PRELIMINARY REPORT ON THE ABORIGINAL TAKE OF 41 FEMALE FUR SEALS FROM THE SITKA AREA, ALASKA, 24 MARCH - 1 APRIL, 1950.

Karl W. Kenyon and Victor B. Scheffer
Biologists, Division of Wildlife Research
Seattle, Washington

29 May 1950

DEPARTMENT OF THE INTERIOR
RECEIVED
OCT 23 1950
FISH AND WILDLIFE SERVICE
Merged With
A.R.L.I.S.
Library
U.S. Fish & Wildlife Service
ANCHORAGE, ALASKA
Est. 1997
1011 E. Tudor Road

Frontispiece

Tlingit sealer, Herman Kitka, while hunting seals in West Crawfish Inlet, near Sitka, Alaska.

Photo 463 KWK, Sitka, 24 March 1950

TABLE OF CONTENTS

PRELIMINARY REPORT ON THE ABORIGINAL TAKE OF 41 FEMALE FUR SEALS FROM THE SITKA AREA, ALASKA, 24 MARCH - 1 APRIL, 1950

Karl W. Kenyon and Victor B. Scheffer,
Biologists, Division of Wildlife Research,
Seattle, Washington

29 May 1950

Purpose.--In order to gather needed information on the feeding habits and conditions of the reproductive tracts of fur seals we took advantage, in 1949, of the pelagic sealing operations customarily carried on during the spring by the native sealers of the Sitka region. The purpose of my stay in that area between March 11 and April 11 of 1950 was to purchase from the natives the carcasses of fur seals as well as to collect pelt samples. The carcasses would furnish us material for the study of the seals' local feeding habits and the percentage of pregnancy among females. In addition we planned a study of the teeth as an index to age and a study of the characteristics of the unborn pups at this period.

Reduction of sealing activities in recent years.--After my arrival at Sitka I located the natives who, during recent years, have been the most active and successful sealers. These men told me that no sealing was planned for the 1950 season because of the restrictions presently applying to aboriginal sealing operations. The condition of their equipment was not such that sealing could be conducted under the existing restrictions. They felt that the expense involved in properly fitting themselves out for sealing would not be justified by their take of seals.

The restriction most discouraging to the sealers was that no sealing could be done inside the three mile limit. They were also discouraged because they would not be allowed to use their power craft as a means of establishing their base sealing camps. The base sealing camps are customarily established more than 20 miles from Sitka and the route they must take between Sitka and the camp consists predominantly of open water. The risks involved in using presently available, inadequate equipment made sealing dangerous and impractical.

Through the Washington and Juneau offices we were informed that the three mile limit restriction then applying had been imposed through a misinterpretation of the law governing aboriginal sealing. We were also informed that because of the precedence of many years the sealers would be permitted to establish their base camp through the use of their power boats. Aboriginal sealing could then be conducted by the natives from their base camp using primitive methods. Prompt cooperation by the Regional Director at Juneau and of the local enforcement agent at Sitka were the decisive factors which made it possible for our mission to be at least partly successful.

Historical aspects of aboriginal sealing near Sitka, 1936-1950.-- The following summary of the seal catch in the Sitka area (Table 1) indicates that seals were taken in April and May only in several seasons. While a few seals may be taken in these months, we believe it probable that in the years these later dates only are indicated a number of the seals were taken previous to the dates shown. Since they were probably enthenticated in the late spring or early summer the memory of the sealers may have lapsed somewhat and the earlier dates omitted.

In several seasons disproportionately large numbers of males appear in the record (notably 1948). In 1950 a total of 41 seals were taken in the Sitka area. All of these animals were females and the natives say that it is unusual to get a male. Thus certain years, which show a high percentage of males in the take, are probably the result of faulty methods of sex determination. I detected a lack of knowledge regarding sex determination on the part of several individuals concerned with seals.

TABLE 1.--Summary of fur seals taken in the Sitka area, 1936-1950

Year	Month	Total seals taken	M	F
1936	April	11	4	7
1937	February-May	116	19	97
1938	April-May	92	2	90
1939	April-May	31	1	30
1940	April-May	36	12	24
1941*				
1942*				
1943*				
1944	Not available	16	1	15
1945	Not available	39	30	9
1946	Not available	355	22	333
1947	March	25	1	24
1948	February-March	202	173	29
1949*				
1950	March-April	41	0	41

*No record available indicating that seals were taken in these years.

