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An Update to Commercial Catch and Survey Indices for Short-finned Squid (*Illex illecebrosus*) in the Northwest Atlantic for 1999

by

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Abstract

Annual catches in all SA 3-6 fishery areas declined in 1999 from 1998 levels. Survey indices of abundance and biomass from the SA 4 September survey and the SA 5+6 autumn survey also declined in 1999. Only the July SA 4 survey indices increased in 1999 but they still remained at a generally low level. Catches and survey indices in general suggest that total population abundance was lower in 1999 than in the previous year. Biomass has generally remained low for most year since 1982.

Introduction

This paper provides an update of the fishery for short-finned squid inshore at Newfoundland (NAFO Subarea 3) on the Nova Scotian Shelf (NAFO Subarea 4) and on the Northeast USA continental shelf (NAFO Subarea 5 and Statistical Area 6) for 1999. Catches in all areas are compared to long-term trends and to survey-based abundance and biomass indices, toward inferring annual changes in abundance levels. Subarea 3 catches have been described for most years between 1965 and 1998 (Mercer MS 1975; Collins and Ennis MS 1978; Hurley et al. MS 1979; Beck et al. MS 1980, MS 1981, MS 1982, MS 1983, MS 1986, MS 1989; MS 1994; MS 1998; Drew et al. MS 1984, MS 1985; Dawe et al. MS 1999). Catches and survey indices have been reviewed recently for all areas (Dawe and Hendrickson MS 1998; Hendrickson 1999; NAFO 1999).

Materials and Methods

Squid catches for Subarea 3 are predominately derived from a directed small-boat jig fishery, which is prosecuted in shallow near-shore areas of insular Newfoundland. Subarea 4 catches are from the international bottom trawl fishery for silver hake, squid and argentine on the Scotian Shelf. Catches from Subarea 5 and Statistical Area 6 are from a directed bottom trawl fishery prosecuted between the mid-Atlantic Bight and the Gulf of Maine. This has become a predominately domestic fishery in recent years (Dawe and Hendrickson 1998).

Indices of abundance (no/tow) and biomass (kg/tow) from Subareas 4 are available from two bottom trawl surveys, one conducted in July since 1970 on the Scotian Shelf (Div. 4VWX) and another in September, since 1971 (Koeller 1980).in the southern Gulf of St. Lawrence (Div. 4T).A bottom trawl survey has also been conducted annually in autumn since 1967 in SA 5+6.

Results and Discussion

Reported Catches

The total catch for the entire Northwest Atlantic decreased from about 25,500 t in 1998 to 7,700 t in 1999 (Table 1, Fig. 2). This substantial decrease was due to decreases in all fishery areas; from 815 t to 19 t in SA 3, from 1,119 t to 294 t in SA 4, and from 23,597 t to 7,388 t in SA 5+6. The SA 3+4 total catch has declined over the past 2 years from 15,780 t in 1997 to only 313 t in 1999, the lowest catch level since 1986.

Abundance and Biomass Indices

The two annual Subarea 4 bottom trawl surveys have different limitations with respect to providing reliable squid indices. The July survey on the Scotian Shelf (NAFO Div. 4VWX) is the more suitable with respect to survey area but its timing is early relative to the fishery peak. Conversely, the timing of the September survey in the Southern Gulf of St. Lawrence (Div. 4T) corresponds well with the overall peak in the SA 3+4 fishery, but it is not conducted within the main fishery area. The SA 5+6 autumn survey is late in relation to the peak in the fishery in that area.

The SA 4 July survey abundance and biomass indices respectively increased from 9.95 squid/tow and 0.94 kg/tow in 1998 to 16.7 squid/tow and 2.02 kg/tow in 1999. (Table 2, Fig.2). In contrast, the indices from the other 2 surveys, conducted later in the year, both decreased in 1999. The SA 4 September survey abundance and biomass indices respectively decreased from 0.96 squid/tow and 0.21 kg/tow in 1998 to 0.23 squid/tow and 0.05 kg/tow in 1999. The SA 5+6 autumn survey abundance and biomass indices respectively decreased from 14.6 squid/tow and 1.4 kg/tow in 1998 to 1.38 squid/tow and 0.19 kg/tow in 1999.

