

Seals



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of arctic and eastern Canada

by A. W. Mansfield

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OTTAWA, 1963

SEALS OF ARCTIC AND EASTERN
CANADA

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Seals of Arctic and Eastern Canada

By A. W. Mansfield

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In addition, the Board publishes the following:

An ANNUAL REPORT of the work carried on under the direction of the Board.

The JOURNAL OF THE FISHERIES RESEARCH BOARD OF CANADA, containing the results of scientific investigations.

All publications of the Fisheries Research Board of Canada still in print are available from the Queen's Printer. Bulletin No. 110 is an index and list of publications of the Board to the end of 1954 and is priced at 75 cents per copy post-paid. Circular No. 58, available upon request from the Fisheries Research Board, Ottawa, lists its publications during 1955-1960.

For a listing of recent issues of the above publications see inside of back cover.

INTRODUCTION

This bulletin is intended to provide a means of identifying the seals of arctic and eastern Canada, and a summary of the more important facts of their life histories. It has been written primarily for the fishermen and fisheries officers of our east coast and those government officials who are responsible for teaching and administering the affairs of the native peoples throughout the arctic. The facts quoted are sometimes based on meagre data, and we would be very grateful if interested observers would send us any information which will improve our knowledge of the animals described.

The seals belong to the *Pinnipedia*, the group of 'fin-footed' animals which also includes the walruses, sea lions and fur seals. Strictly speaking, the title of this booklet should have referred to the *Pinnipedia* rather than just 'seals', since both the walrus and the fur seal are described; but since the word is unfamiliar to most people it is best ignored.

Like ourselves, the pinnipeds are mammals; that is they are hairy, warm-blooded, air-breathing animals which suckle their young. Though they are so well adapted to life in the sea, they are never entirely free of land or ice, for they must return there to rest occasionally (the fur seal excepted) and to give birth to their young. They are insulated from the cold by a thick layer of blubber just underneath the skin, as in the true seals and walrus, or by a thin layer of blubber and a coat of stout guard hairs and dense underfur as in the fur seals.

Swimming is performed in several ways. The true seals or *Phocidae* rely mainly on their hind limbs which are moved from side to side in a sculling action. These limbs are turned permanently backwards and are of little use when the animal is moving on land or ice. The eared seals or *Otariidae*, which include the sea lions and the fur seals, have well developed paddle-like foreflippers which are mainly used for swimming, though the hind limbs are still used in a side to side motion as in the seals. When on land, the hind limbs can be brought forward under the body, but their movements are restricted since they are joined near the heels. The walrus, the only member of the *Odobenidae*, is different again, having hind-flippers which can be turned under the body for moving on land, but which are also used as the main swimming organs, as in the true seals.

Apart from these visible adaptations to life in the water, the pinnipeds also have internal adaptations which enable them to swim easily underwater and remain submerged for periods as long as 20 minutes in the larger species. However most of these adaptations involve the anatomy and physiology of the blood system and need not concern us here.

Reproductive processes and care of the young are closely adapted to the pinniped's existence. Usually only one pup is born at a time and is suckled by the mother for up to several months after birth. The milk is very rich in fat, containing up to ten times as much fat as cow's milk in some species of seals, which explains the rapid growth of the young.

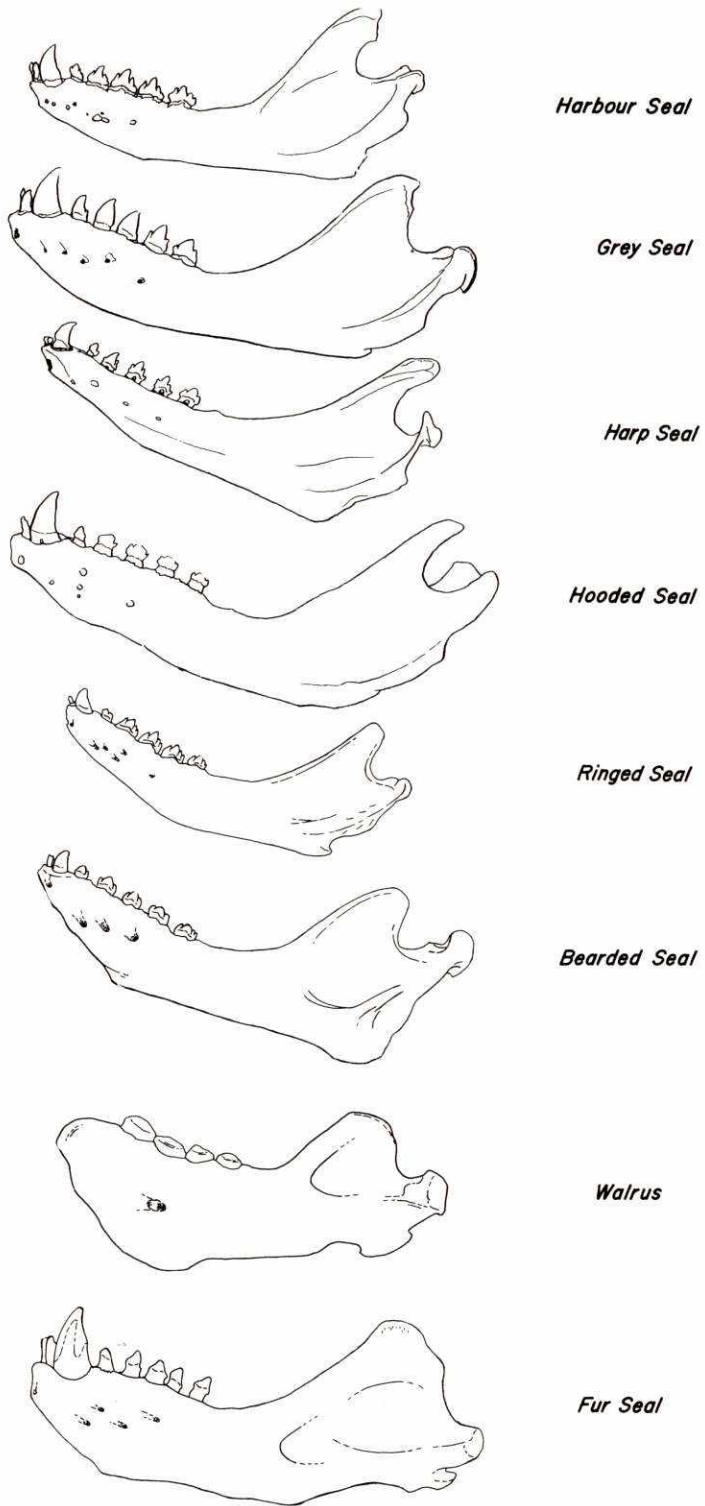
A few days to several weeks after birth of the young, usually at or near the end of the suckling period, the female mates again. Growth of the new embryo is very slow at first and several months elapse before visible signs of development occur in the uterus. The phenomenon, in which the embryo remains in a rudimentary condition for many weeks, is known as *delayed implantation* and is particularly important in the life histories of pinnipeds. The delay before the embryo fixes itself to the uterine wall and begins to develop into a recognisable form is usually so timed that the whole reproductive cycle from one birth to the next takes exactly one year. When the cycle does take over a year, as in the walrus and bearded seal, the female cannot mate until the following year and thus young are born only in alternate years.

Feeding habits of pinnipeds are varied. Most of the free-swimming and bottom-living fish and larger crustaceans are eaten, as well as molluscs and echinoderms. Food habits of each species are dealt with in detail in the text.

In some areas pinnipeds may feed on economically important fish such as salmon, or may act as carriers in spreading parasitic nematode worms which reduce the market price of other fish such as cod. In consideration of traditional fishing interests in the Maritime Provinces and Newfoundland, a general bounty has been placed on the harbour seal, and a limited bounty on the grey seal in the Miramichi estuary. Since 1950 a reward of \$5 has been paid for each pup killed and \$10 for each adult. Claims must be accompanied by the complete jawbone of the seal so that proper identification can be made by the fisheries officers. The illustrations show that each species of seal can be readily distinguished from all the others on shape and structure of the teeth and jaws alone.

The teeth are also useful in providing a means of telling the age of individual animals. In most pinnipeds the teeth grow by the addition of layers of dentine within the pulp cavity, and layers of cementum on the outside of the tooth. When the tooth is cut across, the layers can be seen as concentric rings, rather like the growth rings in a tree trunk. As in the tree, each clearly defined ring represents one year of the animal's life. This technique of ageing has been most important in the assessment of the populations of some species of seals.

Most of the pinnipeds described have been actively exploited by man for many years. The harp and hooded seals, and the northern fur seal, support multi-million dollar industries. The sealers have always applied their own names to particular stages in the life histories of the seals, and these traditional names are still retained. Originally 'dog' and 'bitch' were used to designate the adult males and females, particularly in the eared seals, the young being known as 'pups'. Later 'bull' and 'cow' began to be used more frequently for adult animals, particularly the true seals, but 'pup' was retained for the young. In Canada the word 'calf' is used only for young walrus and sometimes grey seals.



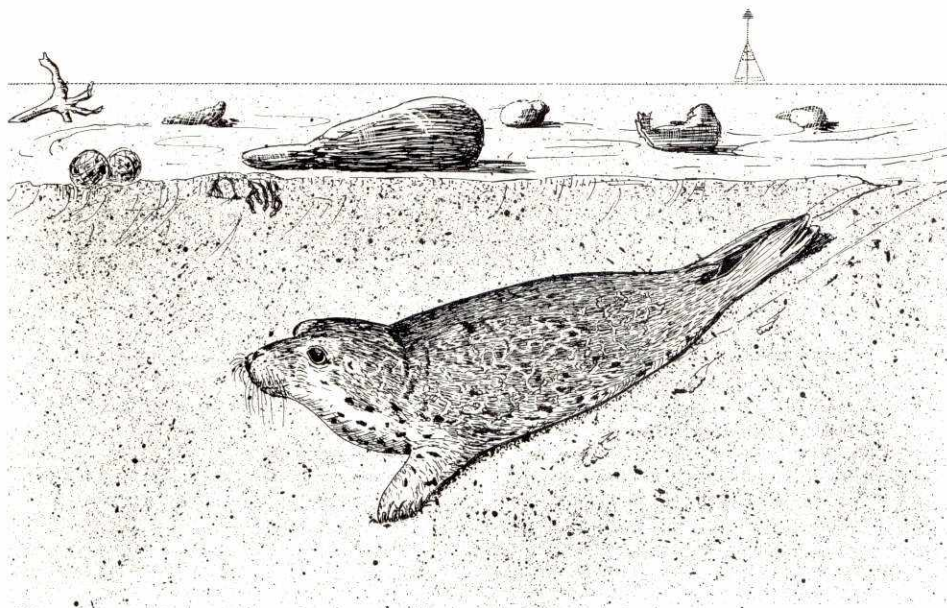
Lateral views of left lower jaws of seals ($\times \frac{1}{3}$) and of walrus ($\times \frac{1}{4}$)

HARBOUR SEAL

Phoca vitulina

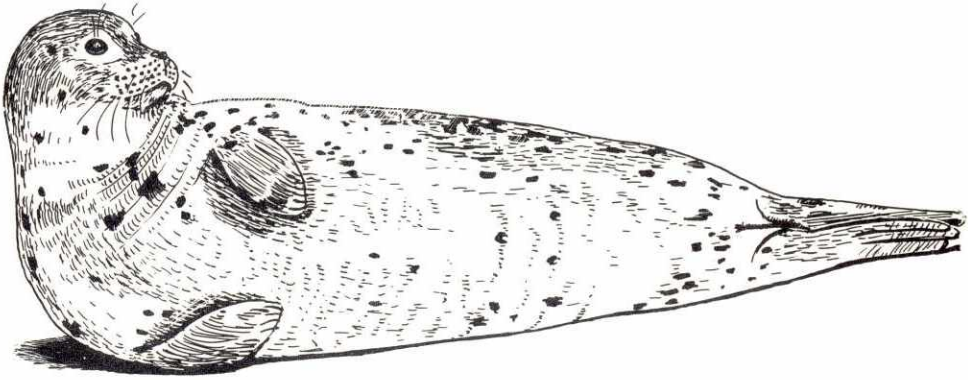
ADDITIONAL NAMES. Bay, common and spotted seal. *Phoque commun*, *loup marin d'ésprit*. In Newfoundland—ranger (young) and dotard or doter (adult). Eskimo: *Kasigiak*.

CHARACTERISTICS. A widely scattered seal which may congregate into groups of up to several hundred in the breeding season and during the late summer and fall in favoured feeding areas. It has a liking for fresh water and is often found in estuaries, rivers and lakes, sometimes far from the sea. It is essentially an animal of open water and is never associated with fast ice. However it does reside in certain arctic localities, but only where tide rips, swift currents and river outflows enable small areas to remain ice-free throughout the winter. Immature seals may wander far from their birth place, but the adults appear to be sedentary. In the water this seal is active and playful, stretching its fore and hind flippers, rolling and leaping and sometimes swimming in circles. YOUNG. The foetal coat of long white hair is usually moulted shortly after birth, though occasionally it may be shed in the womb. Harbour seals living in the arctic invariably produce young which retain the long white coat for some days or weeks after birth. The first



HARBOUR SEAL

Typical adult from Maritime Provinces



HARBOUR SEAL

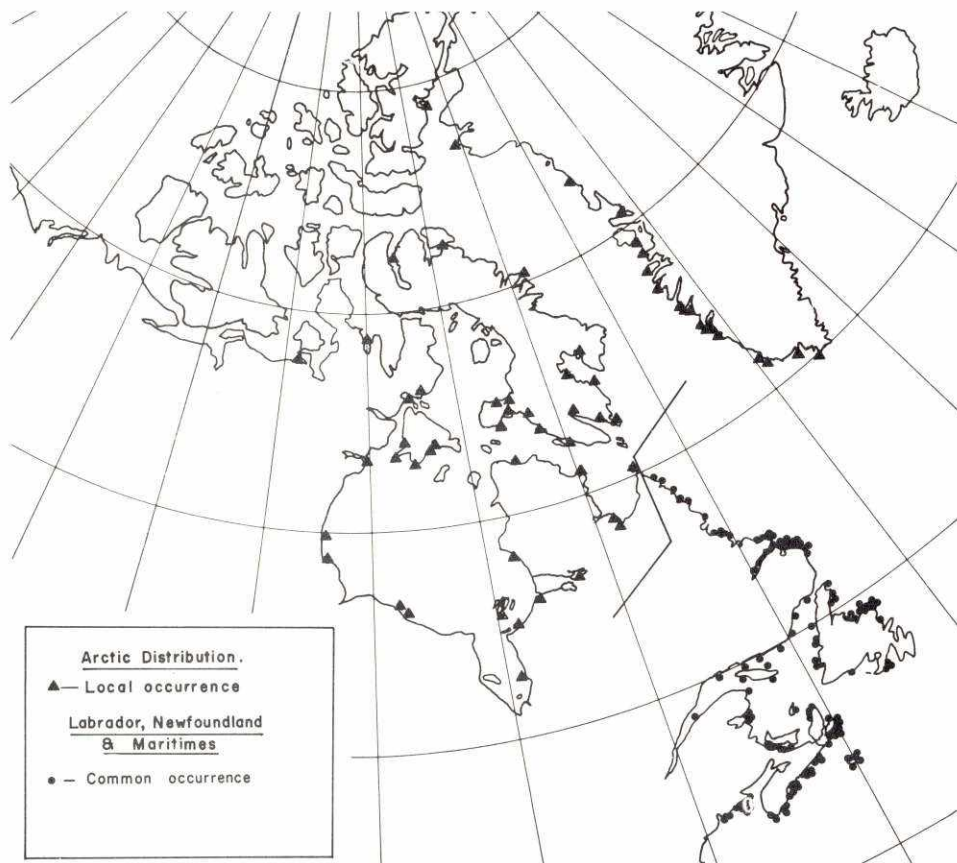
Immature with lightly spotted belly

hair coat is bluish grey above and silvery white below with faint indications of the spotted markings of the adults. New-born pups average 32 inches long and 20 lb. in weight, increasing to 38 inches and 55 lb. during the first summer. **ADULT.** Average length of both sexes 60 inches and weight about 200 lb. The pelage pattern of both immature seals and adults is very variable, but essentially it is bluish grey on the back with an overlying scattering of black spots and a whitish network which may be broken up into small rings and loops here and there; the belly is silvery white with scattered dark spots. In arctic harbour seals the back and belly are more uniformly dark with a fainter pattern of white markings.

REPRODUCTION. In the southern part of its range the harbour seal gives birth to its young from mid May to mid June, usually on sandbanks and mudflats in river estuaries and on reefs and rocky islets along the coast. The pups are precocious in their swimming habits since they must often take to the water before the next high tide covers their birth place. In the arctic pupping occurs in late June and early July in similar habitats. The pups remain with their mothers for three weeks or more after birth, hauling out at favourite resting places between tides to suckle.

FEEDING. The two most common items of food eaten by harbour seals taken in the Maritime Provinces are herring and winter flounder. Occasionally when squid are running, they form the main diet. Other species eaten include salmon, hake, cod, haddock, smelt, shrimps, alewives, redfish and shad. Little is known of the diet of arctic harbour seals, though it most probably includes salmon, char, brook trout, whitefish, sculpins and capelin. The wide variety of food eaten by the harbour seal confirms what we know of its habits in Europe and the Pacific; namely that it shows no particular preference for any one kind of food but takes what is most readily available.

DISTRIBUTION. WORLD: the common seal of middle and northern Europe. Occurs also in Iceland, Greenland, eastern and western North America, northern China, Japan and eastern Siberia. CANADA: widely distributed and common in British Columbia and throughout the east coast. *Nova Scotia*—most common from Shelburne to Louisburg. *New Brunswick*—Miramichi estuary and coast below Saint John. *Prince Edward Island*—Pownal Bay area. *Quebec*—St. Lawrence River at Trois Pistoles, and Cape Gaspé. Occasional immatures wander as far



as Montreal and Ottawa. Distribution along the north shore and around Anticosti Island is uncertain, though seals were formerly found at the mouths of nearly all rivers flowing into the St. Lawrence. *Newfoundland*—common on west and south coasts, and east coast except for Trinity and Conception Bays and the east of Avalon Peninsula. Also common at the Magdalen Islands and Sable Island. Harbour seals occur all along the Labrador coast and in certain localities in the arctic. Notable is a small freshwater population of unknown size which is apparently confined to Upper and Lower Seal Lakes on the Nastapoka River in western Ungava. A similar population probably still exists in Seal Lake on the North River in Hamilton Inlet, Labrador.

REMARKS. In the Maritime Provinces and Newfoundland, harbour seals have little economic value. Since they cause damage to fisheries by acting as carriers of the 'codworm' *Phocanema decipiens* and interfering with the netting of salmon and herring, they have always been a particular enemy of fishermen. To keep such damage to a minimum, the Department of Fisheries of Canada has placed a bounty on harbour seals, paying \$5 for each pup under one year old and \$10 for each adult seal killed. Hunters are required to submit the lower jaws of all seals taken as valid evidence for their claims. Since 1955, a yearly total of between 1,500 and 2,000 bounty claims from the Maritime Provinces, Newfoundland and Labrador has been submitted for payment. Along the Labrador coast and in the arctic the harbour seal is of some local economic importance. It supplies both meat and blubber for humans and dogs, but above all is prized for its handsome coat which is used for making fur garments.

GREY SEAL

Halichoerus grypus

ADDITIONAL NAMES. Atlantic seal, horse head. *Phoque gris, tête de cheval.*

CHARACTERISTICS. A widely scattered seal of northern temperate and sub-arctic waters occurring in Canada in concentrations of up to several hundred adult females in the breeding season, and in numbers rarely exceeding 500 in certain favoured summer feeding areas. The young animals frequently wander long distances away from their place of birth. There is a marked sexual difference in both size and colour of adults. The male, as in the hooded seal, is much larger than the female. YOUNG. New-born pups average 35 inches long and 30 lb. in weight, increasing to about 42 inches and 100 lb. at weaning. The long silky natal fur is white, occasionally with pale greyish brown patches on the back and sides. The nose

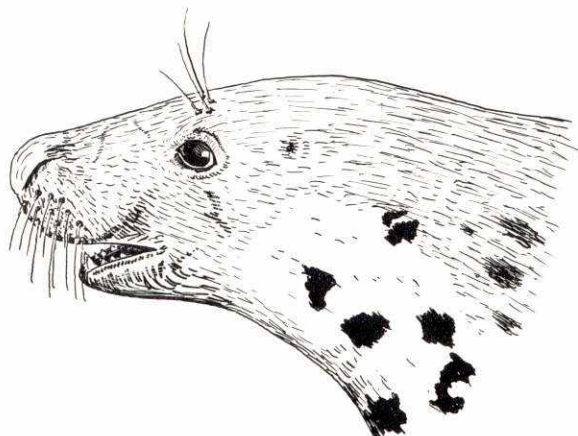


GREY SEAL

Adult female and whitecoat pup (left), and adult male (right)

is generally black and devoid of natal fur even in the youngest pups. The white coat is shed after 3 to 4 weeks and replaced by a coat of short stiff hair of a distinctive pattern. The basic colour is silver grey, slightly darker on the back, and the whole is overlain with a mottled pattern of large black splotches. *ADULT. Male.* Average length 94 inches. Coat colour a dark grey, almost black, with small patches of lighter grey on the flanks which may join into a continuous pattern. The overall effect is very dark. In older males the snout becomes considerably elongated and rounded, giving the profile a characteristic outline. The shoulders become heavier and the skin is usually thrown into folds which become scarred from fighting. *Female.* Average length 80 inches. Coat colour a smoky grey on the back becoming silver grey or even white on the sides and belly; the whole overlain with splotches of dark grey or black which merge in older animals. Overall effect much lighter

GREY SEAL
Adult female



and more mottled than in the males. Immature males and females show a much less pronounced mottling effect than the adults, though this changes in two or three years to the adult pattern.

REPRODUCTION. The pups are born in late January and early February on islands or on fast ice close to shore. Winter storms often cause great loss of life amongst the pups by drowning those born too near the water's edge, or by breaking up the landfast ice and carrying it out to sea. The females suckle the pups for about three weeks during which time they mate with the older male seals which lie about the breeding colony. Mating may occur in the water, though it is performed frequently on land or ice where disturbance is minimal.

When pupping occurs on the land a loose social organisation of pregnant females with considerably fewer dominant males is formed, while on the ice a much closer ratio between breeding males and females is apparent. Family units of an adult male together with a female and pup are common, suggesting that monogamy may be frequent.

FEEDING. Adult seals feed chiefly on skates, flounders, cod, hake and herring, and occasionally on salmon, smelt, haddock, sea-bass, dogfish, squid and crustaceans.

DISTRIBUTION. WORLD: confined to three main areas in the North Atlantic: Eastern Canada and the extreme northeastern United States; Great Britain, Iceland, the west and north coasts of Norway and the White Sea; the Baltic



Sea. CANADA: found as a summer resident in the following areas: *St. Lawrence River*—Anticosti Island, Mingan Islands and along the south shore as far as Trois Pistoles. *Maritime Provinces*—Miramichi estuary, Northumberland Strait, east and west coasts of Cape Breton Island and the Bras d'Or lakes, east coast of Nova Scotia, southern Bay of Fundy, Sable Island and the Magdalen Islands. *Newfoundland*—Port au Port Bay in the west, Fortune Bay in the south, Hare Bay in the northeast and Notre Dame Bay. *Labrador*—Strait of Belle Isle to as far north as Hebron.

Known breeding colonies occur at the Magdalen Islands (Deadman Island), Amet Island in Northumberland Strait, Sable Island, Point Michaud on the

east coast of Cape Breton Island and on the fast ice along the west Cape Breton shore from the Strait of Canso to Inverness. During the late spring and summer there is a dispersal away from the breeding colonies, particularly by the young seals of the year. These and other immature animals account for most of the annual kill of grey seals in Newfoundland and Labrador. Adults tend to disperse far less, though there may be pronounced local movements. For example, a group of grey seals arrives in the Miramichi estuary in spring, presumably from the breeding colonies in Northumberland Strait and at the Magdalen Islands, and leaves again in early winter.

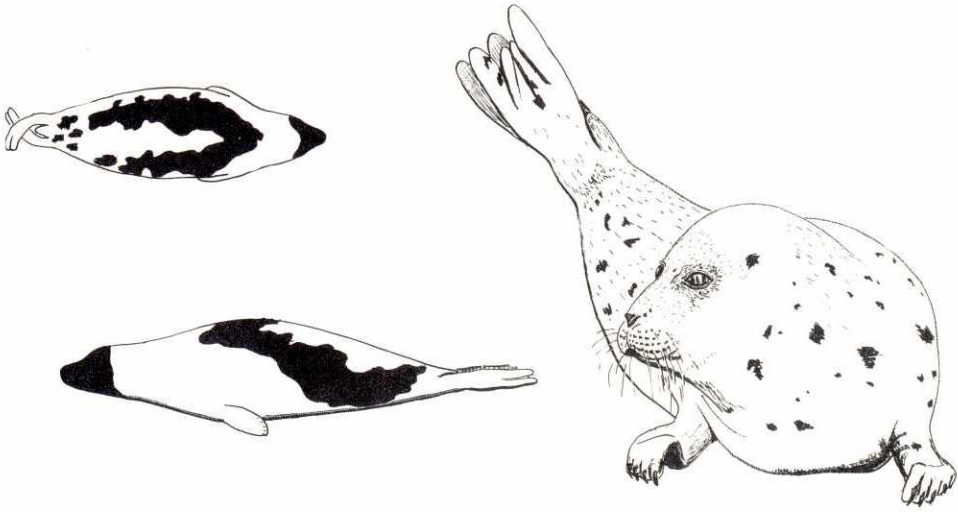
REMARKS. Owing to their scattered distribution and small numbers, grey seals have little economic value. They cause damage to fisheries in two ways. Firstly, they harbour the adult form of a worm (*Phocanema decipiens*), the immature stage of which occurs in the flesh of cod and some other fish, and which, though harmless, renders the fish less attractive to the consumer and therefore less readily marketable. Secondly, they interfere with fishing operations, particularly with gill nets and set nets for salmon. In the Miramichi estuary, where they might become numerous enough to do serious damage to the salmon fishery, they are controlled by a bounty placed on them by the Department of Fisheries of Canada.

HARP SEAL

Phoca groenlandica

ADDITIONAL NAMES. Greenland seal, saddle seal, saddleback. In Newfoundland, new-born pups are called "whitecoats", fully moulted pups "beaters", and other immature seals "bedlamers". *Phoque du Groenland, loup marin à brasseur*. Eskimo: *Kairulik*.

CHARACTERISTICS. A gregarious migratory seal occurring in large breeding concentrations estimated to number about 430,000 seals off southern Labrador and 210,000 in the Gulf of St. Lawrence in 1960. On migration they are very active, leaping and cavorting in small schools like porpoises, and sometimes swimming on their backs. YOUNG. New-born pups average 36 inches long and 15 lb. in weight, increasing to 45 inches and 80 lb. at weaning. They are born with white silky fur which begins to shed after about a week, starting from the head and along the back. In 3 to 4 weeks the moult is complete and the white natal fur is replaced by a coat of coarse shorter hair. This is a silvery colour with small dark irregular splotches. ADULT. As the animal grows older the spots grow larger and a dark saddle begins to develop along the flanks and over the back. Fully adult animals of both sexes have a dark face and saddle, often somewhat lighter in the female than in the male. Young females may still retain the spotted coat for some years after attaining sexual maturity. Adult length about 64 inches in both sexes and weight approximately 300 lb.



HARP SEAL

Adult males in dorsal and lateral views (left)
and juvenile spotted seal or 'beater' (right)



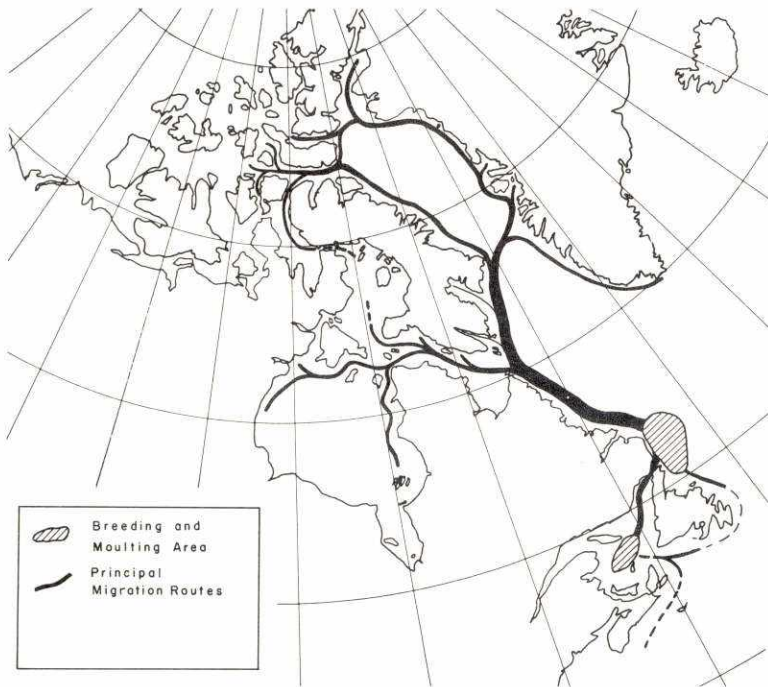
HARP SEAL

Young adult female with "bedlamer" markings and darkening saddle, and
newborn 'whitecoat'

REPRODUCTION. The pupping season lasts from late February to mid March. The whitecoats are born on the ice and suckled by the cow for 3 to 4 weeks. Towards the end of this period the females mate with the males which are scattered throughout the breeding area.

FEEDING. Little or nothing is eaten by the adults during the breeding period and moult. In spring and summer the immature seals feed extensively on small shrimp-like planktonic crustaceans (mysids and euphausiids), while the adults eat both these and polar cod, capelin, herring, squid, and occasionally groundfish such as cod, witch and plaice.

DISTRIBUTION. WORLD: confined to three isolated groups breeding in the White Sea, the 'West Ice' southwest of Spitsbergen, and Newfoundland and the Gulf of St. Lawrence. **CANADA:** a summer resident in the arctic, reaching as far north as Jones and Lancaster Sounds, and Thule in northwestern Greenland. In early May the moulting adults, followed soon by the 'beaters' begin to leave the moulting patches off Newfoundland and Labrador and move north along the Labrador coast. They pass Cape Chidley in northern Labrador towards the end of June and continue northwards, the main body going to Davis Strait and Baffin



Bay, while small numbers move westward into Hudson Bay, reaching Southamton Island and occasionally as far south as the Belcher Islands. Large numbers are seen passing Bylot Island on their way north throughout July and in early August, and again in late August and September on their return migration.

Some immature seals remain behind in the arctic throughout the winter, particularly in western Greenland. By early November large numbers again pass Cape Chidley on their way south. In January part of the population goes through the Strait of Belle Isle into the Gulf of St. Lawrence, while the remainder moves down the east coast of Newfoundland. In late February harp seals are found on the ice usually to the north or west of the Magdalen Islands in the Gulf of St. Lawrence, and off the coast of Labrador from Belle Isle to Hamilton Inlet. These breeding areas are known as the 'Gulf' and 'Front' respectively.

At the end of the breeding season in late March, the adult males appear on the ice to moult, followed closely by the immature seals and then the adult females. The 'Front' group remains off the coasts of Newfoundland and Labrador, drifting along with the moving pack ice and swimming north by stages, while the 'Gulf' seals remain about the Magdalen Islands until late April where they moult in the open water. In May they move northwards through the Strait of Belle Isle and follow the 'Front' herds up the Labrador coast.

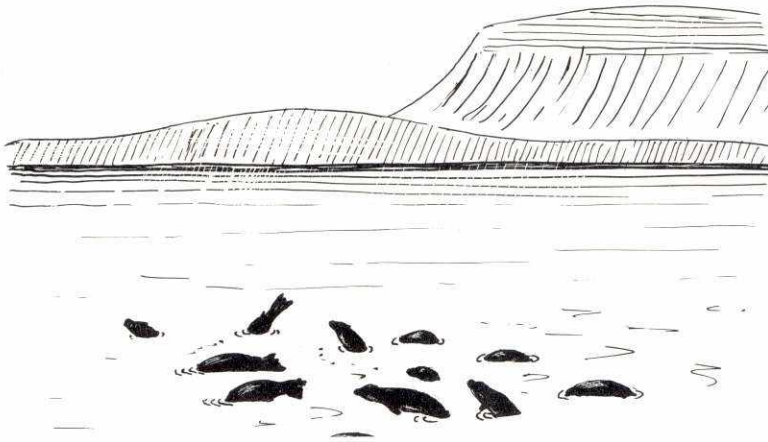
REMARKS. The harp seal herds of the 'Front' and 'Gulf' have been exploited since the late 19th century by ships from the Maritime Provinces and Newfoundland, and since 1938 by Norway. The sealing industry produces three major commodities, oil, fur and leather. The 'whitecoat' is the most valuable source of all three, and in particular is the basis of the fur stock. The hair coat of the 'beater' is also important but is subject to more market fluctuations than 'whitecoat' fur. Average annual catches are shown in the accompanying table:

<i>Year</i>	<i>Pups</i>	<i>Immatures and adults</i>	<i>Total</i>
1895-1911	228,300	21,000	249,000
1912-1940	134,250	25,350	159,600
1941-1950*	59,800	31,500	91,300
1951-1960	196,200	86,400	282,600

*No hunting took place in 1943.

To these numbers must be added another 50,000 annually to represent the landsmen's catches from Canada and western Greenland. In Canada these catches for the most part are taken in nets: from southward migrants along the Labrador in late fall and along the north shore of the Gulf in January, and again from northward migrants at Blanc Sablon in the Strait of Belle Isle in spring. Smaller numbers of seals are taken on baited long lines at the Magdalen Islands in spring, and from the ice when this comes close to shore during the breeding season.

The Greenlanders take a substantial portion of this catch in open water in summer, but in the Canadian arctic the catch of harp seals by the Eskimos is only incidental to the hunting of ringed and bearded seals. However catches might be considerably improved by the use of simple set nets.



HARP SEAL

A small herd swimming

The consistently large catches of harp seals have resulted in a decline of the population from an estimated total of over 3,000,000 in 1951 to about 1,250,000 in 1960. Unless conservation measures are carried out soon, it appears that the industry must face a rapid decline and eventual cessation.

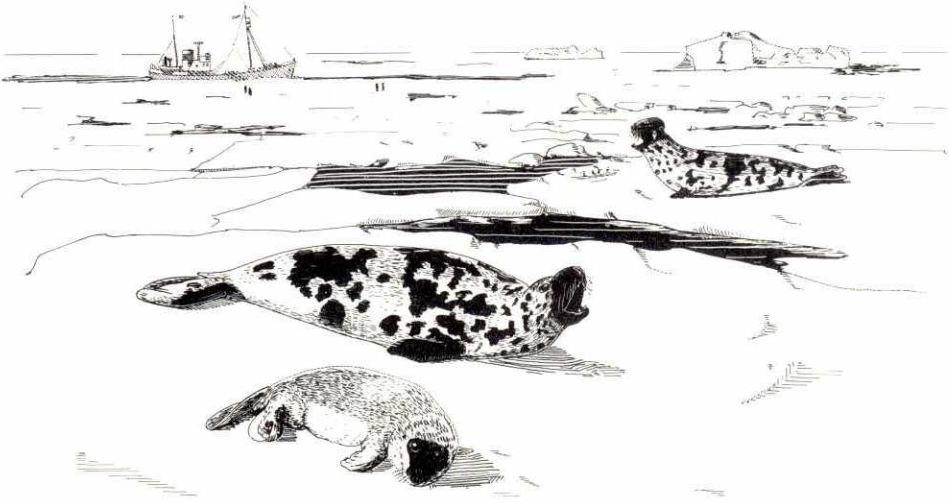
HOODED SEAL

Cystophora cristata

ADDITIONAL NAMES. Bladdernose, crested seal; young in first hair coat 'blueback'. *Phoque à capuchon*. Eskimo: *Netsivak*. Greenlandic: *Natsisuak*.

CHARACTERISTICS. A migratory seal which congregates in the breeding season in large but widely scattered groups on the pack ice off the coast of Labrador or northeast Newfoundland and in the Gulf of St. Lawrence. The main concentration of hooded seals is usually found on heavier ice to seaward of the breeding herds of harp seals at the 'Front', as the area of ice off the Labrador coast is known to sealers. The male is apparently monogamous and is often found together with the female and new-born pup on the ice. There is a marked sexual difference in adults, the male being much larger than the female. YOUNG. The foetal coat is a light greyish colour and is shed before birth. The moulted hairs are swallowed by the foetus and are excreted into the amniotic fluid as compact felt discs about $1\frac{1}{2}$ inches across and $\frac{1}{4}$ inch thick. They are also found on the ice about the pup several days after birth. The first hair coat or 'blueback' is slate-blue coloured dorsally, shading fairly abruptly to light silver grey on the sides and belly. The muzzle of the pup is black to just behind the eyes. Length at birth about 36 inches. ADULT. *Female*. Average maximum

length 80 inches. The bluish colour on the back is overlain by a pattern of irregular black spots 3 or 4 inches across which decrease to about 1 inch in size on the neck and belly. As in the pup, the face is black to behind the eyes.



HOODED SEAL

Adult female with 'blueback' (left), and adult male with proboscis erected (right)

Male. Average maximum length 92 inches and weight about 700 lb. The hair coat is marked exactly as in the female. The most striking character is the proboscis which overhangs the upper lip in older animals. When angered, the male erects this and sometimes rapidly everts the mucous nasal septum from one of the nostrils as a bright red bladder.



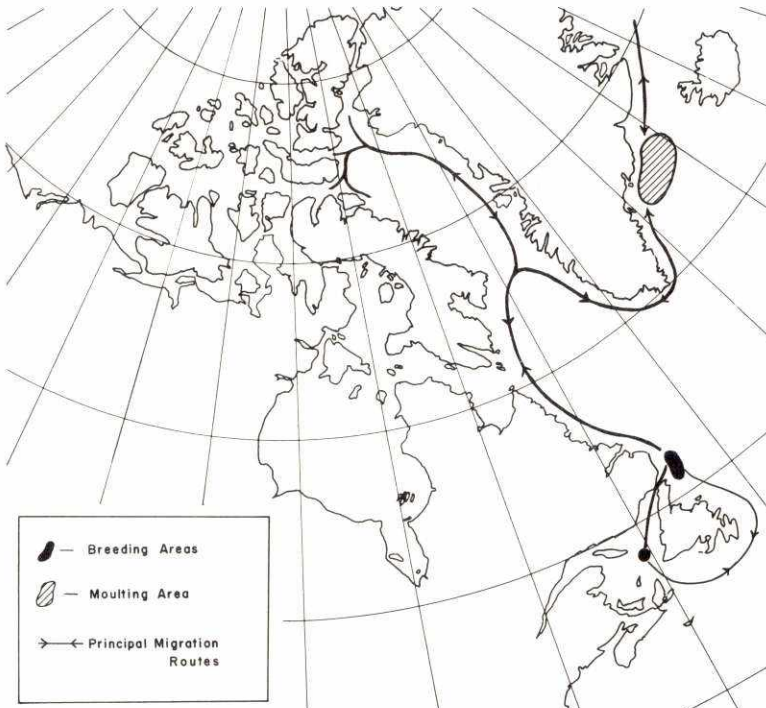
HOODED SEAL

Adult male at rest (left), and adult male with proboscis erected (right)

REPRODUCTION. The pup is born in the last half of March and is suckled for 8–10 days by the female. During this time the adult male lies out on the ice near the female, ready to mate with her just after the end of the nursing period. Most females mature at 4–6 years of age and produce one pup every year. The males mature at 4–6 years of age also. Maximum life span of both sexes is about 30 years.

FEEDING. Redfish, Greenland halibut and squid have been found in stomachs, suggesting that the hooded seal dives to depths greater than 100 fathoms where this food is most abundant. The adults appear to fast during the breeding period. The feeding habits of immature seals are unknown.

DISTRIBUTION. WORLD: the two known breeding grounds are restricted to the 'Front' and 'Gulf' in Canada and the 'West Ice' to the north of Iceland. **CANADA:** after the breeding season is over, the seals leave the pack ice in the 'Gulf' and east of the 'Front' and migrate northwards to Greenland, reaching the coast at Sukkertoppen and Holsteinsborg in late April and early May. Most then turn south towards Julianehaab where they remain until early June. They then move eastwards about Cape Farewell to the moulting grounds in Denmark Strait between Iceland and Greenland. A small proportion of the herds turn



northwards up the West Greenland coast and are taken in the Thule district from June to August. It is at this time, and on the return migration in September,

that hooded seals are occasionally seen in northern Baffin Island, Devon and Ellesmere Islands. At the southern end of its range rare strays have been taken as far south as Florida.

REMARKS. Hooded seals are taken during the spring harp sealing at the 'Front' by vessels from Newfoundland, the Maritimes and Norway. Owing to uncertain ice conditions and the difficulties of locating the breeding seals in some years, the catches fluctuate markedly. Thus nearly 14,000 hooded seals were taken in 1956 compared with 144 in 1957. However over the ten-year period from 1949 to 1958 an average catch of 5,800 was taken, the Norwegian vessels accounting for two thirds of this. 'Bluebacks' form the more important part of the kill, averaging 66% of the total catch from the 'Front'.

The largest catches of hooded seals come from the 'West Ice'. Norway takes an average of 70,000 per year, nearly 38,000 of which are 'bluebacks'. The Russian catch from the 'West Ice', which began in 1954, is unknown. Further small catches of about 1,000 per year are made in Greenland, mostly along the southwest and southeast coasts.

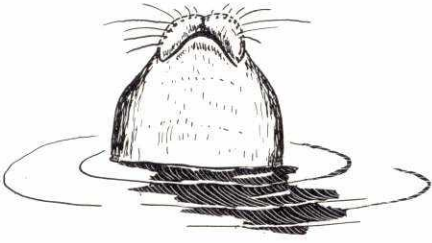
RINGED SEAL

Phoca hispida

ADDITIONAL NAMES. Jar seal, fiord seal. To the arctic trader the new-born young are known as 'whitecoats', the freshly moulted young as 'silver jars', and the immatures and adults 'common jars'. *Phoque annelé*. Eskimo: *Netserk* (*nedjerk*, *natsik*, etc.) in a general sense, *netsiak*—'whitecoat', *netsiavinerk*—'silver jar', *netsilak*—adult of both sexes, *tiggak*—male in rut with strong body odour.

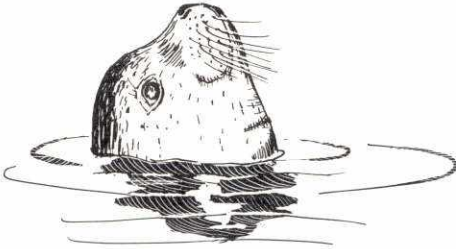
CHARACTERISTICS. The commonest and most widely distributed arctic seal, found wherever there is suitable fast ice for breeding. During the winter the adults and some immatures remain under the ice in bays and fiords by maintaining a number of breathing holes, while most of the younger seals stay at the edge of the fast ice. In the spring the seals come out onto the ice near their breathing holes to bask in the sun and moult their hair coat. They fast at this time, and by 'break-up' the blubber is at its thinnest. Such seals may sink when shot since the thin blubber is less buoyant, and hunting losses may reach as high as fifty percent of the seals killed. Even higher losses are encountered when the surface waters are lessened in density by the fresh melt-water from the sea ice in early summer.

Ringed seals are rarely found on floating pack ice, which is the characteristic habitat of the bearded seal or squareflipper. They are inquisitive animals and Eskimos will lure them nearer their boats by whistling and banging on the bottom boards. When close, the seals will tread water to get a better look, exposing at this time the dark head and silvery chest. When diving, they sink from sight in a vertical position and rarely roll over to expose the back. YOUNG. New-born pups average 26 inches in length and 10 lb. in weight, increasing to 32 inches and 40 lb. by 'break-up' time. They begin to shed the long white foetal coat after 2

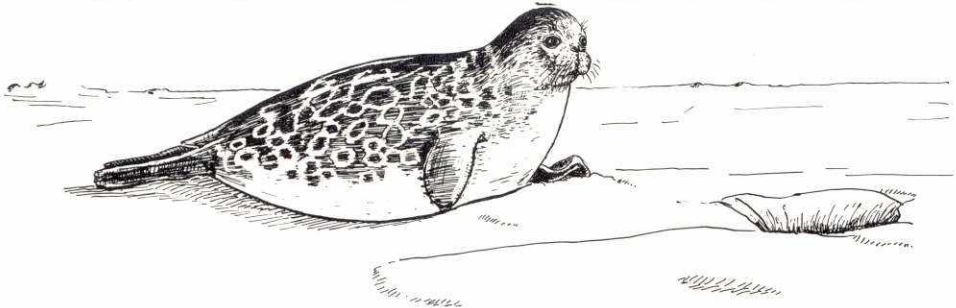


RINGED SEAL

Characteristic attitude when breathing at surface and before sinking from sight



weeks and probably complete the moult within about 6 weeks. In higher latitudes moulting 'whitecoats' may be found as late as the end of June, but this may be the result of later birth dates. The first hair coat has a fine texture. It is of a pronounced silvery hue on the belly and dark grey on the back, which may bear traces of the adult ringed pattern. Such skins are the 'silver jars' of the fur trader, and are generally worth about twice as much as the adult 'common jar' skins. ADULT. The back is dark grey with a pronounced pattern of white rings which may be separate or

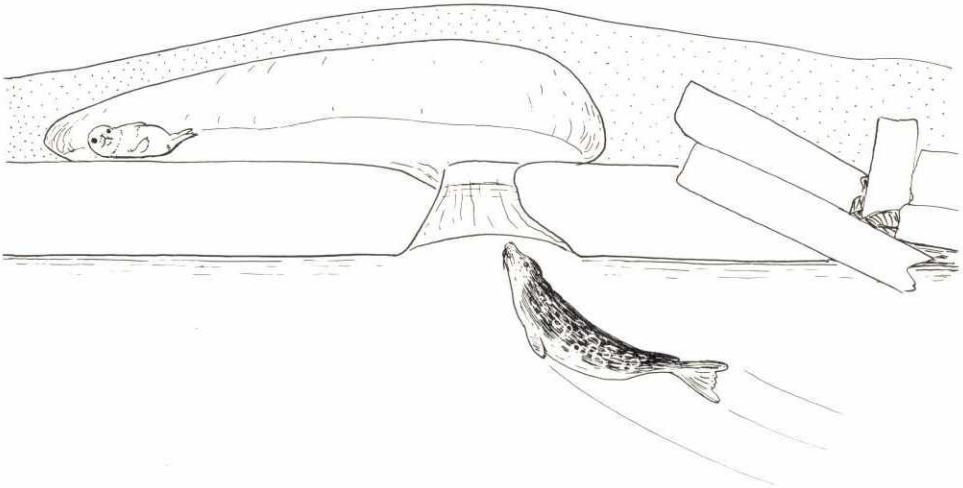


RINGED SEAL

Adult at breathing hole in fast ice

more or less fused together; the belly is silver. Average length 54 inches and weight about 150 lb. in males, the females being slightly smaller. Seals from areas of stable fast ice average heaviest, and a maximum adult size of 65 inches and 250 lb. is probably reached under these conditions.

REPRODUCTION. The young seal is born on the fast ice in a lair (*aglu*)

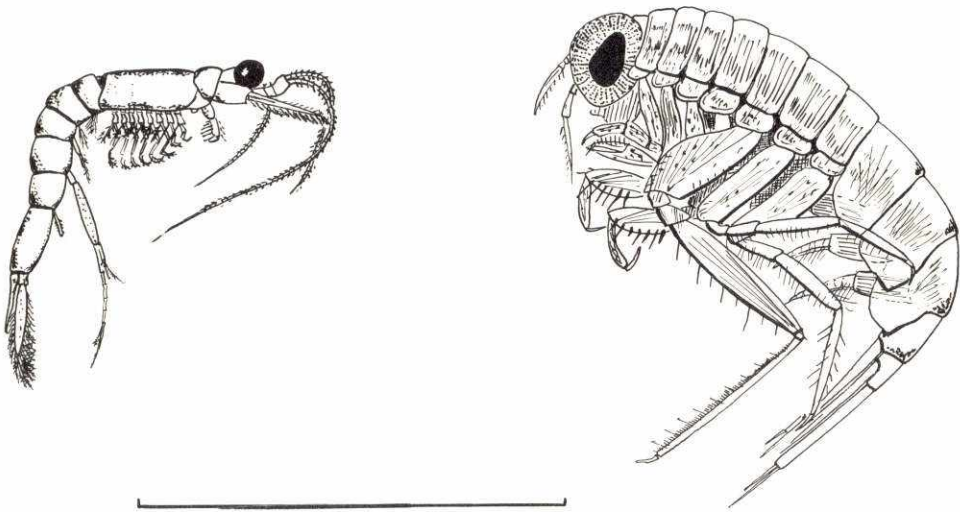


RINGED SEAL

Adult female returning to whitecoat pup in *aglu*

which the female hollows out in the overlying snow, or in a hollow amongst old rafted floes. The majority of pups are born near the beginning of April, or perhaps a few weeks later in more northern latitudes. The females may nurse the pups until the break up of the fast ice, though most are probably weaned before this occurs. The males are in rut from early March until mid May, the peak of mating activity occurring in mid April while the female is still lactating. Both males and females mature when 7 years old, though a few females may become pregnant when 5 or 6 years old.

FEEDING. The most common food organisms are two small shrimp-like crustaceans *Themisto* and *Mysis* and the small polar cod *Boreogadus saida*. The seal may dive to about 50 fathoms in search of *Mysis* and other larger crustaceans and fish, but will usually feed exclusively on the pelagic or free-swimming crustaceans such as *Themisto* when offshore. Thus food does not appear to limit the distribution of the ringed seal.

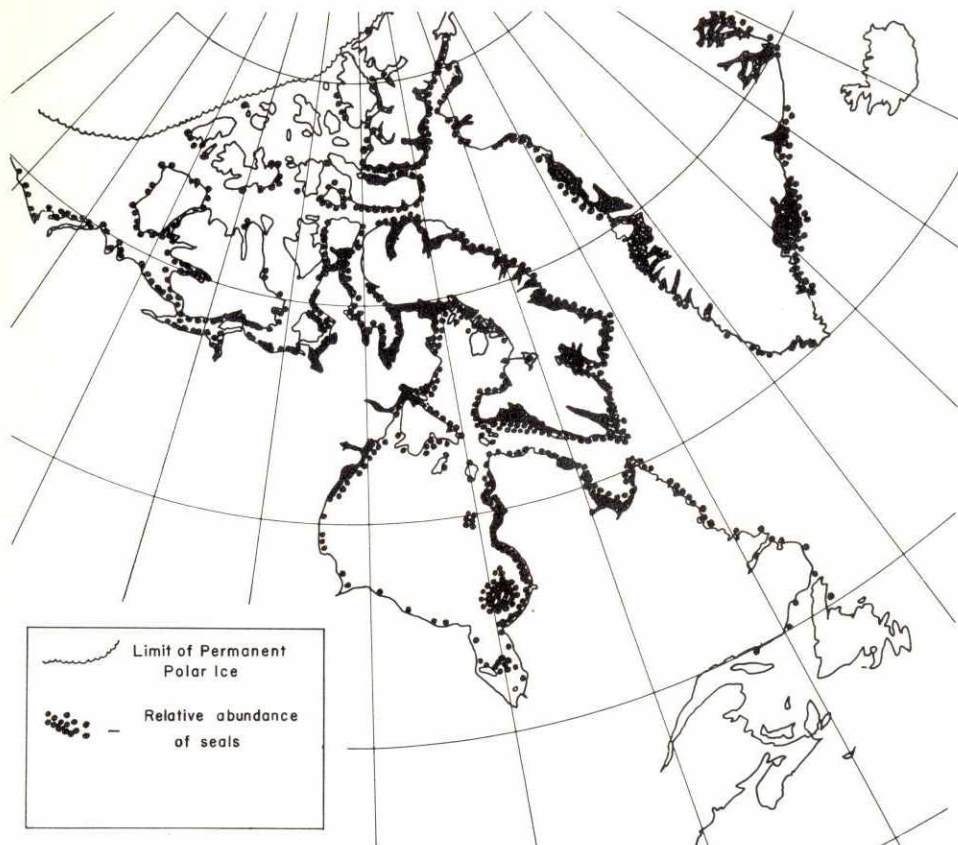


Food organisms of the ringed seal: *left* Mysis, *right* Themisto

DISTRIBUTION. WORLD: a widely ranging seal inhabiting all northern waters where stable fast ice is found during the winter and spring months. **CANADA:** occasionally along the lower north shore of the Gulf of St. Lawrence and in north-eastern Newfoundland. Occurring regularly along the Labrador coast and across the whole of the Canadian arctic to the Bering Sea.

REMARKS. The ringed seal is essentially a marine species, though it is known to frequent Nettilling Lake on Baffin Island, to which it gives its name, and river estuaries along the Ontario coast of Hudson Bay.

It is the most important seal in the Eskimo economy, supplying meat for men and dogs, skins for clothing and boots, and blubber for lamps. Many skins are traded, particularly those of the 'silver jar' which fetch about twice the price of the 'common jar' skins. About 30,000 seals are killed annually in Canada and the skins of perhaps half of these are traded. Catches are made at the breathing holes in winter with harpoons, and occasionally set-guns and hooks. Seals are shot and harpooned at the floe edge or on the fast ice mainly in the spring months, and are hunted from kayak and canoe in the summer. Nets are used infrequently. The habit of pupping on the ice makes the quality and quantity of fast ice most important to the successful breeding of this seal. Good ice most often occurs along complex coast lines containing many bays with numerous islets scattered offshore. Along straight coasts, the ice is often unstable and there is usually only a narrow strip of fast ice. Pups born in such ice risk early separation from the females and may become starvelings. It appears likely that such undernourished young grow



into small adults, which explains much of the difference in size between seals from varying coastal areas. Seals from northern latitudes are considerably larger, probably through the same effect of more stable ice conditions in these areas.

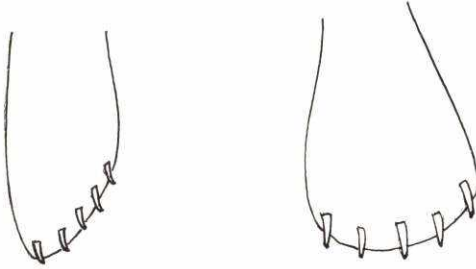
BEARDED SEAL

Erignathus barbatus

ADDITIONAL NAMES. Squareflipper. *Phoque barbu*. Eskimo: *Ugjuk* (*udjuk*, *ugruk*); young—*terreglu*.

CHARACTERISTICS. A large solitary seal found most abundantly in the arctic where shallow banks are free of land-fast ice during the winter. It is usually associated with moving ice on which it hauls out to rest and also to breed in the spring, but in the open water season it may sometimes be taken in river mouths where it hauls out on the sand-bars to rest. In high northern latitudes bearded seals are sometimes trapped by ice movements far from open water and will then maintain breathing holes like the ringed seal, though this habit is not usual. As its name implies, the bearded seal has characteristically long

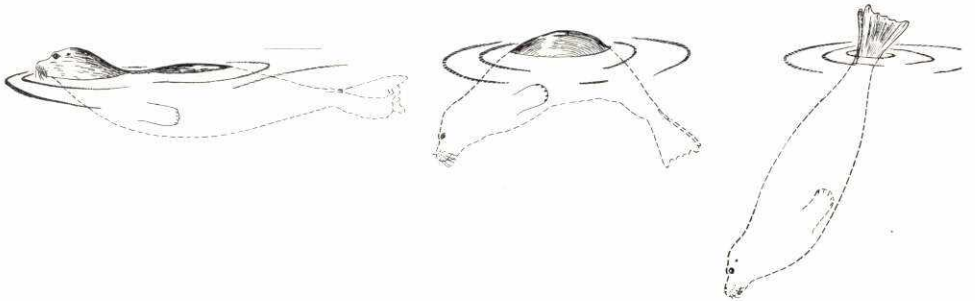
white whiskers or vibrissae which are set in highly innervated muscular pads on the upper lip. They appear to be very sensitive to touch and undoubtedly help the animal to locate and even grasp the bottom living animals which form its chief food. The brow ridges are prominent and the external opening of the ear is large and pigmented and easily seen. The name more frequently used in the arctic is 'squareflipper' and refers to the spade-like foreflipper. The squareflipper has the middle digit longest, whereas in all other seals the digits or



BEARDED SEAL

Foreflipper (right);
foreflipper of ringed or
harbour seal (left)

'fingers' decrease in order from first to last. Another characteristic, not found in any other arctic phocids, is the presence of four mammae, all of which are functional during lactation. In the water the bearded seal can often be recognised from far off by its glistening white whiskers. When swimming at the surface or diving it usually shows its back. In deep dives it rolls forward, exposing the

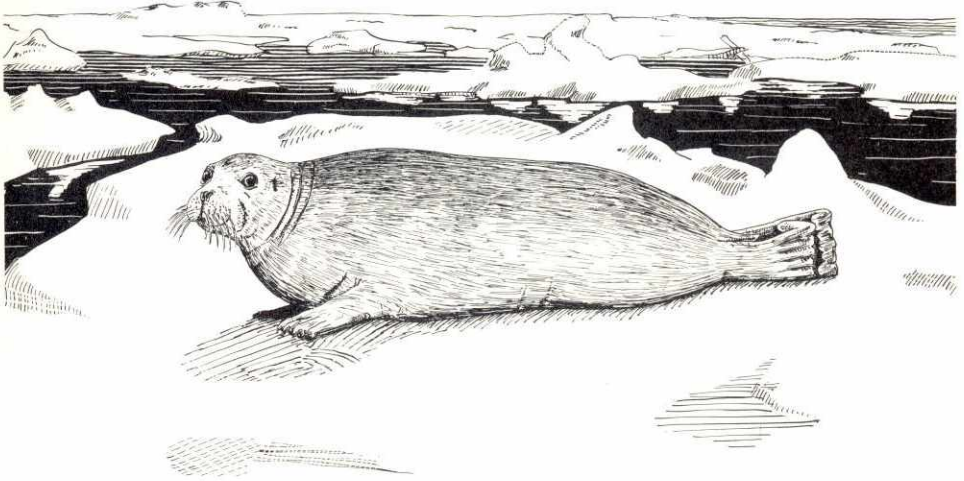


BEARDED SEAL

Swimming and diving positions

back then kicking up the hindflippers. **YOUNG.** The foetal coat is greyish brown with a white muzzle and crown and irregular patches of white on the body and flippers. It is replaced in several weeks by a coat of short stiff silver grey hairs. Average length at birth 48 inches and weight 100 lb., increasing to 60 inches and 200 lb. during the first summer. **ADULT.** Males and females attain

an average maximum length of 75 inches and a weight of 750 lb. The hair coat is dark grey on the back, shading to silver grey on the belly. With increasing age the teeth become greatly worn down until some are eventually extruded from the sockets and replaced by fibrous tissue.

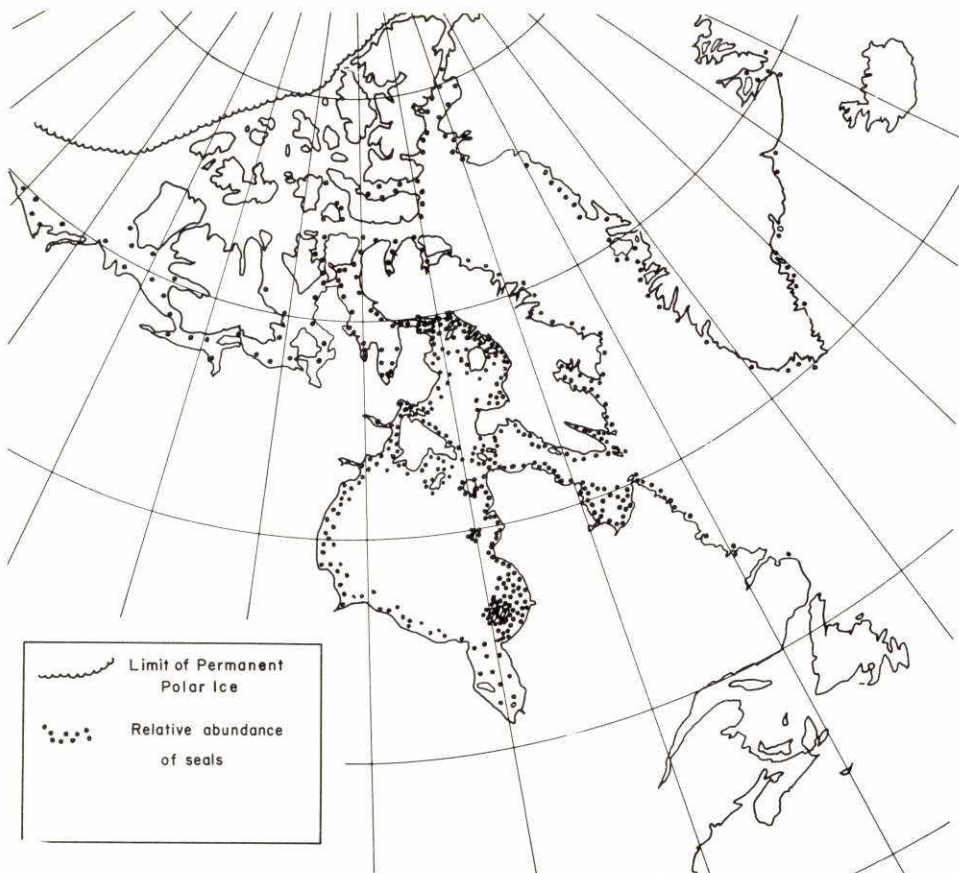


BEARDED SEAL (adult)

REPRODUCTION. The pup is born in April and May, averaging about May 1st in the eastern arctic and somewhat earlier in Newfoundland waters at the southern limit of the animal's range. Males go out of rut in June and are probably most potent in mid May. Females which have already pupped probably do not become ready to mate again until after the season of male sexual activity, thereby missing a pregnancy until the following year. Thus a two year cycle of pup production is established. The male matures at 7 and the female at 6 years of age.

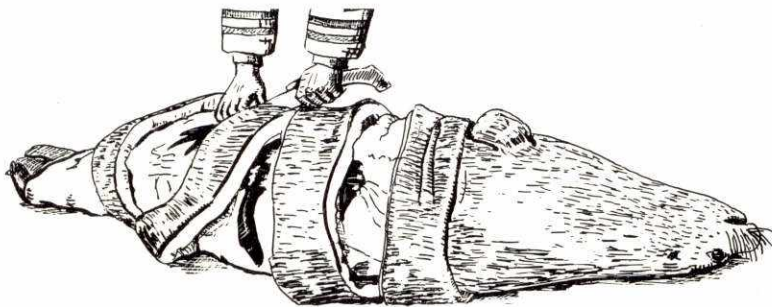
FEEDING. Molluscs such as the whelk *Buccinum* and the cockle *Cardium* form much of the food. Only the muscular feet of the cockles and the bodies of the whelks together with the bony opercular plates which stop up the shell are found in the stomach. How the shells are discarded before the rest is swallowed is still something of a mystery. Other foods include sea cucumbers (Holothuroidea), shrimps, crabs, octopods, worms, fish eggs and the polar cod *Boreogadus saida*. It is doubtful whether the seal dives much below 50 fathoms in search of food and is therefore usually found in shallow water.

DISTRIBUTION. WORLD: sparsely distributed all along the coasts of northern Eurasia, Greenland and North America and the arctic islands to the north. Rare in Europe south of northernmost Norway. Occurs north of Hokkaido (Japan), and in the Okhotsk and Bering Seas. **CANADA:** found in small numbers throughout the Canadian arctic as far north as the limit of the permanent ice.



A few reach as far south as Newfoundland and strays have been found as far as Cape Cod.

REMARKS. The skin of the bearded seal is extremely tough and flexible and is highly prized for making dog-team traces, harpoon lines and the soles of boots. It was formerly much used for covering the large Eskimo boat or *umiak*,



BEARDED SEAL

Preparation of rawhide line. Each ring of skin is slipped off the hind end of the carcass, and after scraping, is cut spirally into line.

but this type of craft has now been abandoned in favour of canoes, whaleboats and trapboats. In a few places in the eastern arctic the skin is still used for covering *kayaks*. The meat is an important source of food for men and dogs, but the liver is not usually eaten by the Eskimos since it may contain vitamin A in amounts large enough to be toxic. Occasional animals are found in which the flesh is infected with *Trichinella spiralis*, the roundworm which causes trichinosis in man (see page 28 under Remarks).

WALRUS

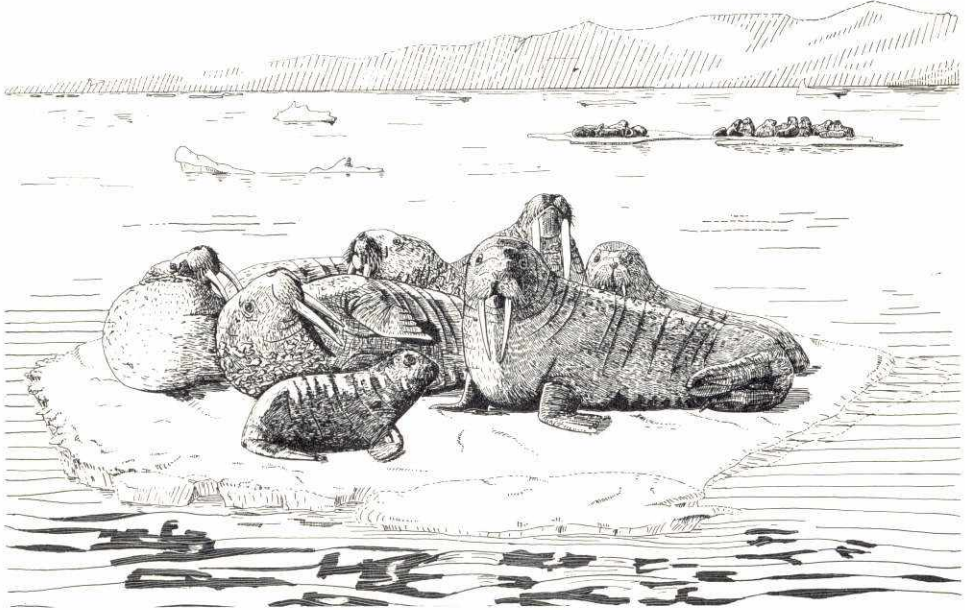
Odobenus rosmarus

ADDITIONAL NAMES. Morse. *Veau marin*. Eskimo: *Aivik*.

CHARACTERISTICS. A highly gregarious pinniped found most abundantly in the arctic where shallow inshore areas are free of land-fast ice during the winter. For most of the year it is associated with the pack ice on which it hauls out to rest and breed. The sexes are usually segregated; the old males keep together, and the adult females form herds with the young and immature animals of both sexes. In all such groups, walrus exhibit marked huddling behaviour, keeping close together in tightly packed 'pods'. Sometimes this is so pronounced that a small ice floe may become partially submerged with the weight of its occupants. During the open water season walrus may congregate on the land in large numbers at certain traditional sites (Eskimo: *uglek*, plural *uglit*) which are used year after year. These sites are usually small rocky islets or promontories which give quick access to deep water. In winter walrus keep to the leads of open water amongst the pack ice and are able to maintain breathing holes in newly formed ice.

The most characteristic features of the walrus are the tusks and whiskers. The tusks are enormously elongated canine teeth and are used for digging up the sea bottom in search of clams and other burrowing organisms which form the principal food. The whiskers, like those of the bearded seal, are quill-like and set in two well developed pads on the upper lip. They are very sensitive and mobile and undoubtedly aid the walrus in locating and grasping food organisms. YOUNG. The foetal coat of fine silver grey hair is shed shortly after birth. The new hair does not begin developing until August and reaches a length of a quarter of an inch at the end of the first year. Both hair coats are very sparse and allow the dark brown-black colour of the skin to predominate. The tusks do not erupt until several months after birth and by the end of the first year have grown an inch in external length. Length at birth 48 inches and weight about 120 lb. Both males and females grow quickly during the first two years of life reaching an average length of 80 inches and a weight of 750 lb. ADULT. *Female*. Maximum average length 102 inches and weight 1,250 lb. (maximum recorded 1,600 lb.). The female is smaller than the male and can be recognised by her smaller head and narrower tusks. The tusks become almost as long as those of the males in a few individuals, but their slender structure usually results in more rapid wear and a sharply pointed

profile. *Male*. Maximum average length 120 inches and weight about 2,000 lb. (maximum recorded 2,800 lb.). The thick powerful tusks and broad muzzle at once distinguish the adult male, and these characteristics are most pronounced in old age. At sexual maturity the neck, chest and shoulders become covered with large fibrous tubercles up to 3 inches across and 2 inches thick. This lumpy skin



WALRUS

Centre front—calf several months old

Right front—adult female

Right rear—two-year-old immature; remaining animals are all adult males

and the powerful neck muscles give the male an unmistakable depth in outline. The whiskers become worn with advancing age from the constant friction involved in feeding.

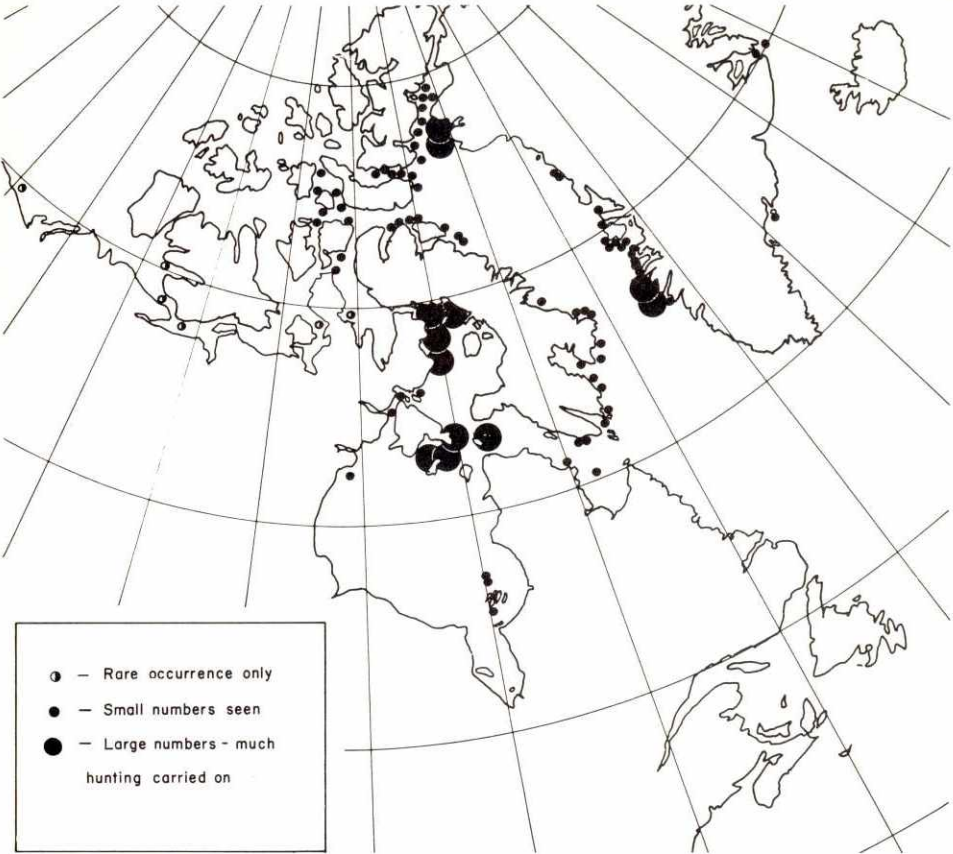
REPRODUCTION. The period of birth extends over two months with a peak about mid May. The calf is suckled by the female for about two years and is closely protected by her during this time. When danger threatens the calf will often cling to its mother's neck and be carried away to safety. Such strong ties between mother and young have great survival value to an animal whose reproductive rate is so low.

Males mature when 6 years old and appear to be sexually active throughout life. Females may be ready to mate when 4 years old, though many do not do so until several years later. The time of mating is uncertain but appears to be in early spring. Small embryos are first found in May, which indicates that there might be a delay in implantation of the embryo, as in other pinnipeds (see page 2).

The reproductive cycle is basically biennial but missed pregnancies, particularly in older females, result in births occurring more nearly once in every three years.

FEEDING. The diet consists principally of clams which are dug up by means of the tusks. Generally only the siphons or feet of the clams are eaten and shell fragments are rarely found in the stomach. It would appear that the walrus is able to crush the shells in its mouth and then spit out all the unwanted parts. Where clams are not found, the walrus will eat a variety of other bottom-living forms such as whelks (*Buccinum*), sea cucumbers (Holothuroidea), shrimps (Hippolytidae and Crangonidae), hermit crabs (Eupaguridae), and a variety of worms. Occasionally males are taken with pieces of skin and blubber from other marine mammals, particularly the ringed seal, in the stomach. This food may be carrion, but there is evidence to suggest that live seals are sometimes attacked and eaten.

DISTRIBUTION. WORLD: circumpolar, rarely straying further south than the spring limit of pack ice. There are three geographically isolated groups inhabiting



(a) the east Greenland coast, Spitsbergen, Franz Josef Land and the Barents and Kara Seas, (b) the Bering and Chukchi Seas, and (c) the eastern Canadian arctic

and western Greenland. There is also the possibility that the herds frequenting the Laptev Sea, north of Siberia, form a fourth distinct group. CANADA: from the northern tip of Labrador to Hudson Bay and Foxe Basin in the west, and Smith, Jones and Lancaster Sounds in the north. Rarely seen west of Boothia Peninsula. Lone animals from the Bering and Chukchi Sea herds may occasionally stray to the Canadian arctic coast eastwards from Herschel Island to Banks and Victoria Islands, but these are comparatively rare and are of little importance to the native economy.

REMARKS. In recent historic times walrus were abundant and widespread; large breeding herds occurred as far south as Sable Island, off the coast of Nova Scotia, and at the Magdalen Islands in the Gulf of St. Lawrence. They were exterminated from these two places by the end of the 18th century, and then the pursuit extended into more northerly waters, following the hunting of the large Greenland right whale or bowhead. With the introduction of the rifle into the Eskimo economy, and the increased demand for ivory and skins from the trading posts, the walrus herds suffered a serious decline in most areas. Only the resident and comparatively isolated populations of Foxe Basin and the northernmost part of Baffin Bay were saved from over-exploitation.

In 1931 a Department of Fisheries Act was passed which prohibited the export of unworked ivory and skins from the arctic, and limited the taking of walrus to Eskimos and certain white residents. This Act was amended in 1949 by a set of more explicit regulations which appear to have prevented over-utilisation in most areas, though bad hunting techniques in a few localities may have offset the advantages gained. The average annual kill of walrus in the Canadian arctic in the last 10 years has been about 1,200, but to this must be added another 400 to account for the estimated losses by sinking.

The walrus is of great importance to the Eskimo economy, providing meat for men and dogs, and blubber for lamps. Nowadays little use is made of the skin and it is mostly fed to the dogs together with the meat and blubber.

Occasionally males are taken which are infected by *Trichinella spiralis*, the roundworm which causes trichinosis in man. The origin of this parasite is uncertain, but it probably comes from infected seals which are sometimes eaten. It is well known that the polar bear, which lives almost exclusively on seals, is usually heavily infected with this same parasite. Uncooked flesh from infected walrus can therefore be dangerous to man and death may result if the degree of infection is heavy. The liver of seal-eating walrus is also dangerous to man since, like that of the polar bear, it may contain a toxic amount of vitamin A.

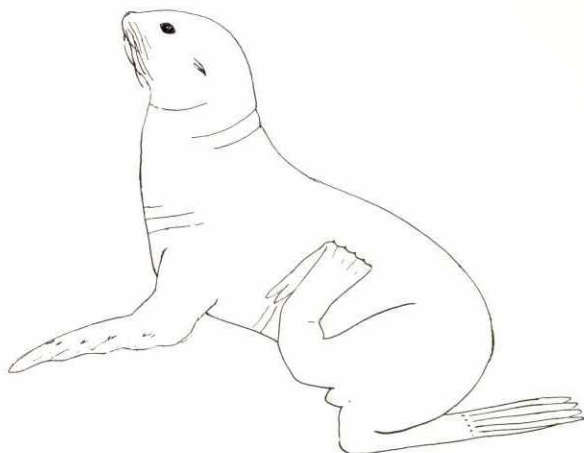
NORTHERN FUR SEAL

Callorhinus ursinus

This otariid seal is included here since three strays have been taken in the western and central arctic in recent years. All appear to have been immature seals.

ADDITIONAL NAMES. Alaska fur seal. *Phoque à fourrure du Nord*.

CHARACTERISTICS. An eared seal with fore limbs forming well developed swimming paddles and hind limbs which are turned forward when moving on land. Unlike the true seals, which have a sparse hair coat, the fur seal has a thick coat of dense underfur protected by a longer coat of stouter guard hairs. The adult male reaches a length of 7 ft. and a weight of 600 lb.; the



NORTHERN FUR SEAL (immature)

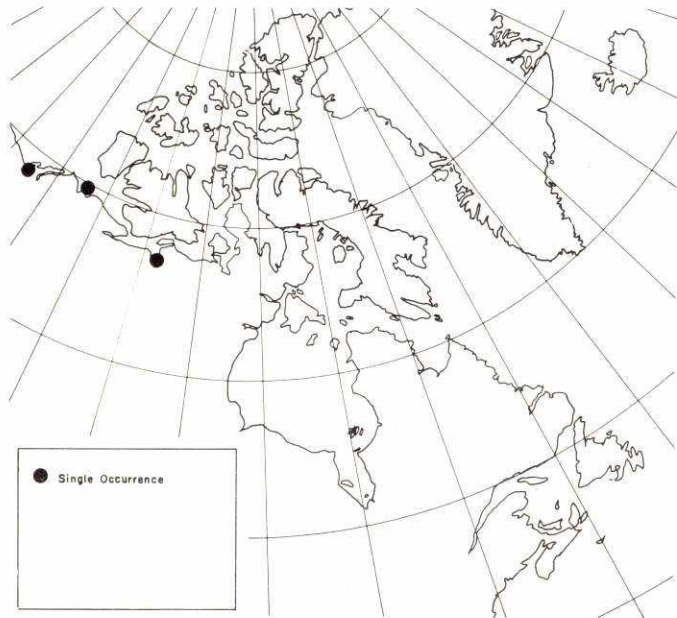
adult female 5 ft. and 130 lb. The pup at birth weighs 12 lb. Its fur is shiny black, but during the summer this first coat is shed and replaced by a **grey** pelage similar to that of the older animals, though brighter.

REPRODUCTION. The young are born on 'rookeries' between mid June and mid August. Each year the same breeding grounds are reoccupied.

FEEDING. Primarily a deep water feeder on squid and small schooling fish, especially lantern fishes (Myctophidae). Inshore at certain places the fur seal feeds on herring, capelin, salmon, cod and walleye pollock.

DISTRIBUTION. Breeds on the Pribilof and Commander Islands in the Bering Sea, and on Robben Island and the Kurile Islands in the Sea of Okhotsk. The main part of the Pribilof herds migrates south in winter to the waters off western Canada and the United States, while the remainder migrates to Asiatic waters, chiefly off northern Japan.

REMARKS. This is the most valuable seal of the fur trade. Land killing is limited to annual quotas controlled by the United States government at the Pribilof Islands, and by the government of the USSR at Robben Island and the Commander Islands. Pelagic sealing is now forbidden under the terms of the



Interim Convention on Conservation of the North Pacific Fur Seal signed by the USA, USSR, Japan and Canada in 1957, but to compensate for their losses, Japan and Canada are paid an annual fixed percentage of the total land killings made by the USA and USSR. The Convention has sponsored a broad program of research which includes the marking of many thousands of young animals. Any fur seals taken in the Canadian arctic should be checked for flipper tags and reported to the R.C.M.P. or directly to this office.

ACKNOWLEDGMENTS

Most of the facts recorded in this bulletin are taken from published and unpublished works of members of the staff of the Arctic Unit, and the author is indebted to his colleagues Drs. H. D. Fisher, I. A. McLaren and D. E. Sergeant for permission to use their work and for their help in criticising and correcting the manuscript.