Under the restrictive conditions that have prevailed in recent years the native attitude toward sealing has lacked enthusiasm. Now that the conditions specified under the 1942 provisional agreement with Canada and the act of February 26, 1944 have been clarified it is possible that more interest will be shown toward sealing by the Sitka Indians.

The number of Indians in this area that are interested in sealing is small for several reasons. Primary among these is the fact that a livelihood at present may be more easily made by other means. The men interested in sealing are the professional fishermen who own boats large enough to transport their equipment to the sealing camps. If other work was available to these men during the closed season on fishing the number interested in sealing would probably be even smaller than now. Employers in the Sitka region avoid hiring fishermen on jobs about town because they know all fishermen will leave as soon as the fishing season starts. The fishermen find it difficult to make sufficient money during the short summer fishing season to carry them through the entire year and with other employment witheld from them they are glad of the opportunity to augment their living by taking a few seals.

Use of seals by the Indians.--The primary reason the natives take fur seals is to sell the skins. A local merchant at Sitka informed me that he was willing to buy up to 100 skins from the Indians at $12 each. Secondarily the meat is used for food. I joined the Indians in many meals of seal meat while at the sealing camp and found it very palatable. We brought a number of carcasses back to Sitka for distribution to friends and relatives of the sealers.

Aboriginal sealing, 1950.--Mr. Herman Kitka, a Tlingit fisherman and sealer, agreed to take me with him on his sealing expeditions. We left Sitka aboard his boat on March 23 and established our base camp near West Crawfish Inlet, about 25 miles south-east of Sitka. Seals were numerous in the inlet; I estimated that approximately 2,000 were in the area when we first arrived. The Indians were able to take 22

seals during the following two days. After returning to Sitka on the 26th sealing was continued from the 27th through 1 April. During this period 19 more seals were killed but the abundance of seals in West Crawfish Inlet had dwindled rapidly during the last week of March. On 1 April only a few dozen seals were in the inlet and the men worked hard, rowing well out to sea, but were able to take only two seals. On 31 March we had explored nearby Crawfish Inlet where the seals also enter inland waters but we found conditions there almost the same as in West Crawfish, with very few seals in the area. According to the Indians seals usually become scarce in the inlets around the first of April. My thought at the time was that perhaps the presence of the sealers had frightened the animals out to sea. However, on April 4 and 8 I returned to West Crawfish Inlet in company with Enforcement Agent Gomer Hilsinger aboard the Pelican. Although no sealing had been done in the area since 1 April we saw respectively three and six seals on our two trips.

Records of previous seasons indicate that seals are taken during April and May in the Sitka region. The natives informed me that most of the seals taken during these months are taken at sea, since few if any are to be found in the inlets during this period. In 1950 seals were observed in Crawfish Inlet by the middle of January and remained there in considerable numbers until near the end of March. Thus if we plan to collect additional material from the Sitka region it would be wise to have a biologist at Sitka by the middle of February.

Methods of sealing.--I accompanied the Indians in their small sealing boat during one day of sealing. At other times I remained behind to take care of my specimens and equipment. The natives used small, three

Fig. 1.--The sheltered bay near West Crawfish Inlet where the Tlingit sealers made their base camp. The small three man row boat in the foreground is the type from which seals are speared.

Photo 481 KWK, Sitka, 20 March 1950

man, round bottom row boats (see fig. 1). They carried a small sail which was raised when favorable winds were encountered.

Ideally, for sealing, the weather should be quite calm but with a light breeze, say three to five knots, enough air movement to put a slight ripple on the water, but not enough to raise a chop. If the water is glassy the seals are quite easily aroused. On the other hand, if there is a chop on the surface it is difficult to hurl the spear accurately. Under intermediate conditions the sealers are able to approach a resting seal as closely as six to ten feet, making capture certain. When a sleeping seal is sighted at a distance the boat is maneuvered into position to make the final approach of 50 yards down wind. The down wind approach is made for two reasons. First the breeze aids the speed and silence of the approach. In glassy calm water the sound of the oars will often alarm the seal. Second the lapping of water on the boat makes less sound when it moves down wind, going with the ripple or chop, rather than against it. Apparently seals are unable to detect the sealers proximity by scent.

