

Table 1. Landings, discards and catches (mt) of *Doryteuthis pealeii* in NAFO Subareas 5+6, during 1963-2022, and TACs (mt) during 1974-2023.

Year	Landings (mt)			Discards (mt)	Catch (mt)	TAC (mt)	% of TAC Landed
	USA	Distant Water Fleets	Total				
1963	1,294	0	1,294	44	1,338		
1964	576	2	578	20	598		
1965	709	99	808	27	835		
1966	722	226	948	32	980		
1967	547	1,130	1,677	57	1,734		
1968	1,084	2,327	3,411	116	3,527		
1969	899	8,643	9,542	324	9,866		
1970	653	16,732	17,385	591	17,976		
1971	727	17,442	18,169	618	18,787		
1972	725	29,009	29,734	1,011	30,745		
1973	1,105	36,508	37,613	1,279	38,892		
1974	2,274	32,576	34,850	1,185	36,035	71,000	
1975	1,621	32,180	33,801	1,149	34,950	71,000	
1976	3,602	21,682	25,284	860	26,144	44,000	57
1977	1,088	15,586	16,674	567	17,241	44,000	38
1978	1,476	9,355	10,831	368	11,199	44,000	25
1979	4,252	13,068	17,320	589	17,909	44,000	39
1980	3,996	19,750	23,746	807	24,553	44,000	54
1981	2,316	20,212	22,528	766	23,294	44,000	51
1982	2,848	15,805	18,653	634	19,287	44,000	42
1983	10,867	11,720	22,587	768	23,355	44,000	51
1984	7,689	11,031	18,720	636	19,356	44,000	43
1985	6,899	6,549	13,448	457	13,905	44,000	31
1986	11,525	4,598	16,123	548	16,671	44,000	37
1987	10,367	2	10,369	353	10,722	44,000	24
1988	18,593	3	18,596	632	19,228	44,000	42
1989	23,733	5	23,738	634	24,372	44,000	54
1990	15,399	0	15,399	589	15,988	44,000	35
1991	20,299	0	20,299	290	20,589	44,000	46
1992	19,018	0	19,018	577	19,595	44,000	43
1993	23,020	0	23,020	930	23,950	44,000	52
1994	23,480	0	23,480	425	23,905	44,000	53
1995	18,880	0	18,880	791	19,671	36,000	52
1996	12,503	0	12,503	301	12,804	25,000	50
1997	16,270	0	16,270	374	16,644	21,000	77
1998	19,145	0	19,145	109	19,255	21,000	91
1999	19,173	0	19,173	1,323	20,496	21,000	91
2000	17,535	0	17,535	110	17,645	15,000	117
2001	14,345	0	14,345	408	14,753	17,000	84
2002	16,868	0	16,868	261	17,129	17,000	99
2003	11,941	0	11,941	146	12,087	17,000	70
2004	15,738	0	15,738	224	15,962	17,000	93

Table 1 (cont.)

Year	Landings (mt)			Discards (mt)	Catch (mt)	TAC (mt)	% TAC Landed
	USA	Distant Water Fleets	Total				
2005	16,720	0	16,720	560	17,280	17,000	98
2006	15,920	0	15,920	285	16,205	17,000	94
2007	12,343	0	12,343	87	12,430	17,000	73
2008	11,394	0	11,394	68	11,462	17,000	67
2009	9,307	0	9,307	135	9,442	19,000	49
2010	6,748	0	6,748	69	6,817	18,667	36
2011	9,556	0	9,556	221	9,777	19,906	48
2012	12,820	0	12,820	368	13,187	22,220	58
2013	11,090	0	11,090	246	11,336	22,049	50
2014	12,070	0	12,070	208	12,278	22,049	55
2015	11,953	0	11,953	97	12,050	22,445	53
2016	18,182	0	18,182	498	18,680	22,445	81
2017	8,188	0	8,188	131	8,319	22,445	36
2018	11,632	0	11,632	134	11,766	22,932	51
2019	12,458	0	12,458	315	12,773	22,932	54
2020	9,449	0	9,449	586	10,035	22,932	41
2021	10,759	0	10,759	580	11,339	22,932	47
2022	18,489	0	18,489	447	18,936	22,932	81
2023						22,932	
Averages							
1963-1986	2,896	13,593	16,489	561	17,049		
1987-2021	14,768	0.3	14,769	373	15,142	26,089	62
2007-2021	11,197	0	11,197	249	11,446	20,853	53
1963-2021	9,939	5,529	15,468	449	15,918	32,192	57