All area-specific catch estimates and survey indices, excepting those from the July SA 4 survey, suggest that total population abundance was lower in 1999 than in the previous year. For Subarea 3 and 4 biomass has remained low since 1983.

Acknowledgements

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Table 1. Annual landings and TAC's by fishery area

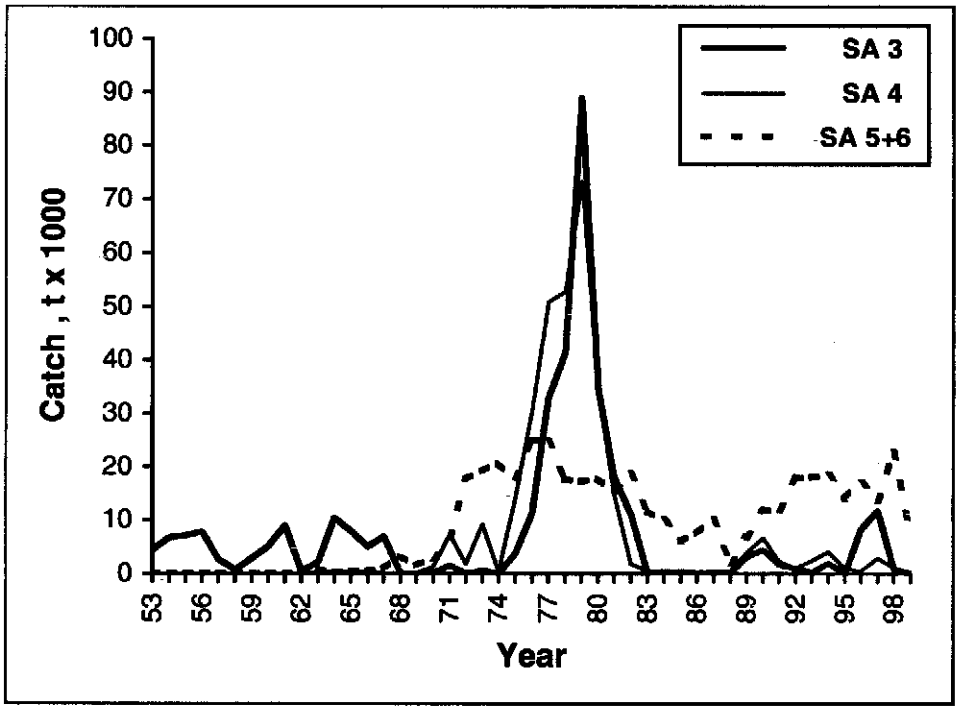
	Landings					TAC	
Year	SA 2+3	SA 4	2-4 Total	SA 5+6	Total	SA 2-4	SA 5+6
53	4460	51	4511	-	4511	-	-
54	6700	115	6815	-	6815	-	-
55	7019	269	7288	-	7288	-	-
56	7779	450	8229	-	8229	-	-
57	2634	335	2969	-	2969	-	-
58	718	84	802	-	802	-	-
59	2853	258	3111	-	3111	-	-
60	5067	24	5091	-	5091	-	-
61	8971	50	9021	-	9021	-	-
62	482	587	1069	-	1069	-	-
63	2119	103	2222	810	3032	-	-
64	10408	369	10777	360	11137	-	-
65	7831	433	8264	522	8786	-	-
66	5017	201	5218	570	5788	-	-
67	6907	126	7033	995	8028	-	-
68	9	47	56	3271	3327	-	-
69	21	65	86	1537	1623	-	-
70	111	1274	1385	2826	4211	-	-
71	1607	7299	8906	6614	15520	-	-
72	26	1842	1868	17641	19509	-	-
73	622	9255	9877	19155	29032	-	-
74	48	389	437	20628	21065	-	71000
75	3751	13945	17696	17926	35622	25000	71000
76	11257	30510	41767	24936	66703	25000	30000
77	32754	50726	83480	24795	108275	25000	35000
78	41376	52688	94064	17592	111656	100000	30000
79	88833	73259	162092	17241	179333	120000	30000
80	34780	34826	69606	17828	87434	150000	30000
81	18061	14801	32862	15571	48433	150000	30000
82	11164	1744	12908	18633	31541	150000	30000
83	5	421	426	11584	12010	150000	30000
84	397	318	715	9919	10634	150000	30000
85	404	269	673	6115	6788	150000	30000
86	1	110	111	7470	7581	150000	30000
87	194	372	566	10102	10668	150000	30000
88	272	528	800	1958	2758	150000	30000
89	3101	3899	7000	6802	13802	150000	30000
90	4440	6560	11000	11670	22670	150000	30000
91	1719	2277	3996	11908	15904	150000	30000
92	924	1076	2000	17827	19827	150000	30000
93	276	2398	2674	18012	20686	150000	30000
94	1954	4016	5970	18350	24320	150000	30000
95	48	984	1032	14058	15090	150000	30000
96	8285	445	8730	16969	25699	150000	21000
97	12748	3032	15780	13629	28150	150000	19000
98	815	1119	1934	23597	25531	150000	19000
99	19	294	313	7388	7701	75000	19000