To take the seals the natives use a spear head having three double barbs made from soft iron stock about 1/8 inch thickness (see fig. 2). This is fitted into the notched end of a spruce pole which is between ten and fifteen feet in length. A line is attached to the spear head and is fastened lightly to the shaft, so that when a seal is struck the spear head and line are detached from the shaft which floats and is recovered after the seal is dispatched. The seal must be asleep or resting if the sealers are to approach within the hurling range of their spear, which is approximately 20 to 30 feet. At distances greater than 25 feet

(fig. 3)

Fig. 2.--Bill Morrison, a Tlingit fisherman and sealer, demonstrates how the barbed iron spear tip fits into the notched shaft which is hurled at a resting seal.

Photo 484 KWK, Sitka, 8 April 1950

the accuracy of the spearhurler falls off rapidly. No attempt is made to throw the spear through the air the entire distance to the seal. Rather, the technique is to hurl the spear with a flat trajectory, so that it strikes the water horizontally several feet short of the seal, then skims along the surface, to pierce the animal at the water line.

When struck the seal indulges in numerous frantic jumps and dives. In its frenzy it fails to make a consistant effort to escape, diving and beating the water with its flippers so erratically that it is easily held by one man. During these struggles the seal sometimes empties its stomach, leaving a cloud of partially digested fish and scales in the water. After the animal has been pulled in until 10 to 15 feet of line still remain between it and the sealer, it begins an attack on the boat. Making frequent dives the seal comes up under or beside the boat and the sounds of teeth ripping splinters from the sides and bottom are quite alarming. On several occasions the seal's head appeared above the gunwal which it grasped in its teeth, ripping away a mass of splinters before it either dived again or was clubbed.

When the seal is close to the boat and is quite tired by its efforts to escape it is easily killed with a short club and hauled aboard (fig. 4). The entire process from spearing to clubbing takes between five and ten minutes.

One of the sealers, with whom I did not go out, circumvented the attack on the boat by drowning the seal before it was brought alongside. For this purpose he used a 30 pound lead ball on a small block. This was kept in the boat until after the seal was speared then allowed to slide down the line toward the seal. Each time the seal dived the ball

Fig. 3.--Tlingit sealer, Cyrus Williams, at the moment he hurls his spear at a fur seal. The animal took alarm at the instant the spear was thrown. However, the spear struck before the seal could escape.

Photo 461 KWK, Sitka, 24 March 1950

Fig. 4.--Speared fur seal about to be clubbed after becoming exhausted by its struggle to escape.

Photo 466 KWK, Sitka, 24 March 1950

came closer, finally resting near its body and holding it under, as it tired, until it drowned.

Field care of specimens.--When the Indians brought in a load of seals they had killed, I first weighed and measured each specimen entire. After the animals had been skinned the stomachs and reproductive tracts and snout were removed. The genital tracts and stomachs were pickled in a 10% commercial formalin solution immediately and the snouts saved unpickled for removal of the teeth in Seattle. All fetuses, with the exception of seven were pickled along with the stomachs and reproductive tracts. The pickled reproductive tracts have been sent to Dr. Robert K. Enders at Swarthmore College for study. From the seven fetuses not pickled the skin and skull were removed. The skins were salted for tanning later and the skulls frozen to be cleaned in Seattle.

Collection of sample adult pelts.--In order to shoot the four seals which I was authorized to kill for pelt studies I would have had to impose on the natives. Thus I bought two representative skins from them at the regular market price of $12. Since the sealing expeditions were carried out at the Indians' expense I felt that had I shot seals I would have been taking advantage of the hospitality and cooperation they had extended to me. In other words I would have been cutting into their operations by taking seals that they might otherwise have had. The seals had left before I had an opportunity to take them from the Fish and Wildlife boat Pelican. The two pelts of adult female seals and the skins from the seven fetuses are now being tanned by the S. Johnson Fur Company in Seattle. All of the animals taken appeared, in the field, silver-gray in color.

Fig. 5.--Speared fur seal after being clubbed and hauled aboard. Although the spear struck a glancing blow, becoming lodged under a narrow strip of skin, it held securely. The seal lost no blood from the wound.