¹ Landings during 1963-1979 were obtained from Lange and Sissenwine (1983).

² Landings during 1979-2019 were obtained from the NEFSC Commercial Fisheries Database.

³ Domestic landings during 1982-1991 include Joint-Venture landings.

⁴ Domestic landings include unclassified squid which were pro-rated by month and 2-digit Statistical Area (1982-1995) or additive (1996-2019)

⁵ Since May of 2004, landings have been reported electronically by dealers.

⁶ Discards during 1963-1988 were hindcast as 3.4% of the landings based on the 1989-2009 average of the sums of the discards / total landings.

⁷ TACs during 1974-1975 were established by ICNAF (now NAFO) for both *Illex illecebrosus* and *Doryteuthis pealeii* combined. The 44,000 mt TAC in effect during 1976-1994 does not apply to the stock because it was based on the incorrect assumption that this sub-annual species lives for two years.

Table 2. *Doryteuthis pealeii* fishery closures that occurred during 2000-2022 when in-season quotas were in effect. Quotas were trimester-based during 2000 and 2007-2022 and quarterly during 2001-2006. Since 2010, rollovers of Trimester I quota underages, to Trimesters II and III have been allowed. Fishery closures during 2000-2021 triggered a regulatory trip limit of 1,134 kg of *D. pealeii*. As of April 4, 2014, the Trimester II fishery closure trip limit is 113 kg.

Year	Quota period I	Quota period II	Quota period III	Quota period IV
2000	Mar 25 – Apr 30	Jul 1- Aug 31		Sep 7 – Oct 6, Oct 26 - Dec 31
2001		May 29 – Jun 30		
2002		May 28 – Jun 30	Aug 16 – Sep 30	Nov 2 - Dec 11, Dec 24 – Dec 31
2003	Mar 25 - Mar 31			
2004	Mar 5 - Mar 31			
2005	Feb 20 - Mar 31	Apr 25 - Jun 30		Dec 18 - Dec 31
2006	Feb 13 - Mar 31	Apr 21 - Apr 27, May 23 - Jun 30	Sep 2 - Sep 30	
2007	Apr 13 - Apr 30			
2008		July 17 - Aug 31		
2009		Aug 6 - Aug 31		
2010				
2011		Aug 23-Aug 31		
2012	*Apr 17-Apr 30	July 10 - Aug 31		
2013				
2014		Aug 11-Aug 31		
2015				
2016		June 27-Aug 31		
2017				
2018				
2019				
2020				
2021				
2022		Aug 5 - Aug 31		

* *D. pealeii* fishery closure due to harvesting the incidental catch cap for Atlantic butterfish (*Peprilus triacanthus*).

Table 3. Data sources, estimators and estimates of longfin squid commercial discards and their precision during 2019-2022. With the exception of 2019, the discard estimates included in the rows that are shaded grey were not included in the assessment. OBDBS represents the Northeast Fisheries Observer Program and CAMS represents the Catch Monitoring System Database.

