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Updated simulations of development in stock size and pup production for harp seals in the Greenland Sea 1946-1993, and corresponding catch and stock projections.

by

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Applying the same model as in Ulltang (1989a, b), the development in stock size and pup production of the Greenland Sea harp seal population is simulated for the period 1946-1993, assuming a pup production of 50000 in 1991 (minimum estimate adopted by the Working Group in 1991). A value of natural mortality M = 0.11 has been adopted, with natural mortality of age group 0 equal to 3M. Also the same maturity ogive (10% of 5 years old, 50% of 6 years old and 100% of 7 years old seals recruited to the breeding stock) and fertility rate (f=0.94) as used in earlier reports have been applied. Stock and catch predictions (Table 2) for 1994 are given for the same options as in earlier Working Group reports. For 1993, only Norwegian catches were known and included.

References

Ulltang, Ø. 1989a. Simulations of development in stock size and pup production for harp seals in the Greenland Sea ("West Ice") 1946-1989. Working paper SEA-16 to the meeting of the ICES Working Group on Harp and Hooded seals, Bergen October 1989.

Ulltang, Ø. 1989b. Stock projections for harp seals in the Greenland Sea 1990-1999. Working paper SEA-19 to the meeting of the ICES Working Group on Harp and Hooded seals, Bergen October 1989.

Table 1. Simulations of stock development of harp seals in the Greenland Sea 1946-1993, calibrated to a pup production of 50000 in 1991. M = 0.11.

Year	Pup production	Tot. stock size (1+)
1946	76843	393088
1947	79447	395485
1948	81477	383872
1949	74451	355272
1950	77700	346050
1951	77867	340194
1952	74719	320525
1953	72538	307386
1954	69762	301988
1955	67756	298819
1956	61324	285541
1957	57687	282621
1958	50489	275449
1959	47947	257229
1960	47323	236851
1961	47973	221658
1962	47033	212109
1963	48053	200641
1964	47118	201500
1965	43256	206025
1966	39158	192836
1967	37674	181585
1968	37902	174287
1969	38797	167851
1970	40739	173871
1971	41220	171729
1972	39979	175459
1973	38832	174995
1974	38413	176159
1975	39123	174821
1976	40357	180907
1977	39933	181115
1978	40563	178350
1979	40930	177075
1980	41278	176928
1981	41564	177005
1982	42891	176818
1983	43149	180090
1984	42794	186445
1985	42950	196057
1986	43958	206099
1987	45294	212765
1988	45666	211361
1989	46561	208830
1990	48337	216589
1991	50001	223146
1992	49823	229940
1993	49759	233281

Table 2. Catch and stock predictions for harp seals in the Greenland Sea.

M = 0.11 1994 N_o = 50 672 N_{1+} = 241 601

Exploitation rates of		Catches 1994			Catches Equilibrium		
Pups	1+	Pups	1+	Total	Pups	1+	Total
a) u_o = 0	u_{1+} = 0.046	0	11113	11113	0	11412	11412
b) u_o = 0.443	u_{1+} = 0	22448	0	22448	27278	0	27278
b) u_o = 0.225	u_{1+} = 0.025	11401	6040	17441	12382	6026	18408