Photo 460 KWK, Sitka, 24 March 1950.

Stomach analyses.--Insufficient time was available between my return from Sitka and my departure for the Pribilofs to make stomach analyses of the Sitka taken seals. Preliminary indications are that the stomachs contain a high percentage of herring. The stomachs are being held in Seattle.

The fur seal fetus in late March.--We have as yet had an opportunity to make only a superficial study of the 31 fetuses taken from the gravid cows during the latter part of March at Sitka.

General appearance of fetus.--The fetuses were well formed (fig. 6), the eyes were open but the teeth had not yet erupted from the gums. The white skin was thinly covered with a light brownish to gray fuzz measuring 1 to 3 mm. in length. The black natal hair, which covers the seal pup at birth was evident to a variable degree, around the face, along the top of the head and along the median dorsal line. Interspersed in this black natal hair, especially on the back of the head of the more highly developed fetuses, are numerous white tipped hairs about 5 mm. long.

Of the 31 fetuses taken, 16 are males and 15 females. The smallest and largest, both males, weighed respectively 2.5 and 5 pounds. The averaged weight of the males was 3.91 pounds and that of the females 3.31 pounds, in other words the males average nearly 20% heavier than the females at this stage. A similar analysis of the lengths indicate that the males are nearly 5% longer at this stage.

The following tablulation indicates that the largest cows have the largest pups.

