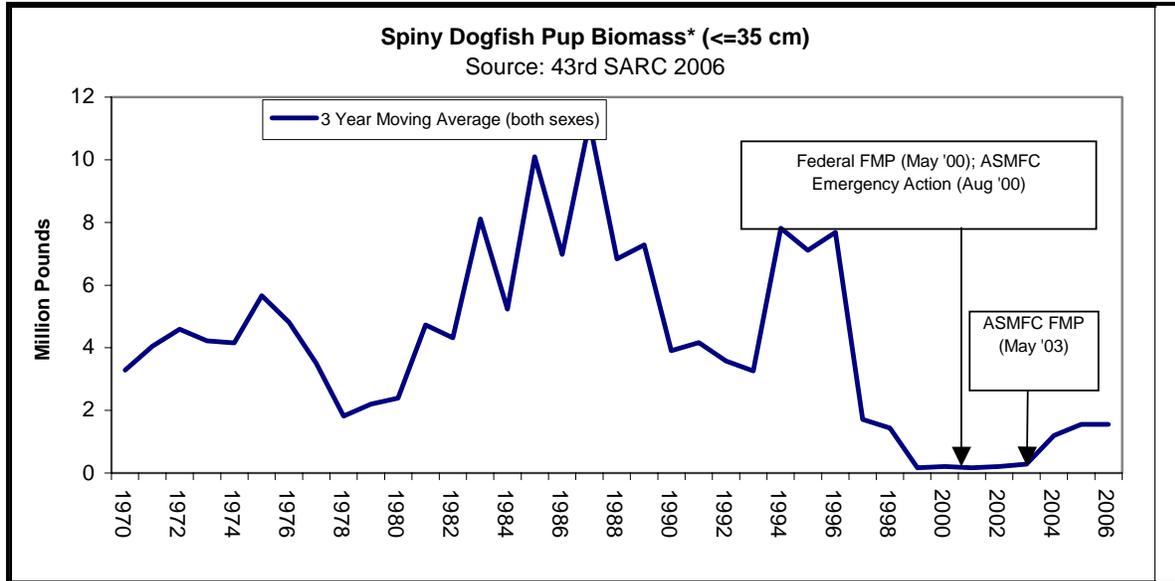


Figure 2. Three-year moving average of NEFSC spring trawl survey estimate

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 3). 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) 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).

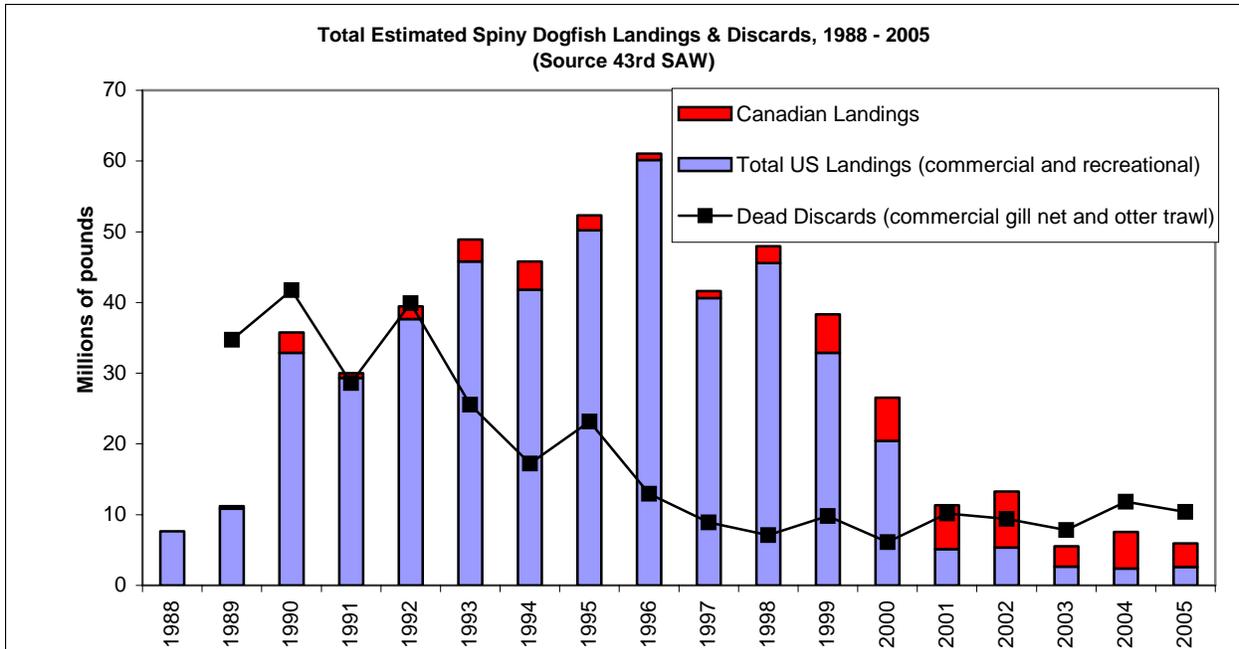


Figure 3. Comparison of spiny dogfish landings (millions of pounds) with dead discards.

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 43rd 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 43rd 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 4). The 43rd 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.

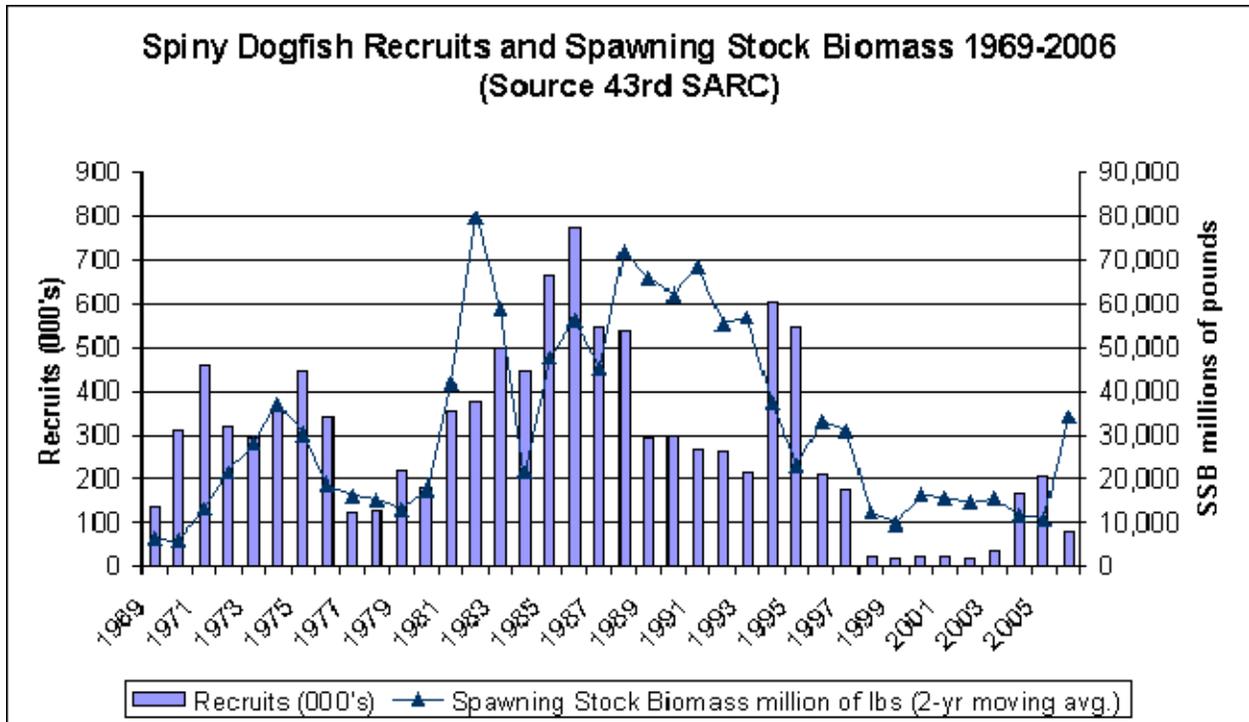


Figure 4. Estimated recruitment of spiny dogfish, <36 cm, NEFSC spring survey (2-year moving average of SSB deemed most appropriate method for comparison of recruitment by 43rd SAW).

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

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 5). Landings in 2006 by sex are unavailable. See Table 1 for 2007/2008 estimated commercial landings data.



Figure 5. 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 6). 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.

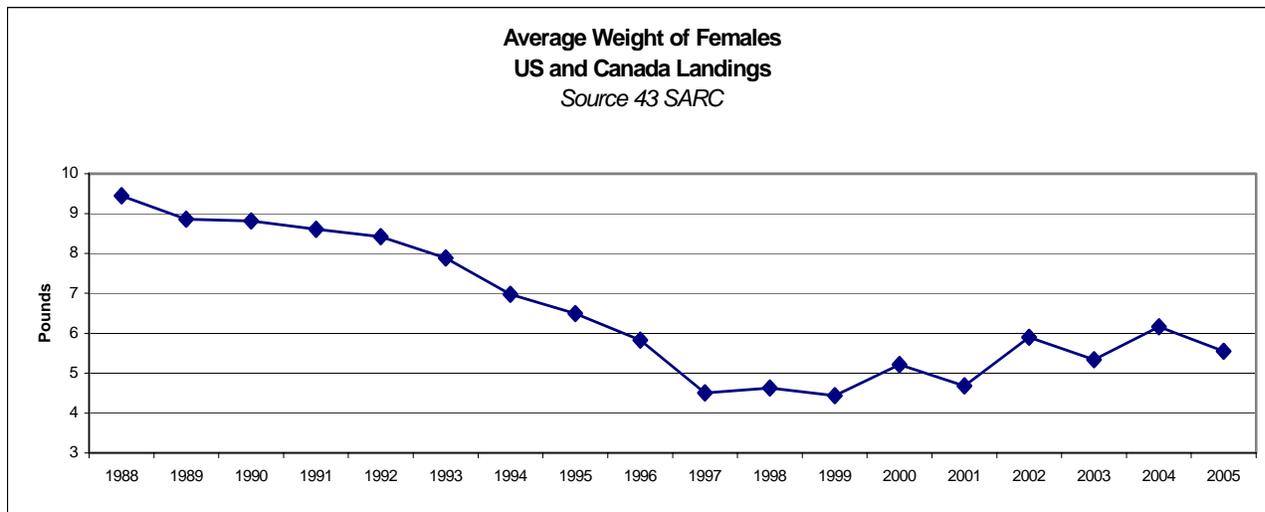


Figure 6. Average weight of female spiny dogfish caught in US and Canadian commercial fisheries

Recreational landings are minimal when compared with commercial landings. Massachusetts, New Jersey, Delaware, and Maryland landed the majority of recreationally caught spiny dogfish (Table 1).

Table 1. State Recreational and Commercial Landings (in pounds). Recreational landings from MRFSS website <http://www.st.nmfs.gov/st1/>; Commercial landings from NERO weekly quota and monitoring reports http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm

State	Recreational Landings (2007)		Commercial Landings (May 2007 – April 2008)	
	MRFSS Lbs (A1 + B1 + B2)	% of Coastwide Recreational Catch	NOAA Weekly Quota Management Report	% OF Coastwide Commercial Catch
Maine	0	0.00%	108,275	1.86%
New Hampshire	7,308	8.94%	184,818	3.17%
Massachusetts	13,090	16.01%	2,802,972	48.08%
Rhode Island	869	1.06%	522,779	8.97%
Connecticut	983	1.20%	22,681	0.39%
New York	0	0.00%	24,859	0.43%
New Jersey	19,982	24.45%	10,869	0.19%
Delaware	19,233	23.53%	34	0.00%
Maryland	17,161	20.99%	23,068	0.40%
Virginia	730	0.89%	2,001,591	34.33%
North Carolina	2,383	2.92%	127,747	2.19%
South Carolina	0	0.00%	0	0.00%
Georgia	0	0.00%	0	0.00%
Florida	0	0.00%	0	0.00%
	81,739		5,829,693	

Massachusetts landed the largest percentage (48%) of the coastwide commercial catch during the 2007/2008 fishing season followed by Virginia (38%) and Rhode Island (8%) (Table 1, Figure 7).

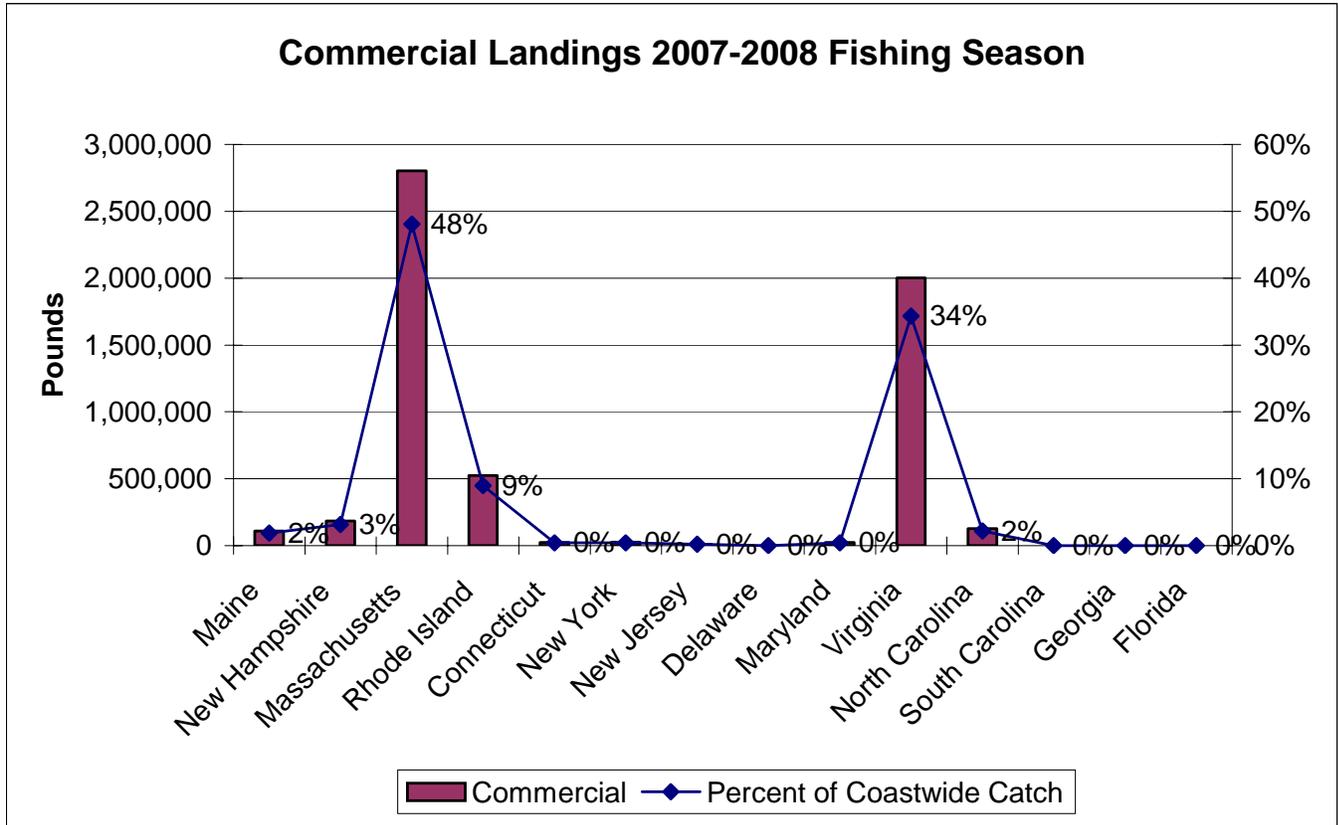


Figure 7. Commercial landings (pounds) for 2007/2008 fishing year by state. Source: NERO Weekly Quota Monitoring Report Archives.

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) benchmark assessment is scheduled for 2009.

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.

There is no specific at sea sampling program for spiny dogfish in Maryland. There is limited biological sampling of commercial catch onboard commercial offshore trawlers. On November 14 and December 19, samples were collected aboard a commercial trawler targeting horseshoe crabs and summer flounder, respectively, using a standard summer flounder bottom trawl net with a 15.24 cm (6.0 inch) mesh net body, with a 13.97 cm (5.5 inches) cod end. Dogfish were measured and recorded if present in the sub-sampled catch.

In 2007, 66 spiny dogfish were measured and sexed from catches in state and federal waters. Females accounted for 55 specimens, four were males, and sex was not determined for seven fish. Sampled fish lengths ranged in size from 705 mm TL (28 in.) to 999 mm TL (39 in.; Figure 1) and averaged 817.5 mm TL (± 17 ; 32 in.) with a mode of 810 mm (32 in.).

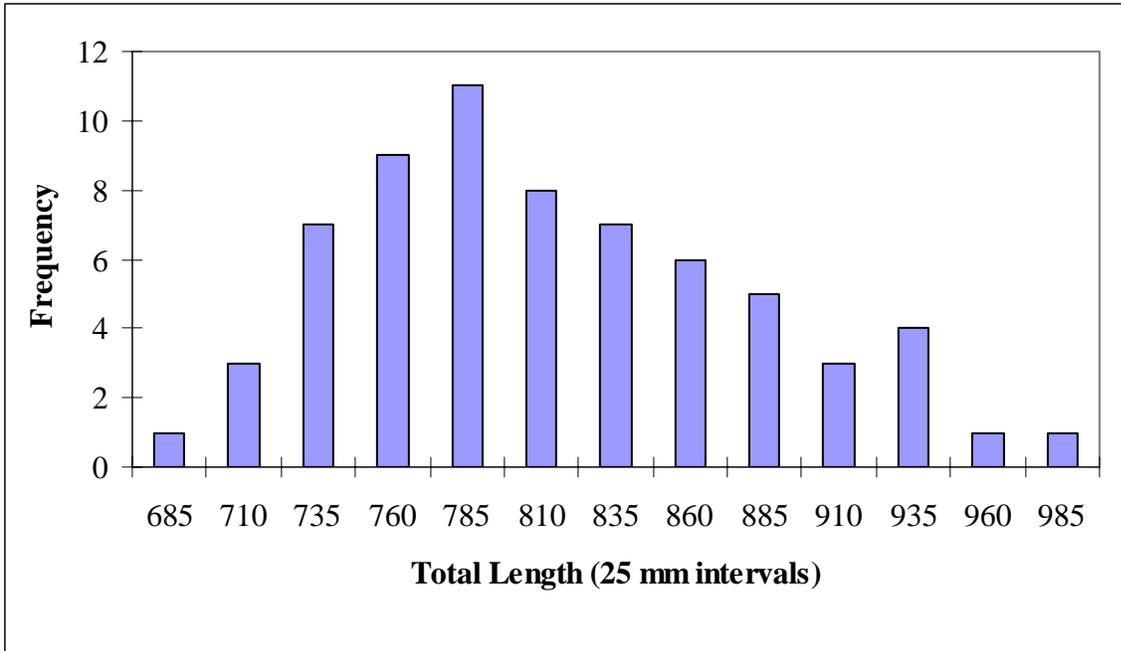


Figure 8. Length histogram of spiny dogfish (*Squalus acanthias*) subsampled from commercial trawl operations offshore from Ocean City, Maryland during November and December 2007, n = 66.

Females comprised 83% of the samples and averaged 837 mm TL (± 17 mm; 33 in.) with a mode of 810 mm in TL (32 in; Figure 2). Males made up 6% of the sampled spiny dogfish and were shorter on average (742 mm TL (± 39 ; 29 in.) when compared to the females (Figure 2).

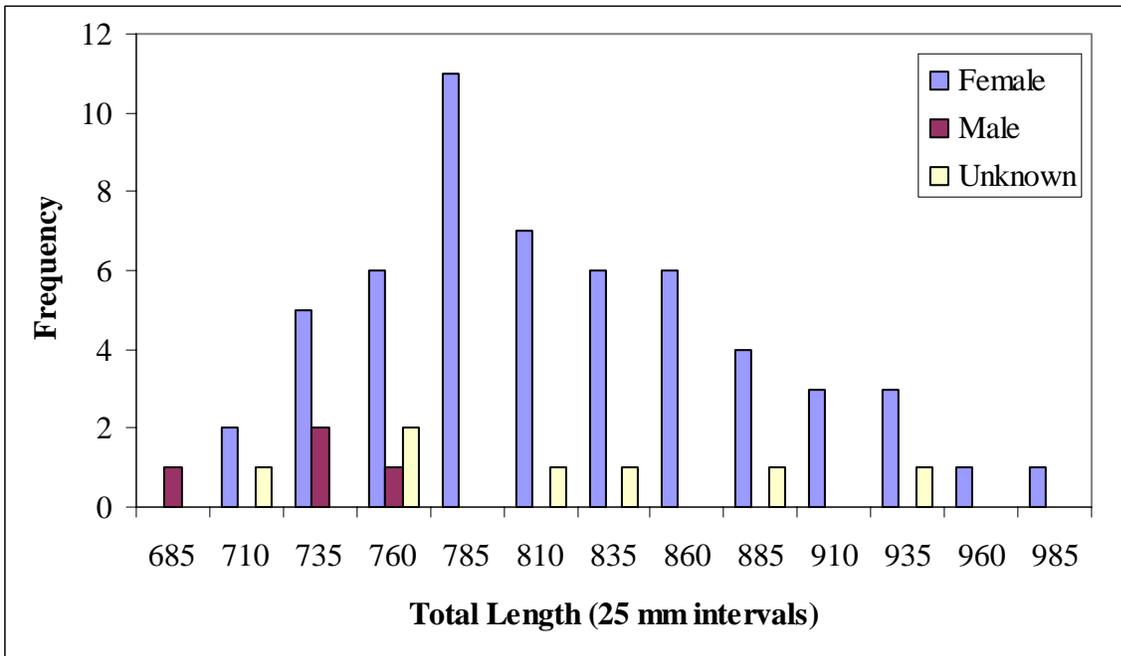


Figure 9. Length histogram of commercial spiny dogfish (*Squalus acanthias*) subsampled from commercial trawl operations offshore from Ocean City, MD from May 2007 through April 2008 by sex, n=66. Gender was not determined for seven fish.

Connecticut has a spring and fall trawl survey that encounters spiny dogfish. From 1985 to 1991, the trawl survey commonly caught spiny dogfish in the spring, but has caught fewer than 11 fish per year for the last ten years except for 2007, which produced 32 fish.

Delaware has two fishery independent surveys that have the potential for capturing spiny dogfish. A total of 78 spiny dogfish were taken in 2007 in 90 tows, 38 were taken in April 36 were taken in December and 4 were taken in May.

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 include 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 2007/2008 fishing year. Fishing effort ranged from northeast of Oregon Inlet to Hatteras and Ocracoke Inlets. A total of 545 fish were measured and ranged in lengths from 72 to 100 cm total length (TL) with a mode of 85 cm TL. Catches were constrained by trip limits and low demand due to limited market opportunities.

Spiny dogfish were sampled on the January 13-25, 2008 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 8,569 spiny dogfish were observed. The male to female ratio was 0.14 to 1.0. Although, no spiny dogfish were tagged during the 2008 cruise, a total of 27,274 have been tagged off Northeast NC and Southeast VA since spiny dogfish sampling began in 1996. 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. There is no other fishery-independent sampling by the NCDMF that 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 that can 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 inch to 6 ½ inch stretched mesh, by ½ inch increments). Catches of spiny dogfish in this survey are minimal. During the 2007/2008 fishing year, a total of 10 spiny dogfish were captured in the survey. They ranged from 80 to 95 cm TL and averaged 89 cm TL.

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 2007-2008

The Spiny Dogfish and Coastal Sharks Management Board final specifications for the 2006-2007 fishing season included a commercial quota of 6 million pounds with maximum possession limits of 3,000 lbs (Table 2).

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 17 spiny dogfish during the 2007 season from three different sources.

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

Specimens: Female – ~36” in length
Female – ~36” in length
Female – ~36” in length
Female - ~ 38” in length
Female - ~ 40” in length
Female - ~ 42” in length

Three female spiny dogfish were transferred to the Herring Gut Learning Center – lengths unknown.

Six spiny dogfish were obtained from fishermen.

Specimens: 4 females ~ 32” in length and 2 males ~ 36” in length.

Two spiny dogfish were obtained by DMR.

Specimens: 1 female and 1 male – length unknown.

2. Mount Desert Biological Labs: From July 13, 2007 – September 19, 2007, a total of 565 spiny dogfish were collected from Maine coastal waters. Of the 565 total dogfish collected, 144 were females and 421 were males. Average weights ranged from 1.38 to 1.84 kg. All dogfish received were used for biomedical research at MDIBL.

4. DMR Inshore Trawl Survey: During two inshore DMR trawl surveys, a total of 3,381 dogfish were collected from Maine coastal waters. Of these, 1706 were females and 1675 were males. The length distribution ranged from 24 to 96 centimeters. All dogfish were returned to sea.

5. Shoals Marine Lab: During 2007, there were 0 spiny dogfish collected at the Shoals Marine Laboratory.

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.

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 2008.

The only state with a significant management change during the 2007/2008 fishing season was Delaware. Delaware revised the spiny dogfish state regulations and re-opened the spiny dogfish commercial fishery. Even with the season being re-opened, there was no commercial harvest of spiny dogfish reported through fishermen logbooks. The NMFS Statistics Division Quota Monitoring website reports a total of 34 pounds of dogfish landed in Delaware (Table 1).

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. Eight states qualified for *de minimis*

Delaware, South Carolina, Georgia, and Florida are requesting *de minimis* status for the 2007/2008 fishing year and continue to meet the FMP requirements for achieving this status. The PRT recommends granting all of these states *de minimis* status.

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
Maine	Yes	No	Yes: 582 Collected	Yes	3,000 lb
New Hampshire	Yes	No	No	Yes	3,000 lb
Massachusetts	No	No	No	No	600 lb: May 1 – Aug. 30 2,000 lb: Sep. 1 –Dec 31
Rhode Island	Yes	No	No	Yes	3,000 lb
Connecticut	Yes	No	No	Yes	600 lb
New York	Yes	No	No	Yes	600 lb
New Jersey	Yes	No	No	Yes	600 lb
Delaware	Yes	Yes, Recommended	No	Yes	600 lb
Maryland	Yes	No	No	Yes	3,000 lb
Virginia	Yes	No	No	Yes	3,000 lb
North Carolina	Yes	No	No	Yes	3,000 lb
South Carolina	Yes	Yes, Recommended	No	Yes	600 lb ¹
Georgia	Yes	Yes, Recommended	No	Yes	2 fish bag limit / 30" min size
Florida	Yes	Yes, Recommended	Protected Species	Protected Species	Protected Species

¹ 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 Recommendations²

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.

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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.

² Taken Verbatim from the 43rd 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.