TACs during 1974 and 1975 for SA 5+6 included Loligo pealei and Illex illecebrosus

In addition to SA 3+4 TACs in 1975-1977, countries without allocations were permitted 3,000 t each.

Table 2. Survey abundance and biomass indices.

	SA 5+6 Fall Survey		SA 4 July Survey		SA 4 Sept. Survey	
Year	no/tow	kg/tow	no/tow	kg/tow	no/tow	kg/tow
67	1.57	0.242				
68	1.64	0.307				
69	0.59	0.073				
70	2.26	0.268	5.6	0.4		
71	1.68	0.337	28.5	2.8	0.7198	0.1616
72	2.19	0.292	6.6	0.7	0.0459	0.0089
73	1.47	0.353	10.9	1.5	0.0791	0.022
74	2.82	0.392	13.4	1.8	0.0614	0
75	8.74	1.417	44.8	5	2.4733	0.507
76	20.55	7.018	231.2	42.7	30.7555	8.0412
77	12.62	3.740	50.9	9.5	25.7339	7.6088
78	19.25	4.529	16.4	2.3	55.9461	15.8674
79	19.42	6.053	91.4	14.2	28.4738	8.1428
80	13.81	3.285	23.3	2.2	18.0379	4.5802
81	27.10	9.340	35.5	4.9	5.7566	1.6734
82	3.94	0.602	26	2.1	0.3846	0.0754
83	1.73	0.233	76.9	2.1	0.0869	0
84	4.54	0.519	14.1	1.5	0.0274	0.0038
85	2.38	0.355	80.2	2.7	0.4753	0.107
86	2.10	0.257	7.7	0.4	0.0847	0.0075
87	15.83	1.527	4.9	0.4	0.1551	0.0191
88	23.22	2.997	47.3	2.7	1.326	0.4038
89	22.43	3.307	26.3	2.7	0.2987	0.0359
90	16.61	2.401	40.6	4.8	0.8786	0.1379
91	5.21	0.691	27.1	1.8	0.124	0.0292
92	8.24	0.804	121.7	7.3	0.2816	0.0469
93	10.42	1.595	79	5.4	0.5829	0.1008
94	6.83	0.860	45.3	4.2	0.256	0.1023
95	8.01	0.700	33.9	2.4	0.1571	0.0185
96	10.76	0.926	11.9	0.9	0.7041	0.1109
97	5.83	0.521	52	4.8	0.9575	0.1688
98	14.6	1.4	9.95	0.94	0.9591	0.2109
99	1.38	0.19	16.7	2.02	0.2342	0.0499



