MANAGEMENT STRATEGY

To set the annual spiny dogfish quotas, an annual joint meeting between the ASMFC Technical Committee and MAFMC Monitoring Committee is held. The Technical and Monitoring committees make quota recommendations after considering discards, Canadian landings, and management uncertainty. To ensure effective management, quota recommendations are formed using fisheries data collected from the previous fishing season. These quota recommendations are then communicated to the Spiny Dogfish Management Board and MAFMC for approval. Current management targets and thresholds are below:

- $F_{msy} = 0.2439$
- SSB_{target} = 351.2 million pounds (159,288 metric tons); level of biomass that would maximize recruitment to the population (100% SSB_{max}).
- $SSB_{threshold}$ = 175.6 million pounds (79,644 metric tons); 50% of SSB_{target}

LITERATURE CITED

ASMFC (Atlantic States Marine Fisheries Commission). 2002. Interstate Fishery Management Plan For Spiny Dogfish. Atlantic States Marine Fisheries Commission. Arlington, Virginia. http://www.asmfc.org/uploads/file/spinyDogfishFMP.pdf

ASMFC (Atlantic States Marine Fisheries Commission). 2019. 2019 Review of the Atlantic States Marine Fisheries Commission Fishery Management Plan For Spiny Dogfish (squalus acanthias): 2019/2019 Fishing Year. Atlantic States Marine Fisheries Commission. Arlington, Virginia. http://www.asmfc.org/uploads/file/5dc4890aSpinyDogfishFMPReview_2019.pdf

Campana, S.E., Jones, C., McFarlane, G.A. 2006. Bomb dating and age validation using the spines of spiny dogfish (*Squalus acanthias*). In Special Issue: Age and Growth of Chondrichthyan Fishes: New Methods, Techniques and Analysis, pp. 327-336.

Campana, S.E., Joyce, W., Kulka, D.W. 2009. Growth and reproduction of spiny dogfish off the eastern coast of Canada, including references on stock structure. Biology and management of dogfish sharks, pp. 195-208.

Ketchen, K.S. 2011. Size at maturity, fecundity, and embryonic growth of the spiny dogfish (*Squalus acanthias*) in British Columbia Waters. Canadian Journal of Fisheries Research. 29(12): 1717-1723.

MAFMC (Mid-Atlantic Fishery Management Council), NEFMC (New England Fishery Management Council). 2000. Spiny Dogfish Fishery Management Plan. Mid-Atlantic Fishery Management Council. Dover, DE. https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/53e3c49ee4b08bd3408a6a50/1407435934901/Spiny_Dogfish_FMP.pdf

Nammack, M.F., Musick, J.A., Colvocoresses, J.A. 1985. Life history of spiny dogfish off the northeastern United States. Transactions of the American Fisheries Society. 114(3) 367-376.

NCDMF 2015. Fishery Management Plan for Interjurisdictional Fisheries: Information Update. North Carolina Department of Environmental Quality. North Carolina Division of Marine Fisheries. Morehead City, North Carolina. 85 pp.

Sulikowski, J.A., Galuardi, B., Bebley, W., Furey, N.B., Driggers, W.B., Ingram, G.W., Tsang, P.C. 2010. Use of satellite tags to reveal the movements of spiny dogfish *Squalus acanthias* in the western North Atlantic Ocean. Marine Ecology Progress Series. 418: 249-254.

Sosebee, K., Rago, P., Northeast Fisheries Science Center (NEFSC), National Marine Fisheries Service (NMFS). 2018. Update on the Status of Spiny Dogfish in 2017 and Projected Harvests at the F_{msy} Proxy and P_{star} of 40%. Report to the Mid Atlantic Fishery Management Council (MAFMC) Scientific and Statistical Committee (SSC) August 31, 2017. 82 pp.

TABLES

Table 1. Spiny dogfish recreational harvest and number released (NOAA Marine Recreational Information Program) and commercial harvest (North Carolina Trip Ticket Program) for 1994-2020. All weights are in pounds. Note: * represents confidential data.