Year	Landings data source for estimating K_all (kept weight of all species)	Data source for estimating d/k ratio	Bottom trawl fleet codend mesh size categories (in.)	Discard estimator	Time step ¹	Discards (mt), 90% CL	CV
2019	cfkets2019aa	OBDBS via SAS dataset	sm (≤ 2.49), med (2.50-5.49) and lg (≥ 5.50)	combined ratio	CY by trimester	315 (147, 483)	0.32
	CAMS	CAMS	sm (< 4.00) and lg (≥ 4.00)	"separate ratio" (cumulative)	FY by 12-month period	357	0.18
2020	CAMS	OBDBS in STOCKEFF	sm (≤ 2.49), med (2.50-5.49) and lg (≥ 5.50)	combined ratio	CY by trimester	543 (218, 868)	0.36
	CAMS	CAMS	sm (< 4.00) and lg (≥ 4.00)	"separate ratio" (cumulative)	FY by 12-month period	586	0.28
2021	CAMS	OBDBS in STOCKEFF	sm (≤ 2.49), med (2.50-5.49) and lg (≥ 5.50)	combined ratio	CY by trimester	250 (97, 403)	0.37
	CAMS	CAMS	sm (< 4.00) and lg (≥ 4.00)	"separate ratio" (cumulative)	FY by 12-month period	580	0.32
2022	CAMS	CAMS	sm (< 4.00) and lg (≥ 4.00)	"separate ratio" (cumulative)	FY by 12-month period	447	0.19

¹ For longfin squid, fishing year (FY) and calendar year (CY) are the same.

Table 4. Percentages of *Doryteuthis pealeii* discards estimated with data from the Catch Monitoring System Database, by discard estimation source, during 2020-2022.

Year	Stock-gear group rate (< 5 trips in season and previous season in full stratification)	Stock-gear-mesh group rate (< 5 trips in season and previous season in full stratification)	In-season rate (≥ 5 trips in full stratification)	Observed trips (discard rate not used)	Transition in-season rate (< 5 trips in full stratification in yr t and ≥ 5 trips in yr t-1)
2020	0.8%	0.0%	97.4%	1.2%	0.5%
2021	1.0%	0.2%	94.2%	4.6%	0.0%
2022	3.7%	0.5%	87.1%	8.4%	0.3%

Table 5. Estimates of *Doryteuthis pealeii* total discards (mt) and their precision during 1989-2022. Discards estimated for 1989-2019 used a different estimator and data from a different database than those used to estimate the 2020-2022 discards. During the trimester-based quota period (2000, 2007-2022), trip limits were triggered during some years because harvesting of the trimester quotas caused fishery closures.

Year	Total Discards	
	(mt)	CV
1989	634	0.23
1990	589	0.46
1991	290	0.62
1992	577	0.56
1993	930	0.14
1994	425	0.66
1995	791	0.28
1996	301	0.81
1997	374	0.45
1998	109	0.72
1999	1,323	0.50
2000	110	1.52
2001	408	0.32
2002	261	0.65
2003	146	0.39
2004	224	0.30
2005	560	0.25
2006	285	0.70
2007	87	0.49
2008	68	0.63
2009	135	0.64
2010	69	0.92
2011	221	0.22
2012	368	0.32
2013	246	0.26
2014	208	0.42
2015	97	0.27
2016	498	0.28
2017	131	0.17
2018	134	0.19
2019	315	0.32
2020	586	0.28
2021	580	0.32
2022	447	0.19
Averages		
1989-2021	366	0.46
2007-2021	249	0.38

Table 6. Biomass estimates (q -adjusted swept-area in mt) of *Doryteuthis pealeii* for inshore strata (≤ 18 m) that are no longer sampled during NEFSC surveys as of 2009, based on data from the fall inshore NEAMAP surveys conducted during 2009-2022. Relative biomass indices (stratified mean kg per tow) and their associated CVs were provided by staff from the Virginia Institute of Marine Science.

Year	Biomass (mt)	CV
2009	12,861	0.11
2010	3,614	0.09
2011	3,656	0.10
2012	4,219	0.15
2013	7,324	0.10
2014	10,654	0.08
2015	6,647	0.06
2016	5,065	0.08
2017	3,796	0.08
2018	6,654	0.08
2019	4,137	0.17
2020	5,914	0.12
2021	7,414	0.10
2022	5,837	0.07
Average 2009-2022	6,271	0.10

Table 7. *Doryteuthis pealeii* biomass estimates (000s mt) for the two intra-annual cohorts caught in the NEFSC spring and fall surveys during 1976-2022. The US directed fishery occurred during 1987-2022. The 1987-2021 median biomasses are the cohort-specific BMSY proxies that were compared to the 2022 two-year moving average biomass of each survey cohort to determine stock status.

Year	NEFSC spring survey biomass (000s mt)	.Two-year moving avg. of spring survey biomass (000s mt)	NEFSC+NEAMAP fall surveys (000s mt)	Two-year moving avg. of fall survey biomass (000s mt)
1976	81.734		204.483	
1977	10.842	46.288	124.730	164.607
1978	23.709	17.276	82.372	103.551
1979	34.657	29.183	89.006	85.689
1980	34.948	34.803	154.830	121.918
1981	21.293	28.121	135.505	145.168
1982	31.449	26.371	135.185	135.345
1983	23.719	27.584	257.470	196.327
1984	48.822	36.271	226.068	241.769
1985	31.270	40.046	212.810	219.439
1986	27.578	29.424	160.412	186.611
1987	22.304	24.941	30.304	95.358
1988	43.315	32.810	101.390	65.847
1989	52.510	47.913	233.315	167.353
1990	29.904	41.207	112.536	172.926
1991	46.615	38.259	125.268	118.902
1992	39.402	43.008	113.255	119.262
1993	17.875	28.638	52.983	83.119
1994	8.116	12.996	298.443	175.713
1995	23.652	15.884	62.885	180.664
1996	10.133	16.892	41.480	52.183
1997	29.379	19.756	112.203	76.842
1998	10.229	19.804	57.658	84.931
1999	44.192	27.211	167.873	112.765
2000	21.639	32.916	330.148	249.010
2001	26.917	24.278	92.460	211.304
2002	54.622	40.769	253.946	173.203
2003	9.393	32.008	151.733	202.839
2004	8.976	9.184	93.264	122.498
2005	19.843	14.409	107.945	100.604
2006	34.397	27.120	249.422	178.684
2007	40.325	37.361	109.552	179.487
2008	15.486	27.905	122.699	116.126
2009	10.658	13.072	78.952	100.825
2010	8.329	9.439	165.956	122.454
2011	15.069	11.699	76.579	121.267
2012	81.612	48.341	241.191	158.885
2013	5.858	43.735	145.529	194.860
2014	- ¹		145.293	146.911
2015	15.208		111.461	128.377
2016	58.952	37.080	119.331	115.396
2017	21.488	40.220	- ¹	
2018	22.058	21.773	83.997	
2019	43.341	32.694	113.169	98.583
2020	- ¹		- ¹	
2021	37.378		231.936	
2022	55.295	46.336	162.734	197.335
Medians				
1987-2021	22.304	27.905	113.169	128.377
1976-2021	25.318	28.638	123.715	122.454

¹ Biomass estimates were not computed for the NEFSC 2014 and 2020 spring and 2017 fall surveys because of inadequate sampling coverage of the species' habitat. The 2020 fall survey was not conducted due to the COVID-19 pandemic.

Table 8. *Doryteuthis pealeii* exploitation indices for the Jan-June fishery on the intra-annual cohort caught in NEFSC spring surveys (Jan-June catch/spring survey biomass) and for the July-Dec fishery on the cohort caught in the NEFSC fall surveys (July-Dec catch/fall survey biomass) during 1987-2022. Biomass estimates are q-adjusted swept-area estimates.

Year	NEFSC spring survey biomass (000s mt)	Jan-June catches (000s mt)	Jan-June fishery exploitation indices (catch/biomass)	NEFSC fall survey biomass (000s mt)	July-Dec catches (000s mt)	July-Dec fishery exploitation index (catch/biomass)
1976	81.734			204.483		
1977	10.842			124.730		
1978	23.709			82.372		
1979	34.657			89.006		
1980	34.948			154.830		
1981	21.293			135.505		
1982	31.449			135.185		
1983	23.719			257.470		
1984	48.822			226.068		
1985	31.270			212.810		
1986	27.578			160.412		
1987	22.304	7.000	0.314	30.304	3.721	0.123
1988	43.315	11.368	0.262	101.390	7.860	0.078
1989	52.510	16.621	0.317	233.315	7.751	0.033
1990	29.904	8.505	0.284	112.536	7.483	0.066
1991	46.615	8.943	0.192	125.268	11.647	0.093
1992	39.402	10.598	0.269	113.255	8.997	0.079
1993	17.875	16.082	0.900	52.983	7.868	0.148
1994	8.116	7.132	0.879	298.443	16.773	0.056
1995	23.652	9.946	0.421	62.885	9.724	0.155
1996	10.133	10.261	1.013	41.480	2.543	0.061
1997	29.379	6.503	0.221	112.203	10.141	0.090
1998	10.229	12.875	1.259	57.658	6.379	0.111
1999	44.192	8.589	0.194	167.873	11.907	0.071
2000	21.639	10.008	0.463	330.148	7.637	0.023
2001	26.917	6.729	0.250	92.460	8.024	0.087
2002	54.622	8.573	0.157	253.946	8.556	0.034
2003	9.393	5.921	0.630	151.733	6.165	0.041
2004	8.976	9.279	1.034	93.264	6.683	0.072
2005	19.843	12.232	0.616	107.945	5.048	0.047
2006	34.397	9.214	0.268	249.422	6.991	0.028
2007	40.325	7.711	0.191	109.552	4.719	0.043
2008	15.486	5.812	0.375	122.699	5.650	0.046
2009	10.658	4.591	0.431	78.952	4.851	0.061
2010	8.329	2.766	0.332	165.956	4.051	0.024
2011	15.069	5.075	0.337	76.579	4.702	0.061
2012	81.612	7.328	0.090	241.191	5.859	0.027
2013	5.858	1.267	0.216	148.529	10.068	0.068
2014	- ¹	6.130		145.293	6.148	0.042
2015	15.208	4.169	0.274	111.461	7.881	0.071
2016	58.952	12.035	0.204	119.331	6.645	0.056
2017	21.488	4.002	0.186	- ¹	4.002	
2018	22.058	6.371	0.289	83.997	5.395	0.064
2019	43.331	8.146	0.188	113.169	4.626	0.041
2020	- ¹			- ¹		
2021	37.378	3.639	0.097	231.936	7.700	0.033
2022	55.295	7.736	0.140	162.734	11.200	0.069
Median 1987-2021	22.304	7.711	0.284	113.169	6.683	0.061

¹ NEFSC 2014 spring and 2017 fall surveys did not sample large portions of the species' habitat and the 2020 spring and fall surveys were impacted by the COVID-19 pandemic.

Table 9. Annualized biomass estimates (q-adjusted swept-area biomass, in 000s mt), during 1976-2022, and

exploitation indices during 1987-2022, for *Doryteuthis pealeii*. Annualized biomass estimates were not used to determine stock status, because they were rejected by the 2020 Level 3 Management Track Assessment review panel. The US directed fishery occurred during 1987-2022.

Year	Annualized biomass			Exploitation Indices	
	(Avg. of NEFSC fall and spring survey biomass, 000s mt)	Two-yr moving avg. of annualized B	Annual catch (000s mt)	Catch/annualized B	Catch/two-year moving avg. of annualized B
1976	143.108				
1977	67.786	105.447			
1978	53.041	60.413			
1979	61.832	57.436			
1980	94.889	78.360			
1981	78.399	86.644			
1982	83.317	80.858			
1983	140.594	111.956			
1984	137.445	139.020			
1985	122.040	129.743			
1986	93.995	108.018			
1987	26.304	60.150	10.722	0.408	0.178
1988	72.353	49.328	19.228	0.266	0.390
1989	142.912	107.633	24.372	0.171	0.226
1990	71.220	107.066	15.988	0.224	0.149
1991	85.942	78.581	20.589	0.240	0.262
1992	76.329	81.135	19.595	0.257	0.242
1993	35.429	55.879	23.950	0.676	0.429
1994	153.280	94.354	23.905	0.156	0.253
1995	43.269	98.274	19.671	0.455	0.200
1996	25.806	34.538	12.804	0.496	0.371
1997	70.791	48.299	16.644	0.235	0.345
1998	33.944	52.367	19.254	0.567	0.368
1999	106.032	69.988	20.496	0.193	0.293
2000	175.894	140.963	17.645	0.100	0.125
2001	59.688	117.791	14.753	0.247	0.125
2002	154.284	106.986	17.129	0.111	0.160
2003	80.563	117.423	12.087	0.150	0.103
2004	51.120	65.841	15.962	0.312	0.242
2005	63.894	57.507	17.280	0.270	0.300
2006	141.909	102.902	16.205	0.114	0.157
2007	74.939	108.424	12.430	0.166	0.115
2008	69.092	72.015	11.462	0.166	0.159
2009	48.805	56.949	9.442	0.211	0.166
2010	87.142	65.974	6.817	0.078	0.103
2011	45.824	66.483	9.777	0.213	0.147
2012	161.401	103.613	13.187	0.082	0.127
2013	77.194	119.297	11.336	0.147	0.095
2014	- ¹		12.278		
2015	63.334		12.050	0.190	
2016	89.142	76.238	18.680	0.210	0.245
2017	- ¹		8.319		
2018	53.028		11.766	0.222	
2019	78.250	63.639	12.772	0.163	0.195
2020			10.035		
2021	134.657		11,339	0.084	
2022	109.015	121.836	18.936	0.174	0.155
Median 1987-2021	73.646	76.238	14.753	0.211	0.195

¹ Biomass estimates were not computed for the NEFSC 2014 spring and 2017 fall surveys because large portions of the species' habitat were not sampled due to survey vessel mechanical problems.

Table 10. Biomass Reference Point proxies for *Doryteuthis pealeii* intra-annual cohorts caught in the NEFSC spring and fall (NEFSC fall + NEAMAP fall survey biomass for 2009 onward) surveys and the terminal-year 2019 and 2022 biomass estimates (two-year moving averages of *q*-adjusted swept area biomass) used to determine the stock statuses for each cohort. There are no fishing mortality Reference Points for this stock, so the overfishing status is unknown. The cohort-based biomasses and Reference Point proxies were used for stock status determination because cohort-specific biomass Reference Points were recommended by the 2020 Level 3 Management Track Assessment review panel, which rejected the annualized biomass Reference Point proxies.

Biomass Reference Point Proxies (mt)		Biomass (mt) (80% CI)		Overfished Stock Status in 2022
		2022 (2023 assessment)	2019 (2020 assessment)	
Spring survey cohort ¹ Target B	22,304			
Threshold B	11,152	46,336 (42,545, 50,128)	32,092 (27,608, 36,576)	Not Overfished
Fall survey cohort ¹ Target B	112,536			
Threshold B	56,268	197,335 (167,403, 227,268)	94,606 (87,126, 102,085)	Not Overfished
Annualized ² Target B	42,405			
Threshold B	21,203	121,836 (106,748, 136,923)	63,349 (58,989-67,709)	Not Overfished

¹ Cohort-based biomass Reference Point proxies were computed as the 1987-2021 median biomasses for each of the two cohorts caught in the NEFSC spring and fall bottom trawl surveys. ² The annualized BMSY proxies were computed in 2010 by the SAW/SARC 51 Working Group (SAW/SARC 51; NEFSC 2011a; 2011b).