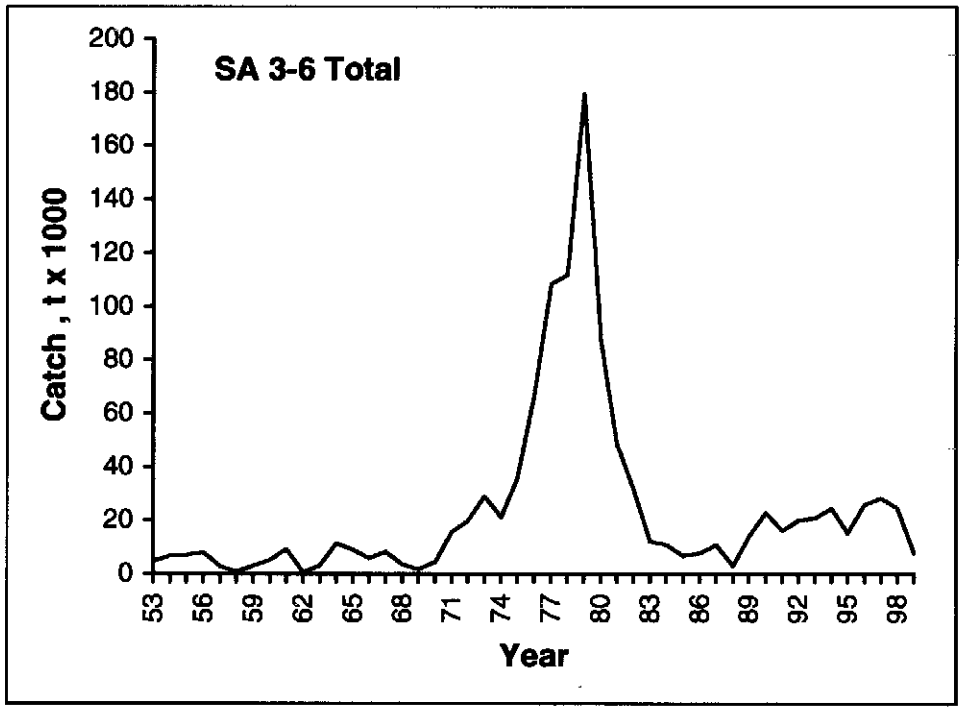


Fig. 1. Trends in annual catch by NAFO Subarea (top), and for the entire Northwest Atlantic (below), 1953-1999.

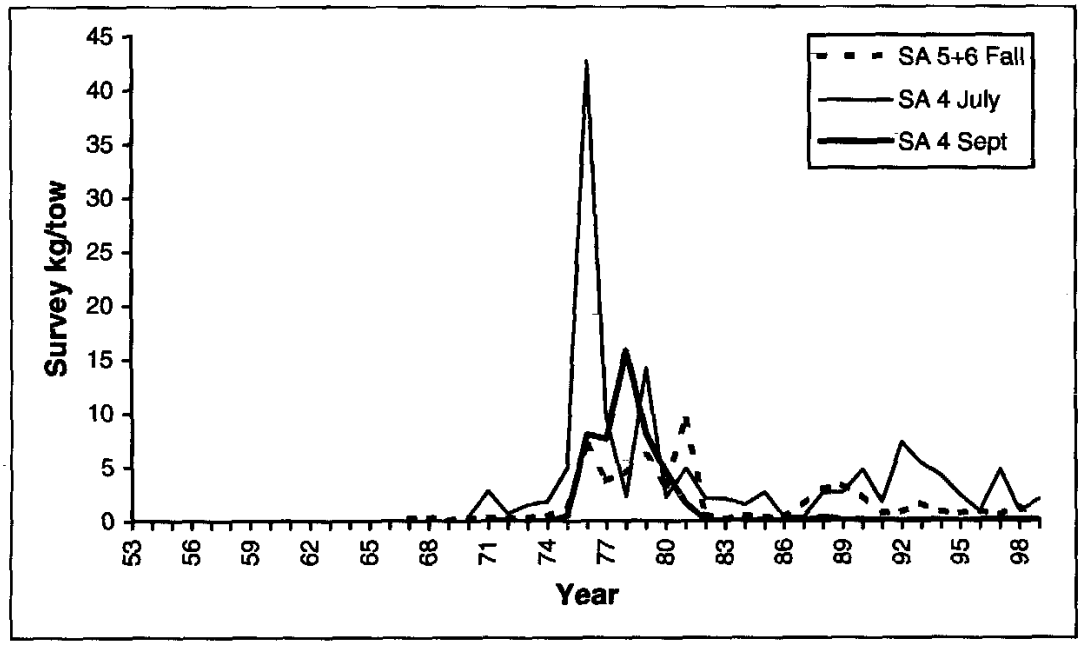


Fig.2.Trends in survey biomass indices by fishery area.