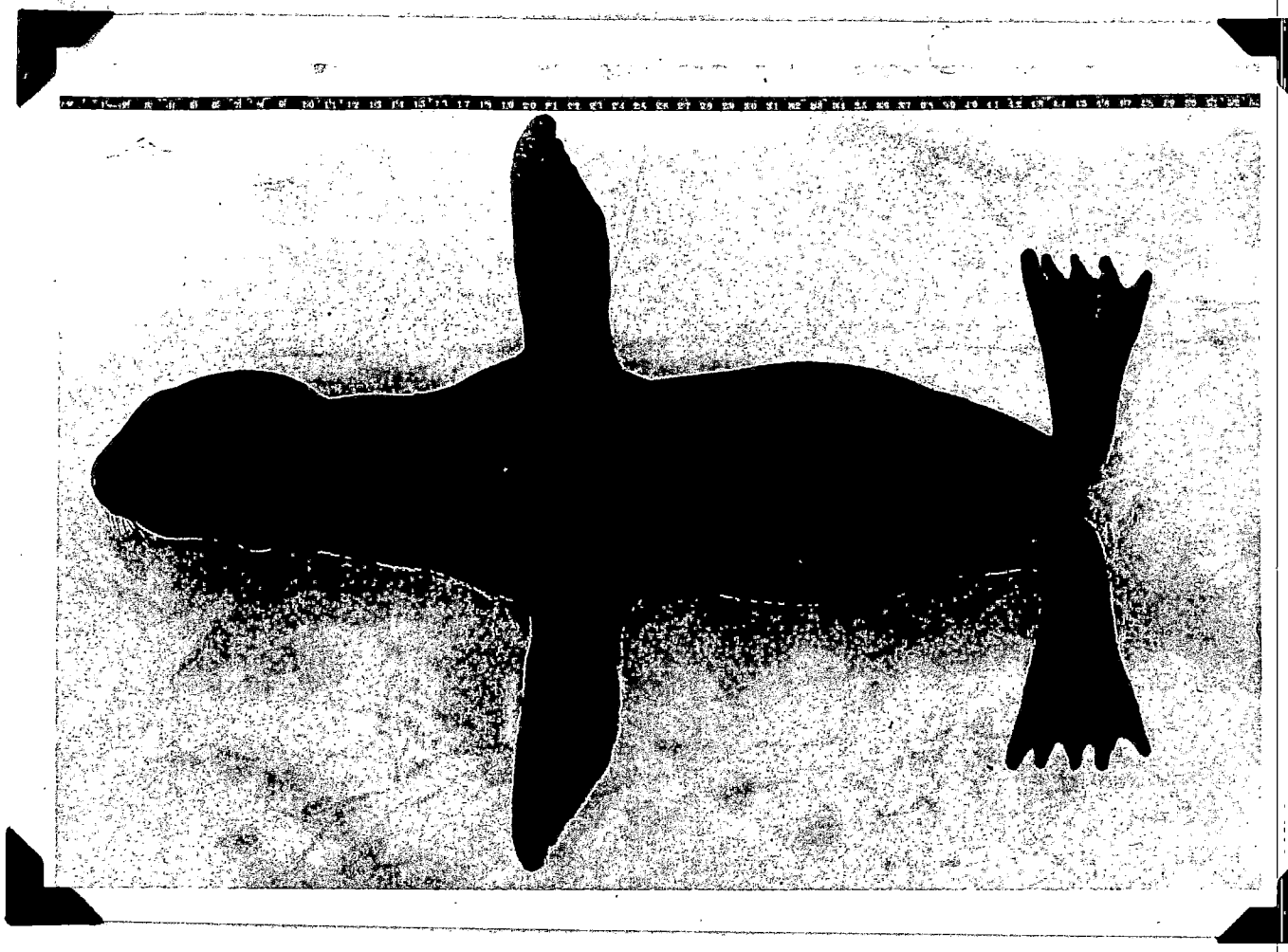

Fig. 6.--Fur seal fetus taken from cow seal, West Crawfish Inlet, March 28, 1950. Black natal hair is evident on the head and to a lesser degree along the median dorsal line. The body is sparsely covered with light fuzz. The fetus taken, during the latter part of March, varied from 2.5 to 5 pounds in weight.

Photo 473 KWK, Sitka, 28 March 1950

Pup wts. to nearest lb.	No. of pups in class	Average wts. of mothers to nearest pound
2.5	1	79
3.0	9	92
3.5	9	94
4.0	8	97
4.5-5	4	118

A similar study of fetus and cow lengths indicates a similar trend.

TABLE 2.--Fetuses taken grouped as to sex and arranged according to weight and length

	Males				Females		
	Wt. lbs.	Length, mm.	Col. no.		Wt. lbs.	Length, mm.	Col. no.
	2.5	335	13		3.	360	8
					3.	382	3
	3.	400	39		3.	390	17
					3.	392	5
	3.5	387	19		3.	414	40
	3.5	391	2				
	3.5	419	12		3.2	391	27
					3.2	395	28
	4.	417	36				
	4.	414	7		3.3	405	24
	4.	420	30				
	4.	423	34		3.5	391	20
	4.	435	6		3.5	392	11
	4.	466	25		3.5	399	26
					3.5	409	23
	4.2	432	9		3.5	421	31
					3.5	422	37
	4.5	421	15				
	4.5	434	10		4.	432	29
	4.5	439	18	Aver.	3.31	399.6	
	5.	472	41				
Aver.	3.91	419.6					

Study of the 41 Cows Taken near Sitka in 1950

Length distributions.--The field lengths of the 41 cows taken near Sitka fall into a pattern resembling a normal distribution (Table 3).

For a more complete discussion of this matter see pages 9, 10, and 11 of our 17 February 1950 report.

TABLE 3.--Kill of 41 female fur seals, taken near Sitka, Alaska, March 24-April 1, 1950.

Distribution of length classes 1/

Length, class interval 1 in.	Number of seals
42	1
43	0
44	0
45	0
46	3
47	1
48	2
49	7
50	9
51	7
52	2
53	3
54	3
55	2
56	1

1/ Snout to tip of tail flesh, measured to nearest inch. (If these measurements are compared to those in our 17 February 1950 report a correction factor of about 1.5 inches should be subtracted from the Sitka measurements, since the 100 cows taken on St. Paul Island were measured to base of tail.)

Weight distribution of the 41 female fur seals taken near Sitka.--The seals taken at Sitka, although a small sample, show that age and weight are not strictly correlated. In general Table 4 shows that seals increase in weight even after the age of 10 years. However, seals whose ages were determined by a study of tooth ridges, demonstrate that weight is not a good criterion of age for individual animals. One seal aged 10 years weighed 54 pounds while others in the same age class ranged up

to 112 pounds, a difference of 51%. Thus just because a seal is small it is not necessarily young. On the other hand the seals in the 10+ age group were definitely the largest animals taken. Two in this latter class weighed approximately 130 pounds.