	Recreational				
	Numbers		Weight (lb)		
Year	Landed	# Released	Landed	Commercial Weight (lb)	Total Weight (lb)
1994	0	1,842	0	1,234,931	1,234,931
1995	107	1,911	1,071	7,174,803	7,175,874
1996	0	2,453	0	13,210,735	13,210,735
1997	0	0	0	7,608,426	7,608,426
1998	1,645	3,229	11,308	4,961,379	4,972,687
1999	0	51,303	0	3,718,622	3,718,622
2000	0	0	0	3,549,939	3,549,939
2001	0	7,866	0	*	*
2002	0	12,167	0	*	*
2003	2,701	1,429	0	*	*
2004	0	40,336	0	522,576	522,576
2005	0	3,928	0	18,865	18,865
2006	1,402	72,255	5,718	11,574	17,292
2007	0	78,188	0	149,543	149,543
2008	0	40,842	0	158,727	158,727
2009	0	94,509	0	1,416,362	1,416,362
2010	3,613	167,231	16,556	1,708,437	1,724,993
2011	11,422	175,993	83,637	2,557,923	2,641,560
2012	1,365	176,126	9,538	2,728,882	2,738,420
2013	48,603	2,006,275	79,537	3,010,958	3,090,495
2014	1,992	598,268	11,978	5,650,285	5,662,263
2015	7,302	657,373	36,376	4,247,213	4,283,589
2016	22,611	52,562	173,584	2,271,201	2,472,840
2017	683	44,038	5,616	393,085	398,701
2018	7,514	157,394	43,732	1,168,247	1,211,979
2019	6,106	261,322	43,551	1,124,291	1,167,842
2020	1,785	31,195	13,638	1,476,402	1,490,040
Average	4,503	181,109	20,085	2,639,442	2,659,527

Table 2. Spiny dogfish length (total length, inches) data from NOAA Marine Recreational Information Program recreational samples, 1994-2020.

Year	Mean Total Length (in)	Minimum Total Length (in)	Maximum Total Length (in)	Total Number Measured
1994	0	0	0	0
1995	33	33	33	1
1996	0	0	0	0
1997	0	0	0	0
1998	31	21	32	4
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0
2002	0	0	0	0
2003	0	0	0	0
2004	0	0	0	0
2005	0	0	0	0
2006	33	30	35	4
2007	0	0	0	0
2008	0	0	0	0
2009	0	0	0	0
2010	28	25	31	2
2011	31	30	33	3
2012	33	31	33	1
2013	22	21	31	1
2014	35	12	40	1
2015	27	16	40	2
2016	35	31	38	2
2017	33	31	34	5
2018	30	25	38	11
2019	35	32	38	3
2020	32	27	38	11

Table 3. Spiny dogfish length (total length, inches) data from commercial fish house samples, 1999-2020.

Year	Mean Total Length (in)	Minimum Total Length (in)	Maximum Total Length (in)	Total Number Measured
1999	33	22	41	255
2000	33	25	41	2,636
2001	32	29	35	12
2002	30	26	32	10
2003	0	0	0	0
2004	34	27	41	1,323
2005	30	27	32	7
2006	35	30	41	92
2007	34	27	40	1,201
2008	34	29	39	545
2009	34	28	43	1,048
2010	34	28	40	843
2011	33	28	40	686
2012	34	26	42	2,461
2013	35	27	41	2,373
2014	35	26	42	2,168
2015	34	19	40	1,365
2016	34	25	40	795
2017	33	24	39	67
2018	34	27	40	380
2019	34	24	39	580
2020	33	23	41	450

Table 4. Female spiny dogfish length (total length, inches) data from commercial fish house samples, 1999-2020.

Year	Mean Total Length (in)	Minimum Total Length (in)	Maximum Total Length (in)	Total Number Measured
1999	33	22	41	235
2000	33	25	41	2,464
2001	33	31	35	7
2002	31	28	32	8
2003	0	0	0	0
2004	34	27	41	1,295
2005	30	27	32	4
2006	35	30	41	91
2007	34	29	40	1,017
2008	34	29	39	527
2009	34	28	43	994
2010	34	28	40	794
2011	34	26	394	647
2012	35	27	42	2,373
2013	35	26	41	2,285
2014	35	19	42	2,094
2015	35	25	40	1,281
2016	35	24	40	727
2017	34	29	39	53
2018	35	27	40	343
2019	35	25	39	523
2020	32	23	41	362

Table 5. Male spiny dogfish length (total length, inches) data from commercial fish house samples, 1999-2020.

Year	Mean Total Length (in)	Minimum Total Length (in)	Maximum Total Length (in)	Total Number Measured
1999	30	23	32	20
2000	30	27	38	172
2001	31	29	33	5
2002	27	26	28	2
2003	0	0	0	0
2004	31	28	36	28
2005	30	29	31	3
2006	30	30	30	1
2007	30	27	37	184
2008	31	29	37	18
2009	31	28	37	54
2010	31	28	35	49
2011	30	28	33	34
2012	30	28	35	87
2013	31	26	35	88
2014	31	25	33	74
2015	31	25	38	84
2016	30	26	35	68
2017	30	27	32	14
2018	30	27	35	37
2019	30	24	35	57
2020	29	25	37	88

FIGURES

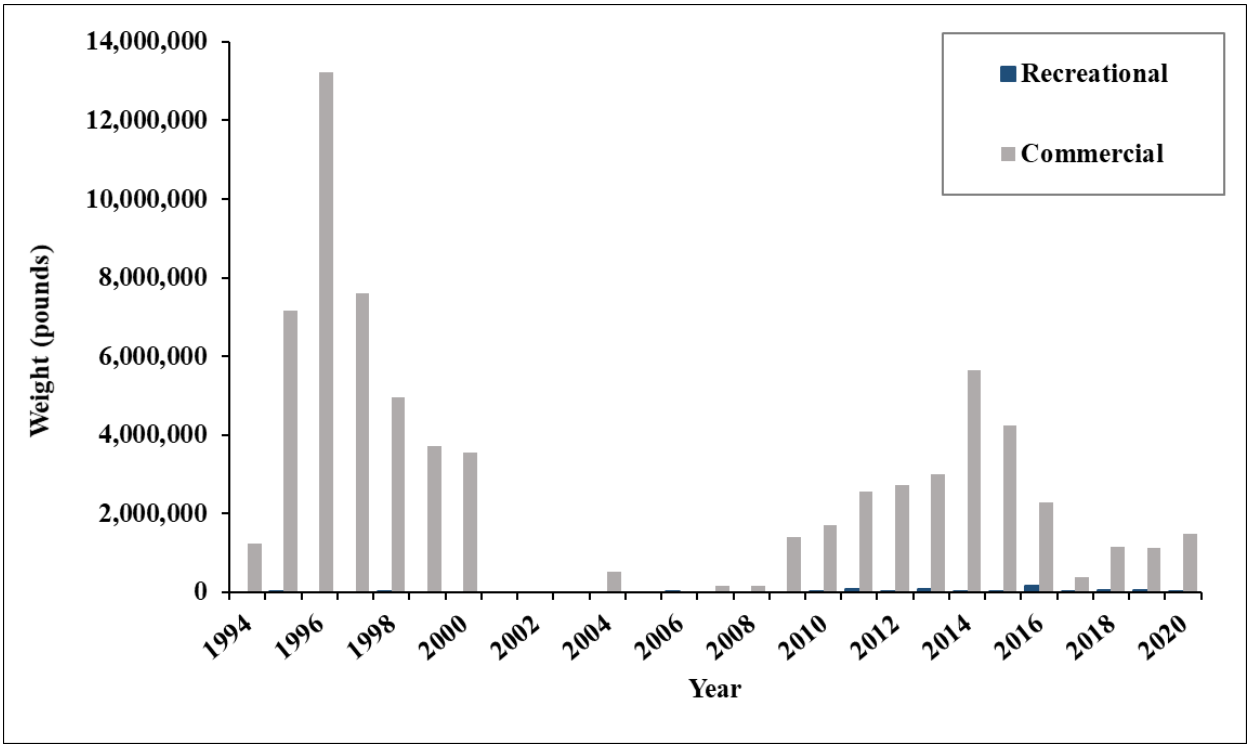

Figure 1. Annual commercial and recreational landings in pounds for spiny dogfish in North Carolina from 1994-2020. *Commercial landings data for 2001, 2002, and 2003 are confidential.

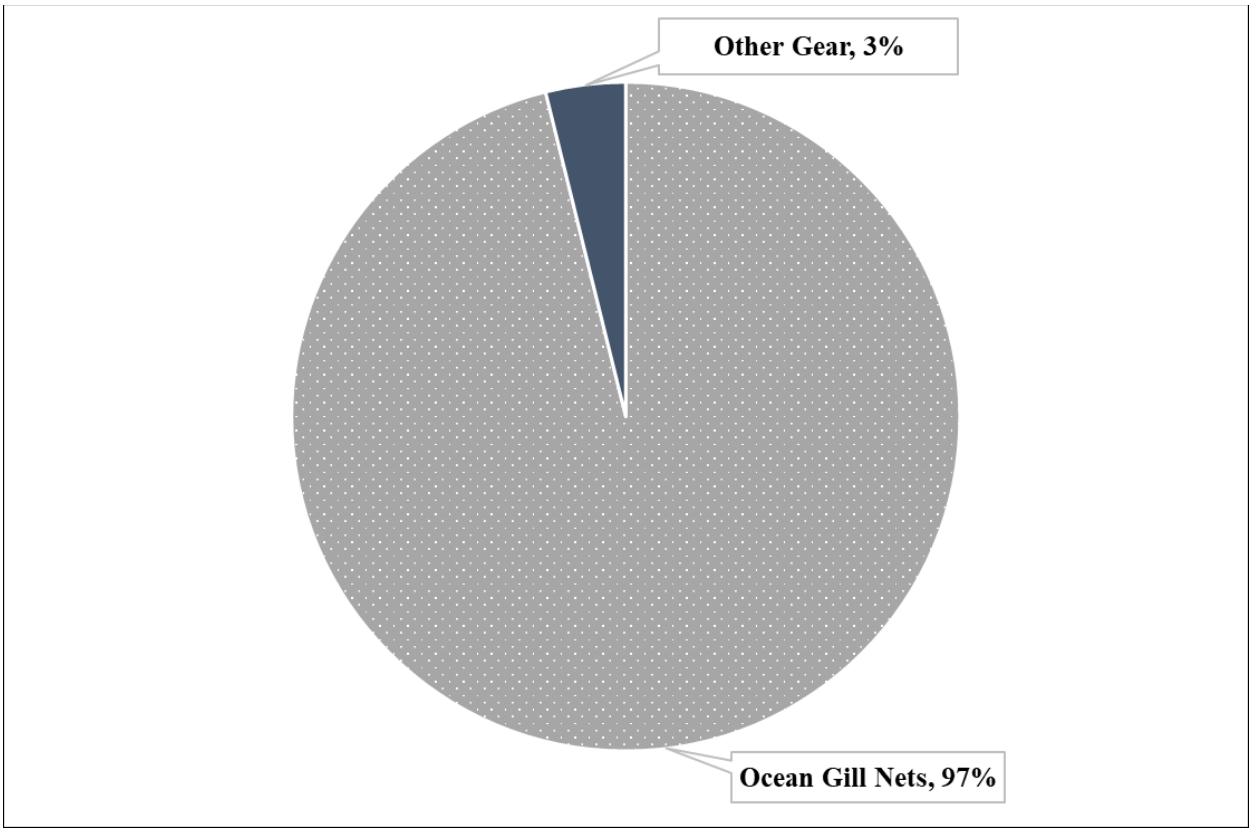

Figure 2. Commercial harvest of spiny dogfish in North Carolina by gear type in 2020.