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SEALS IN ICELANDIC WATERS

by

Sólmundur T. Einarsson
Marine Research Institute
Reykjavík, Iceland

In Icelandic waters only two species of pinnipeds breed, the common seal (Phoca vitulina vitulina) and the grey seal (Halichoerus grypus). In addition there are four other species occasionally seen around the north coast of Iceland, these are the ringed seal (Phusa hispidia), harp seal (Phoca groenlandicus or Phagophilus groenlandicus), hooded seal (Cystophora cristata) and bearded seal (Erignatus barbatus) (Sæmundsson 1932). The common seal breeds from early May to July with its maximum in May-June. On the south coast the breeding starts 1-2 weeks earlier than on the north coast. A few common seals have been reported breeding in September. The grey seal starts breeding in the late September with its maximum in Oct-November and continues until February-March. Because of the time of breeding the common seal is named the spring seal in Iceland and the grey seal the autumn seal. The hunting of seals in Iceland is almost entirely for their skins and therefore mostly pups are taken. Hunting for common seals pups takes place in May-June and for the grey seal pups during the period they are white. Only a few adults of both species are taken each year.

Because seal hunting is traditionally amongst the farms legal rights, no form of licence or catch quotas have been introduced up to now. Seal hunting in Iceland is therefore not organized, but is pursued by landowners, mostly farmers (in 1971 they were over 200). Up to now very little has been done in organized biological research on seals in Icelandic waters, but there does exist a great deal of

information and statistics of seal hunting for a long period of time. This information is taken from logbooks of commercial seal skin dealers.

All seal skins are exported, salted or dried and the external trade figures have their limitation because they only show how many seal skins are exported yearly, but do not necessarily reflect the annual catch.

Furthermore these figures do not show the composition of the skin by species nor from what part of the country they originate. Therefore the information taken from the commercial seal skin dealers seems to be more reliable and adequate.

Table 1 shows the seal total catches from 1897-1976. The mean annual catch in the years 1897-1919 was about 6000, then the catches declined reaching a minimum between 1939-1959.

In 1960 the catches suddenly increased again and have since annually been about 5000-7000 animals.

The decline after 1919 was probably not because of overhunting, but more likely due to changes in habits of life and occupation of the Icelandic people. There were reports of an epidemic in both seal populations in 1918 with high local mortality. This too could explain the subsequent fall in the seal catches in the following years.

The further decline after 1928 is more likely because of unfavourable prices of the skins. This continues to 1960 when the catches suddenly increased again.

Fig. 1 shows the correlation between the prices of the skin of the common seal pups and the catches for a ten year period (1962-1972). The two lines follow each other and the low skin price in the year 1967 is almost certainly the reason of the fall in catches that year (Arnlaugsson 1973). To give a better picture of the annual catch and its composition by species a correction is necessary according to the information from the commercial skin dealers. Table 2 shows the seal catch figures for the period from 1962-1976 which include the total seal catches and the catches of common seal pups, grey seal pups and the adults of both species.

According to these data the common seal pups are 89% of the total catches, the grey seal pups are 7.0% and adults only 4.0%. Maps 1 and 2 show the changes in the seal catches in nine regions where seal hunting takes place in Iceland. Map 1 is done for the years 1901-1945 and map 2 is for 1966-1971. The greatest changes in the seal catches

have taken place in region number 2 (decreasing from 38% of the total catch in the years 1901-1945 to 29.8% in the years 1966-1971), 4 (decreasing from 26.1% to 19.2% for the same period) and 8 (increasing from 7.5% to 25%).

These changes are probably due to the shift in the Icelandic population from rural to urban life.

As said before very little has been done to obtain biological data about the Icelandic seal stocks. Two years ago a seal research program started at the Icelandic Marine Research Institute in cooperation with another institution in order to clear up many questions of their ecological status. The program continues but no results have yet been published. Nevertheless the stock size of Icelandic seals has been estimated using the data available. For that purpose a program has been made by assuming the following: Females are sexually mature at 4 years of age (R4), sex ratio is 1:1.

This program is based on mortality between age 0 and 4 (% M (0-4)) fertility i.e. the average number of pups born to each female (F), the number of pups caught each year (C) and the number of seals in phe population for each pup born (G).