TABLE 4.--Average weights by age class

Age class	Number in class	Average weight	Extremes
5	1	51	51
6	2	80	79-82
7	2	84	82-87
8	3	86	79-98
9	4	91	85-100
10	5	95 1/	54-112
10+	23	103	83-130

1/ The abnormally small cow weighing 54 pounds was omitted. If she is included this figure becomes 86 pounds.

Hypothetical considerations.--The data which we now have, relative to the breeding habits of the female fur seal, are not sufficient to permit us to generalize or to draw conclusions. However, the existence of certain conditions is indicated. The following discussion of our data and tentative hypotheses is included to point the direction of future studies along this line.

Pregnancy of Sitka taken seals.--We believe that the 41 seals taken at Sitka are a representative sample of the animals in that area between March 24 and April 1. The Indians took every seal they were able to spear, making no selection whatever, according to their statements. Although the sample is small we believe that, because of the non-selective method of sealing, certain inferences may be drawn from this collection. Although the conclusions reached are tentative they will be helpful

in evaluating future data of a similar nature. The important overall indication is that our previous assumption is correct that 20% or more female Pribilof seals fail to become pregnant annually. Of the 41 cows taken 10, or 24%, were not pregnant. Of this number one animal, a five-year-old (no. 32) appeared to be a virgin and another had recently lost her pup. On superficial examination in the field the remaining eight appeared to be otherwise normal but non-pregnant adults. Thus the non-pregnant portion of the take is somewhat higher than the 18% we found in the October 1949 Pribilof Island sample of 100 cows.

TABLE 5.--Kill of 41 female fur seals, Sitka, Alaska, March 24-April 1, 1950: Annotated list of specimens 1/

Est. age, years	Length, mm.	Length, inches	Wt., lbs.	Spec. no.	Pregnant	Not pregnant
5	1069	42	51	32		x
6	1185	46.5	82	23	x	
	1265	50	79	13	x	
7	1285	50.5	82	30	x	
	1295	51	87	26	x	
8	1220	48	79	3	x	
	1260	49.5	81	39	x	
	1272	50	98	15	x	
9	1271	50	89	20	x	
	1276	50.25	85	27	x	
	1172	46	91	19	x	
	1296	51	100	5	x	

1/ Arranged according to age (estimated), field length and specimen number. Age estimations are based on examination of the right upper canine tooth. Length is measured from snout to tip of tail flesh, animal resting on its back.

Est. age, years	Length, mm.	Length, inches	Wt., lbs.	Spec. no.	Pregnant	Not pregnant
10	1165	46	54	35		x
	1215	47.75	82	1		x
	1254	49.25	81	16		x
	1279	50.25	92	40	x	
	1300	51	112	9	x	
	1370	54	106	31	x	
10+	1205	47.5	83	36	x	
- 2/	1240	49	99	14		x
10+	1250	49.25	85	29	x	
	1255	49.5	94	24	x	
	1260	49.5	107	11	x	
10+	1259	49.5	115	33		x
	1275	50.25	102	34	x	
	1286	50.5	92	21		x
	1282	50.5	101	28	x	
	1296	51	92	2	x	
10+	1292	51	96	17	x	
	1293	51	101	12	x	
	1310	51.5	115	10	x	
	1315	51.75	93	37	x	
	1334	53.5	130	41	x	
10+	1339	52.75	101	8	x	
	1340	52.75	104	4		x
	1361	53.5	105	6	x	
	1371	54	106	25	x	
	1384	54.5	95	38		x
10+	1394	55	105	7	x	
	1396	55	115	22		x
	1430	56.25	130	18	x	

2/ The teeth of this seal were lost. However, because of her appearance and long white whiskers, she is ranked as a fully adult cow and placed for our purposes in this group.

Age groups represented in our two cow samples.--Dr. Scheffer was able to determine the estimated ages of the Sitka collection of seals before leaving for the Pribilofs. Thus the ages as here presented are comparable with those presented in our report of the 100 cow kill, dated 17 February 1950. For an explanation of Dr. Scheffer's method of age

determinations see the above mentioned report, page 7.

In our previous report of the 100 cow kill (page 7) we mentioned the surprising scarcity of young cows 1-6 years old in the sample. The dearth of cows in this age group among the 41 taken at Sitka was even more striking. This may perhaps be taken as an indication that cows less than six years of age constitute a very minor element in the active breeding herd. The total cows of this age group in our two samples is nine. (Eight from the St. