



## Spiny Dogfish Fishery Information Document

August 2021

This Fishery Information Document provides an overview of the biology, stock condition, management system, and fishery performance for spiny dogfish (*Squalus acanthias*) with an emphasis on recent data. Data sources for Fishery Information Documents are generally from unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel trip report (VTR), permit, and Marine Recreational Information Program (MRIP) databases and should be considered preliminary. For more resources, including previous Fishery Information Documents, please visit <http://www.mafmc.org/dogfish>.

### Key Facts

- 2020 fishing year landings were about 12.8 million pounds; 2019 fishing year landings were about 19.1 million pounds.
- The current 2021 fishing year quota is 29.6 million pounds.
- The 2022 fishing year quota is planned to stay the same if no changes are recommended by the Scientific and Statistical Committee (SSC) or the Councils.
- A formal update from the NMFS Science Center is not anticipated, but we expect an update of the spring trawl survey results and pup index through 2021. The previous data update is available at [https://www.mafmc.org/s/3\\_2019-Data-Update-for-spiny-dogfish.pdf](https://www.mafmc.org/s/3_2019-Data-Update-for-spiny-dogfish.pdf).

### Basic Biology

Spiny dogfish is a coastal shark with populations on the continental shelves of northern and southern temperate zones throughout the world. It is the most abundant shark in the western north Atlantic and ranges from Labrador to Florida, but is most abundant from Nova Scotia to Cape Hatteras, North Carolina. Its major migrations on the northwest Atlantic shelf are north and south, but it also migrates inshore and offshore seasonally in response to changes in water temperature. Spiny dogfish have a long life, late maturation, a long gestation period, and relatively low fecundity, making them generally vulnerable to depletion. Fish, squid, and ctenophores dominate the stomach contents of spiny dogfish collected during the Northeast Fisheries Science Center (NEFSC) bottom trawl surveys, but spiny dogfish are opportunistic and have been found to consume a wide variety of prey. More detailed life history information can be found in the essential fish habitat (EFH) source document for spiny dogfish at: <https://www.fisheries.noaa.gov/region/new-england-mid-atlantic#science>.<sup>1</sup>

## Status of the Stock

Based on the current biomass reference point and an assessment update considering data through spring of 2018 (available at <http://www.mafmc.org/ssc-meetings/2018/sept-11>), the spiny dogfish stock is not overfished or experiencing overfishing. The 2018 biomass was 67% of the target. Fishing mortality in 2017, the most recent year available, was 83% of the overfishing threshold. A research track assessment has begun and is scheduled for review in 2022. The spiny dogfish spawning stock biomass estimate timeseries is provided in Figure 1.<sup>2</sup> Updated trawl data, which is the chief determinant of biomass in the assessment, will be distributed when available.

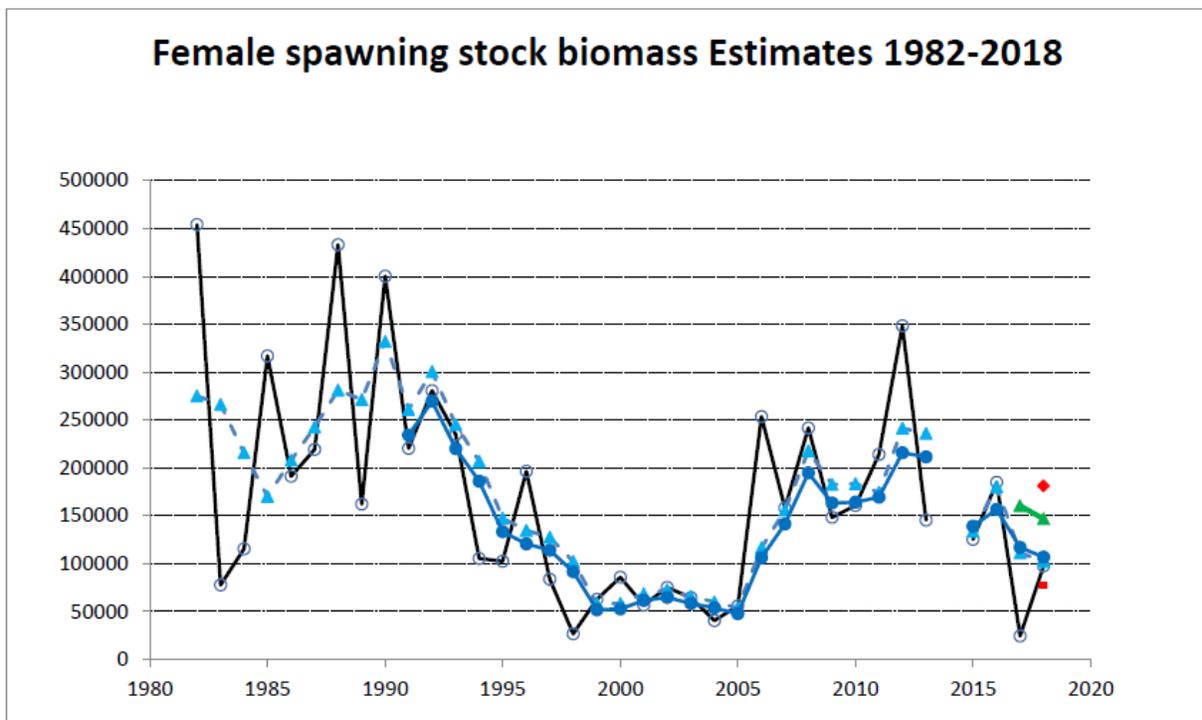


Figure 1. Stochastic SSB estimates for 1991 to 2018. Year refers to the terminal year in the three point moving average. The open circles are the yearly swept area SSB estimates, the blue triangles are the 3-year moving average of the swept area estimates, and the **closed blue circles are the stochastic SSB estimates**. The green triangles are the stochastic estimates not including 2017 and not adjusted with a Kalman filter, and the red diamond (no 2017) and square (with 2017) are the stochastic estimates adjusted with a Kalman filter (not used in last update).<sup>2</sup>

## **Management System and Fishery Performance**

### *Management*

The Council established management of spiny dogfish in 2000 and the management unit includes all federal East Coast waters.

Access to the fishery is not limited, but a federal permit must be obtained to fish in federal waters and there are various permit conditions (e.g. trip limit and reporting). There is a federal trip limit of 6,000 pounds. Some states mirror the federal trip limit, but states can set their own trip limits. The annual quota has been allocated to state shares through the Atlantic States Marine Fisheries Commission (<http://www.asmfc.org/species/spiny-dogfish>).

Spiny Dogfish three-year specifications were adopted by the Council in October 2018 for May 1, 2019 through April 30, 2022 (the 2019-2021 fishing years). Quotas were adjusted to the current 29.6 million pounds for the 2021 fishing year after an adjustment to the Council's risk policy and are planned to remain there since a 2022 research track assessment should be able to project catches for specifications starting with the 2023 fishing year.

Recreational landings are a minimal component of fishing mortality, and dead recreational discards comprise a relatively low portion of discard mortality.

### *Commercial Fishery*

Figure 2 and Table 1 illustrate spiny dogfish landings for the 2000-2020 fishing years relative to the quotas in those years. Additional years' landings are available in the 2019 NMFS Science Center data update. The Advisory Panel has previously noted that the fishery is subject to strong market constraints given weak demand.

Figure 3 provides inflation-adjusted spiny dogfish ex-vessel prices in "real" 2019 dollars.

Figure 4 illustrates preliminary landings from the 2021 and 2020 fishing years relative to the current quota. The last 2021/blue data point is typically the most incomplete.

Tables 2-4 provide information on landings in the 2018-2020 fishing years by state, month, and gear type.

Table 5 provides information on the numbers of participating vessels that have at least one federal permit. State-only vessels are not included, but the table should still illustrate trends in participation.

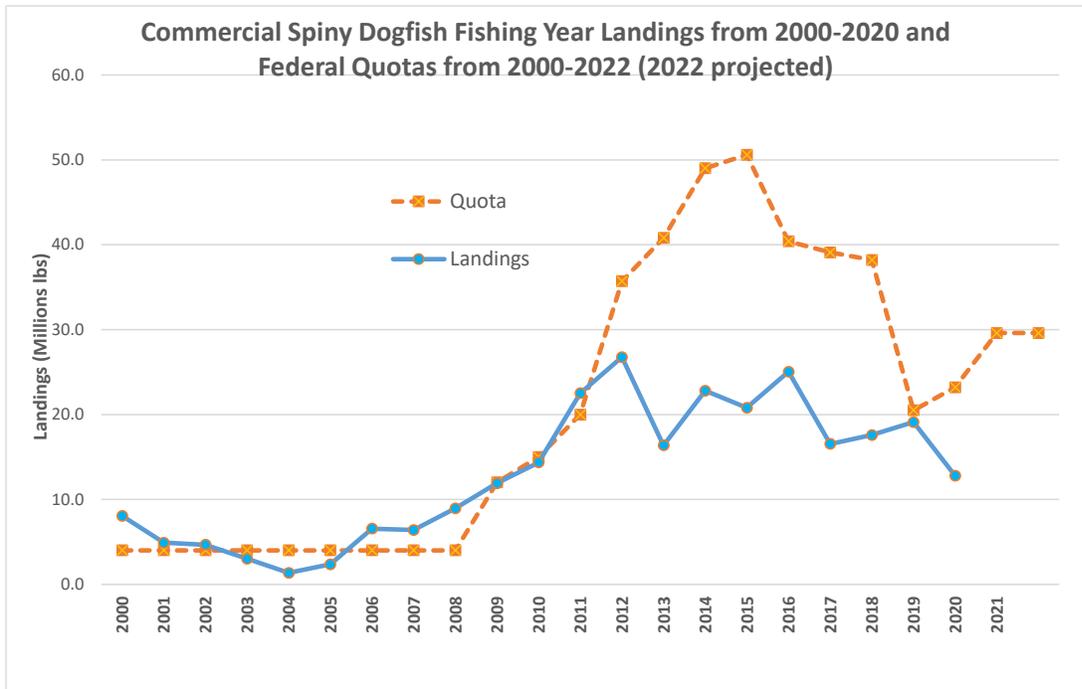


Figure 2. Annual spiny dogfish landings and federal quotas since 2000. <sup>4</sup>

Table 1. Commercial spiny dogfish fishing year landings from 2000-2020 and federal quotas from 2000-2022 (2022 Proposed)<sup>4</sup>

Fishing year	Fed Quota (M lb)	Landings (M lb)
2000	4.0	8.1
2001	4.0	4.9
2002	4.0	4.7
2003	4.0	3.0
2004	4.0	1.3
2005	4.0	2.3
2006	4.0	6.6
2007	4.0	6.4
2008	4.0	8.9
2009	12.0	11.9
2010	15.0	14.4
2011	20.0	22.5
2012	35.7	26.8
2013	40.8	16.4
2014	49.0	22.8
2015	50.6	20.8
2016	40.4	25.0
2017	39.1	16.5
2018	38.2	17.6
2019	20.5	19.1
2020	23.2	12.8
2021	29.6	
2022	29.6	

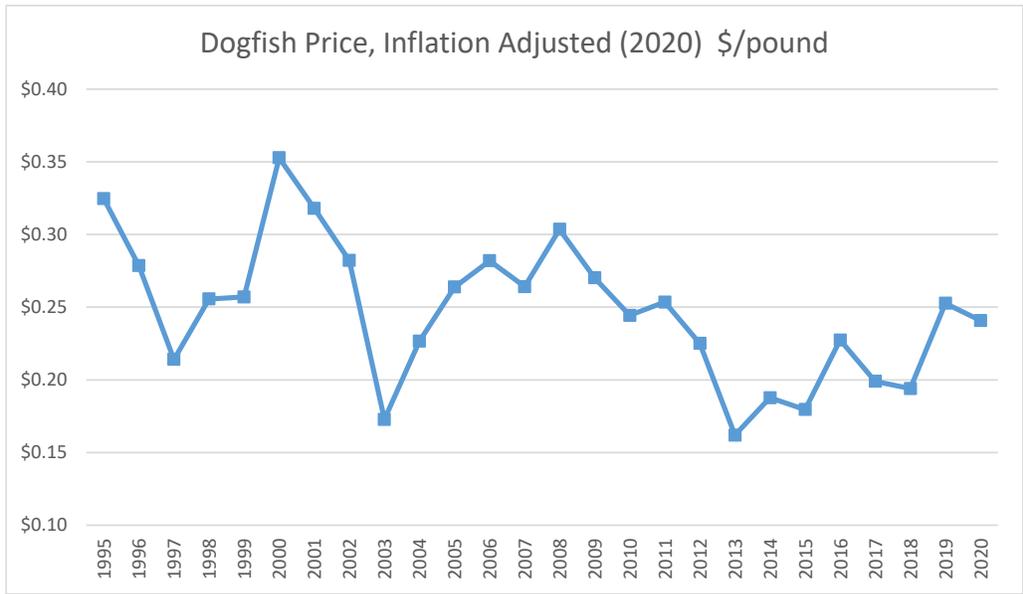


Figure 3. Price of spiny dogfish (\$/live pound) (adjusted to 2020 “real” dollars using the GDP deflator, 1995-2020 fishing years. Given the difference between fishing year and the calendar year used for inflation adjusting, adjusted prices are approximate. Source: NMFS unpublished dealer data. <sup>4</sup>

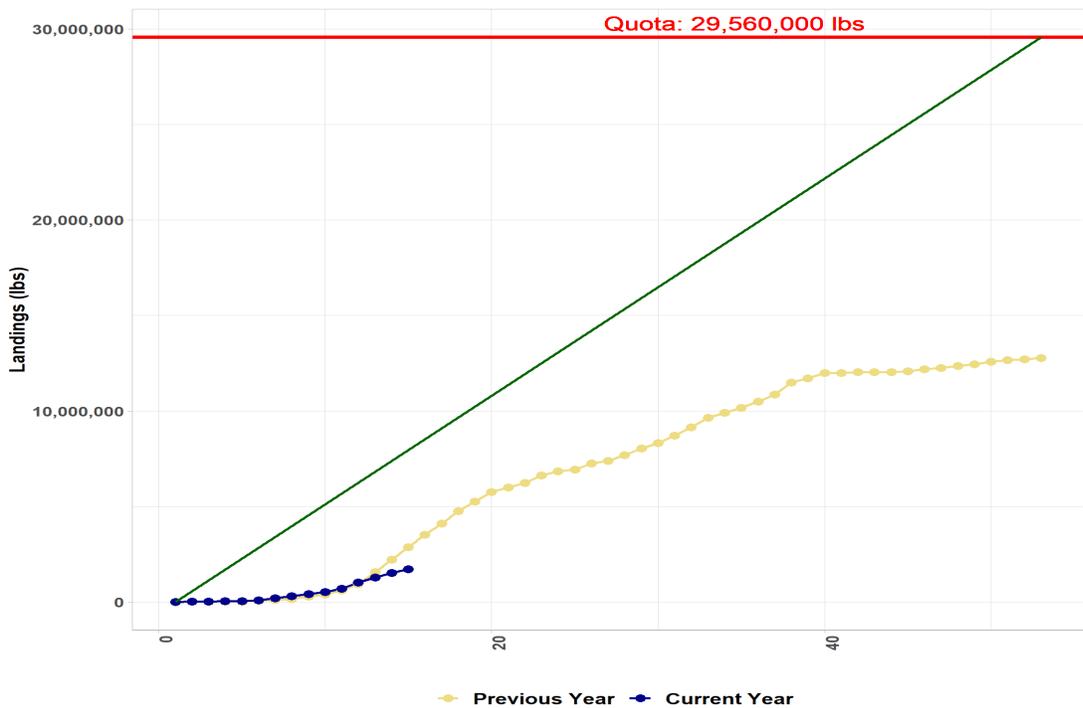


Figure 4. Preliminary Spiny dogfish landings; the 2021 fishing year (Starts May 1) is in blue through August 11, 2021, and the 2020 fishing year is in yellow-orange. Source: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region> . <sup>4</sup>

Table 2. Commercial Spiny Dogfish landings (live weight – millions of pounds) by state for 2018-2020 fishing years. Source: NMFS unpublished dealer data. <sup>4</sup>

fishyear	MA	VA	NJ	Other (NC,NH, MD, RI,CT, NY)	Total
2018	7.7	5.6	1.3	3.0	17.6
2019	6.6	7.4	1.9	3.1	19.1
2020	6.6	2.9	1.9	1.4	12.8

Table 3. Commercial Spiny Dogfish landings (live weight – millions of pounds) by month for 2018-2020 fishing years. Source: NMFS unpublished dealer data. <sup>4</sup>

fishyear	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
2018	0.0	0.1	2.3	2.7	1.8	1.5	1.3	2.5	1.6	1.8	1.2	0.8	17.6
2019	0.1	0.2	2.3	2.7	1.6	1.0	1.6	2.6	2.3	1.9	2.4	0.4	19.1
2020	0.0	0.3	1.8	2.8	1.5	0.9	1.4	1.6	1.6	0.0	0.4	0.3	12.8

Table 4. Commercial Spiny Dogfish landings (live weight – millions of pounds) by gear for 2018-2020 fishing years. Source: NMFS unpublished dealer data. <sup>4</sup>

fishyear	GILL_NET_SINK_OTHER	UNKNOWN	LONGLINE_BOTTOM	GILL_NET_SETS_TAKE_SEA_BASS	HAND_LINE_OTHER	TRAWL_OTTER_BOTTOM_FISH	Other	Total
2018	10.2	2.9	0.5	1.3	1.8	0.4	0.4	17.6
2019	12.1	3.0	1.3	1.5	0.5	0.5	0.3	19.1
2020	9.0	1.2	2.0	0.1	0.0	0.4	0.0	12.8

Table 5. Participation by fishing year of federally-permitted vessels. State-only vessels are not included. <sup>4</sup>

<b>YEAR</b>	<b>Vessels 200,000+</b>	<b>Vessels 100,000 - 199,999</b>	<b>Vessels 50,000 - 99,999</b>	<b>Vessels 10,000 - 49,999</b>	<b>Total with at least 10,000 pounds landings</b>
2000	16	10	8	43	77
2001	4	12	10	33	59
2002	2	14	8	31	55
2003	4	5	3	17	29
2004	0	0	0	42	42
2005	0	0	1	67	68
2006	0	4	11	114	129
2007	1	2	21	72	96
2008	0	5	20	119	144
2009	0	11	42	166	219
2010	0	26	54	124	204
2011	1	48	73	135	257
2012	25	55	56	146	282
2013	10	27	45	87	169
2014	27	38	38	81	184
2015	31	33	36	59	159
2016	52	26	14	45	137
2017	28	27	24	32	111
2018	28	26	20	35	109
2019	29	25	21	29	104
2020	23	27	15	22	87

Staff received a request about participation in May-August 11, 2021 (i.e. most recent year to date). While very preliminary, no federally-permitted vessels had yet landed over 200,000 pounds and only 22 had landed over 10,000 pounds.

## **Trip Limits and Prices**

To consider the potential effect of federal trip limit changes on spiny dogfish ex-vessel prices, staff examined the most recent two federal trip limit changes, which occurred on September 8, 2014 (4,000 pounds to 5,000 pounds and August 15, 2016 (5,000 pounds to 6,000 pounds). The May 1, 2013 trip limit change (3,000 pounds to 4,000 pounds) occurred during a time of the year when weekly landings are low, making analysis across the trip limit change date problematic. Trip limit changes further back in time may be less reflective of current conditions.

Staff first noted that looking at annual prices (Figure 3), there did not seem to be negative changes in the relevant fishing years. The changes took place about one-third into the fishing year (begins May 1) so were in effect for about two-thirds of each respective fishing year. Compared to the prior year, annual average price increased in both 2014 (vs 2013) and 2016 (vs 2015). While average price fell in each subsequent year (the first full year after the trip limit change), the subsequent full year's average price was still above the prior full year's average price in both instances (i.e. 2015 vs 2013 and 2017 vs 2015).

Staff then reviewed landings data from the four weeks preceding and following the two respective trip limit changes. In both instances, vessels began using the higher trip limit after the change, but not all trips landed at or near the trip limit. In neither case did there appear to be a negative effect on prices. Staff examined these relatively small time periods in an effort to isolate the effect of the trip limit change from other potential external effects on supply and demand that could affect prices paid to vessels.

In 2014, in the four weeks before the change (September 8, 2014), 2.6 million pounds of spiny dogfish were landed at an average price of \$0.21. In the four weeks after the change, 2.2 million pounds were landed at an average price of \$0.22.

In 2016, in the four weeks before the change (August 15, 2016), 4.2 million pounds of spiny dogfish were landed at an average price of \$0.23. In the four weeks after the change, 3.8 million pounds were landed at an average price of \$0.25.

Staff also reviewed 2018-2020 data for trips over 10,000 pounds, which all occurred in North Carolina. Prices for these trips (about 120 and averaging 12,800 pounds) averaged \$0.12 per pound, well below the average prices in those years. However differences in shipping costs make it difficult to determine if trip size is a factor in the differences in ex-vessel prices. By comparison, landings from those years between 5,000 pounds and 6,000 pounds averaged \$0.17 per pound in Virginia and \$0.22 per pound in Massachusetts.

In general, a review of fishery performance bridging the last two trip limit increases does not raise concern to staff that a relatively small, incremental trip limit change would substantially affect ex-vessel prices. However, data are not available to examine larger changes and any proposal for a large increase in trip limits should be considered cautiously.

## References

<sup>1</sup> Stehlik, Linda. 2007. Essential Fish Habitat source document: Spiny Dogfish, *Squalus acanthias*, Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-203; 52 p.

<sup>2</sup> NEFSC 2018. Spiny Dogfish Assessment Update. Available at <http://www.mafmc.org/ssc-meetings/2018/sept-11>.

<sup>3</sup> NEFSC 2019. Spiny Dogfish Data Update. Available at <http://www.mafmc.org/ssc-meetings/2019/september-9-11>.

<sup>4</sup> Unpublished NMFS dealer and/or Vessel Trip Report data.