To maintain an equilibrium in the stock, the number of females attaining sexual maturity each year ($R4_{♀}$) must equal the total number of pups born each year (T) divided by F.

Thus: Ro = pups not culled

$$Ro_{♀} = R4_{♀} \cdot \left(1 \div \frac{\%\ M}{100}\right)$$

$$T = 2\,(Ro_{♀}) + C$$

$$T = F \cdot R4_{♀}$$

$$P = T \cdot G$$

Taking the common seal at Iceland. The average catch for 1962-1976 is 5679 pups. Assumed mortality (M 0-4) is 66%. Fertility F is 10 and G is 3.25. (Lockley, 1966).

$$Ro_{♀} = 4059$$

$$R4_{♀} = 1380$$

$$T = 2x4059 + 5679 = 13797$$

$$P = 3.25x13797 = \underline{44839}$$

As for the grey seal by using the same assuption and the average catch for 1962-1976 is 469 pups.

$R_{0♀} = 338$

$R_{4♀} = 115$

$T = 2x338 + 469 = 1145$

$P = 3.25x1145 = \underline{3722}$

The effects of changes in the assumed values M, F, G and C were explored. The relationship between G and P and C and P is linear but the relationship between M and P and F and P is non-linear.

This method gives estimates that agree quite well with estimates based on other methods.

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References

Arnlaugsson, T. 1973. Selir við Ísland (Seals at Iceland). Icelandic Fish. Lab. in Icelandic with English summary.

Bonnier, W. N. Population increase of Grey Seals at the Farne Islands North East England. Seals Research Division, Institute for Marien Environment Research Council, Fisheries Laboratory, Lowestoft, Suffolk England.

Lockley, R. M. Grey seal, common seal. Ebenezer Baylish & Son, Ltd. London 1966.

Table 1.

Total Seal Catches 1897-1976

Average catches:

	Adult seals	Pups
1897-1900	627	5412
1901-1905	748	5980
1906-1910	556	6059
1908-1912	711	5987

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1912-6593	1934-4307	1956-2318
1913-6711	1935-4277	1957-2326
1914-6475	1936-4443	1958-2370
1915-6162	1937-4395	1959-3773
1916-6164	1938-4062	1960-5415
1917-6012	1939-3857	1961-5262
1918-5950	1940-3488	1962-5786
1919-4784	1941-3439	1963-6573
1920-4972	1942-2980	1964-6002
1921-5048	1943-2888	1965-6503
1922-4811	1944-2453	1966-6599
1923-4868	1945-2299	1967-5674
1924-5410	1946-2317	1968-5726
1925-5345	1947-2522	1969-6170
1926-5401	1948-1809	1970-7236
1927-5627	1949-1300	1971-6830
1928-5666	1950-3486	1972-6598
1929-4992	1951-2770	1973-6962
1930-4050	1952-2909	1974-6240
1931-3783	1953-2275	1975-6443
1932-4016	1954-1812	1976-5891
1933-3973	1955-3186	

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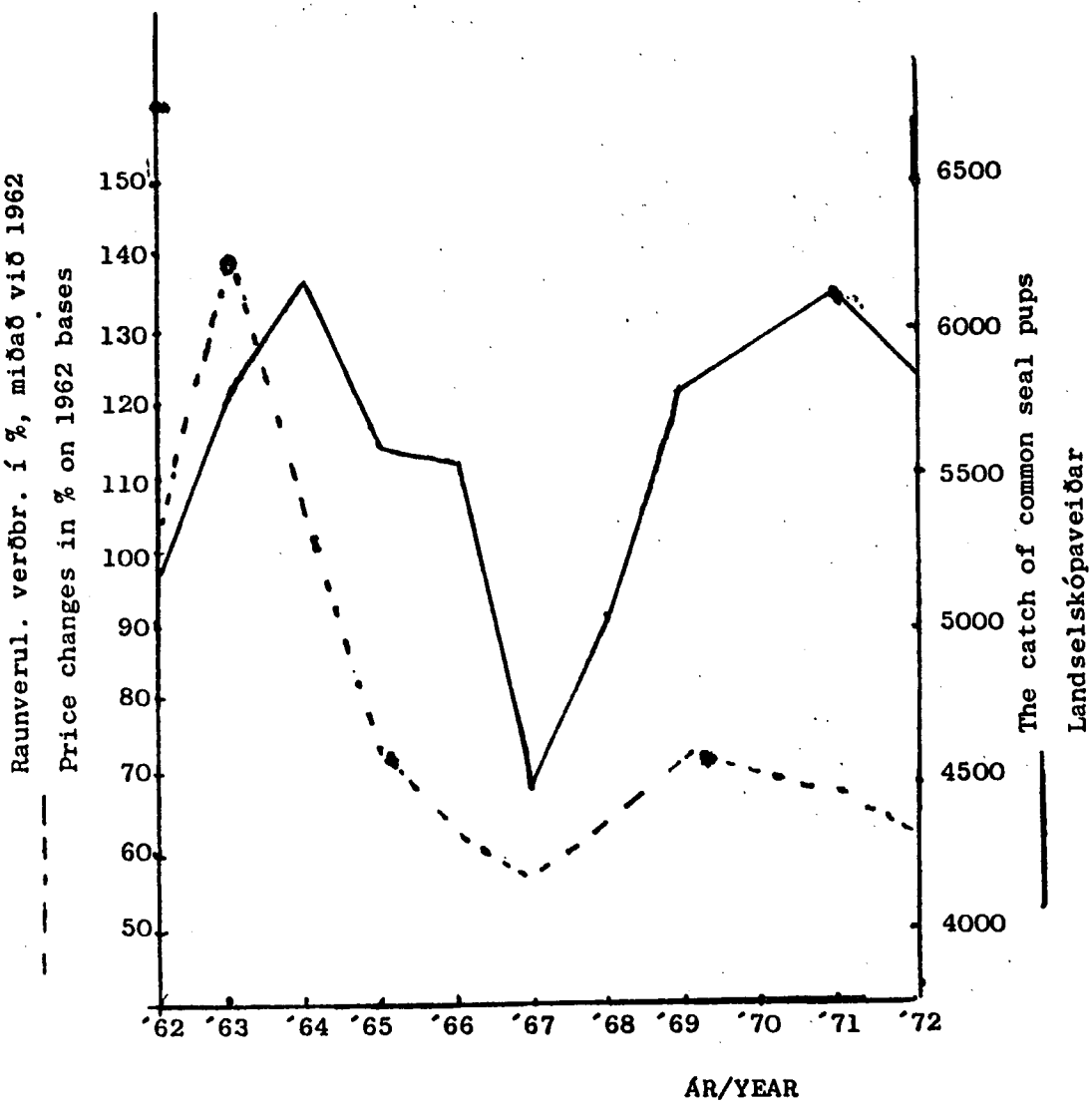
References:

Fisheries and subsidiary reports 1897-1945 and
External trade reports 1946-1976.

RIT 1. Hlutfall milli skinnaverðs og veiði landselskópa.

Fig 1 The correlation between the prices of the skins of the common seal pups and the catches.



This diagram is taken from " Selir við Ísland" by Teitur Arnlaugsson

Table 2.

Seal Catches in Iceland

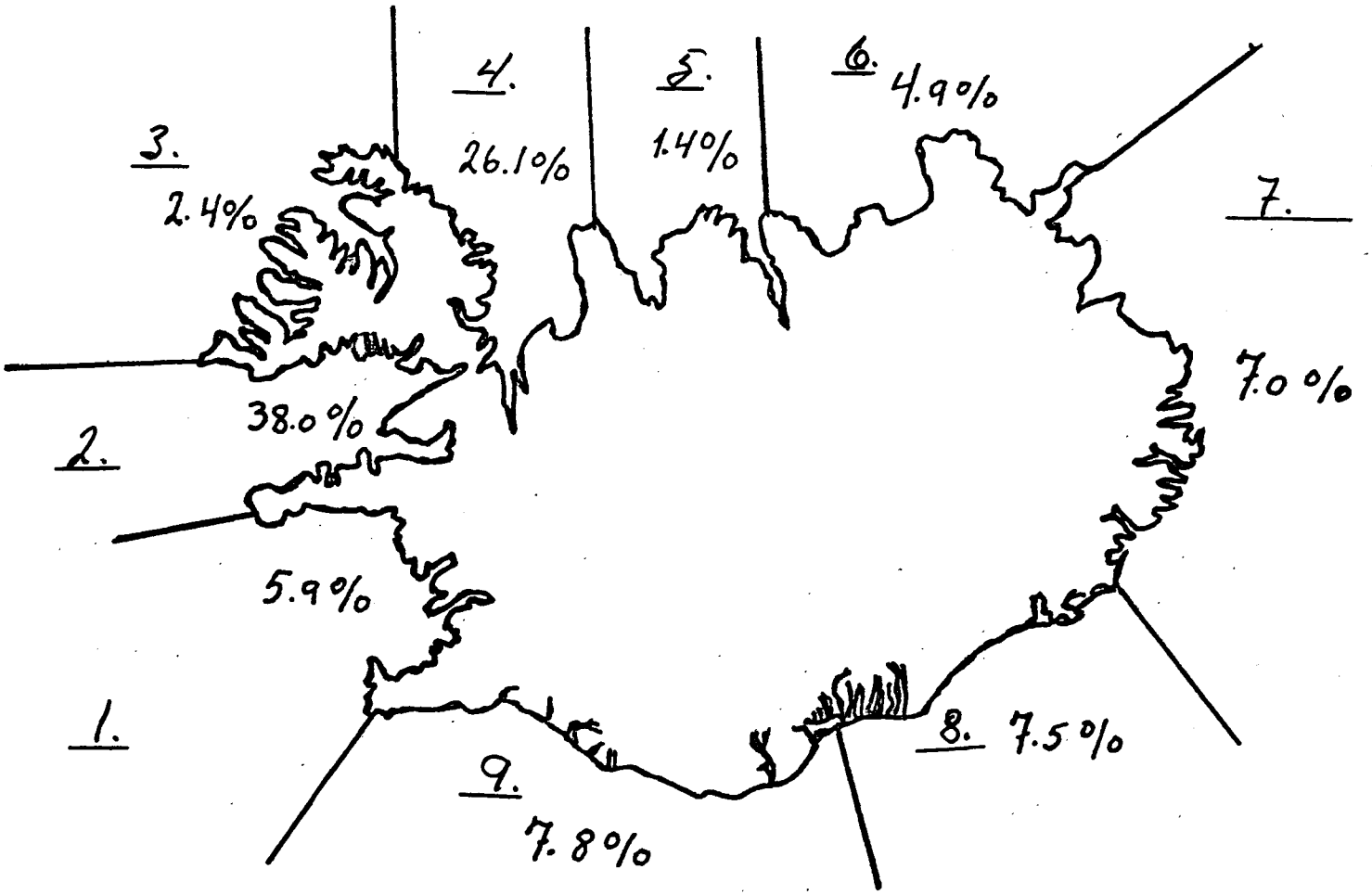
Year	Total catch	Common seal pups	Grey seal pups	Adult seals
1962	5786	5101	293	392
1963	6573	5795	568	210
1964	7063	6176	593	294
1965	6581	5598	767	216
1966	6148	5578	404	166
1967	4977	4481	449	47
1968	5726	5049	524	153
1969	6666	5831	579	256
1970	6740	5942	404	394
1971	6894	6126	557	211
1972	6930	6237	415	278
1973	6803	5996	483	324
1974	6240	5534	406	300
1975	6673	6111	122	440
1976	5891	5627	?	264
Total	95691	85182	6564	3945
Average	6379	5679	469	263

HEILDARVEIÐIN Í % ; MEÐALTAL 'ÁRANNA 1901–1945 (MEÐALTALIÐ 4710 SELIR).

TOTAL CATCHES IN % ; AVERAGE 1901–1945 (THE AVERAGE 4710 SEALS).

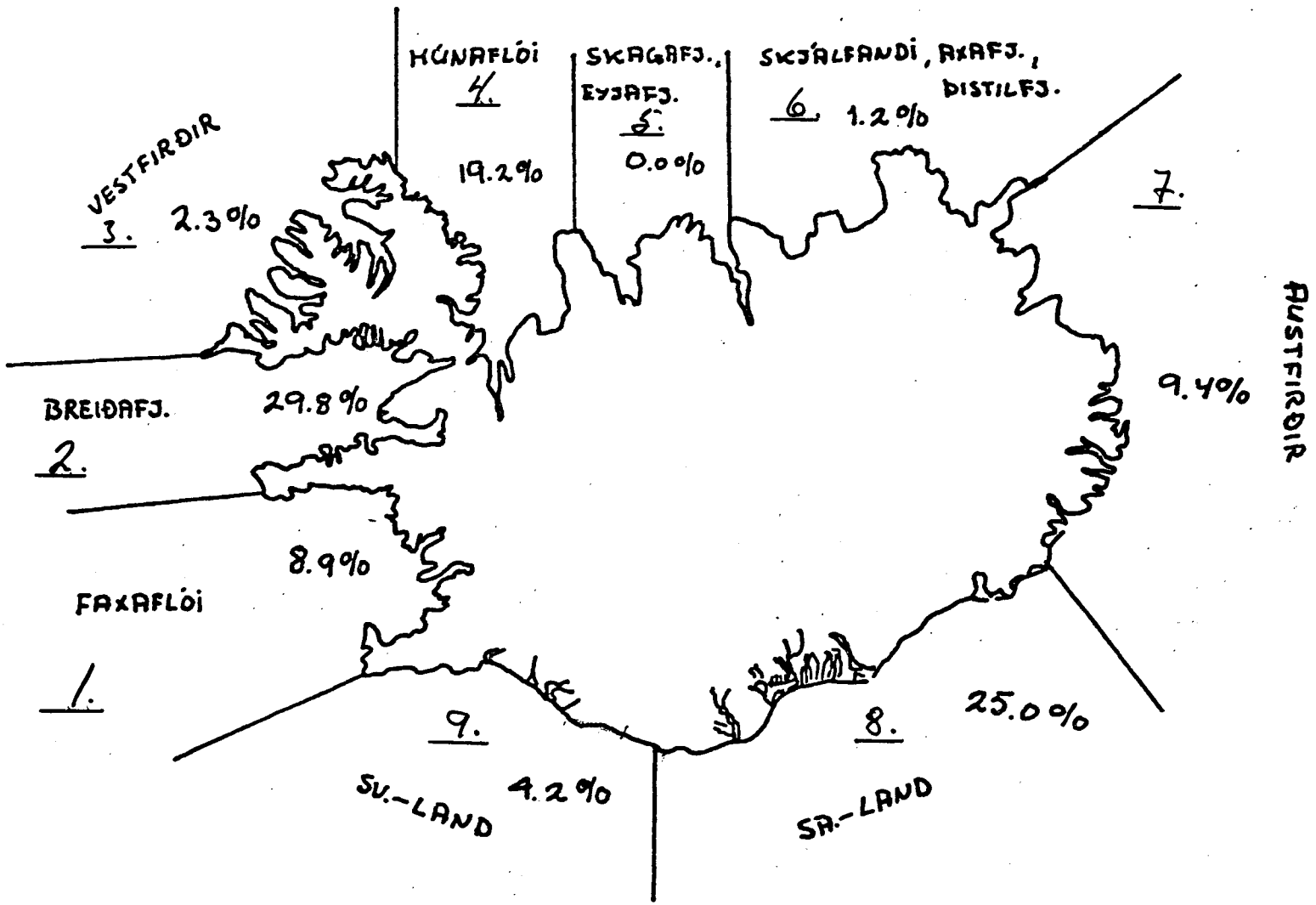
KORT GERT AF JÓNI JÓNSSYNI FISKIFRÆÐINGI.
AFTER J. JÓNSSON, UNPUBLISHED.

Map 1



HEILDARVEIÐIN í % ; MEÐALTAL ÁRANNA 1966-1971 (MEÐALTALIÐ 6012 SELIR).
TOTAL CATCHES IN % ; AVERAGE 1966-1971 (THE AVERAGE 6012 SEALS).

Map 2



This map is taken from "Selir við Island" by Teitur Arnlaugsson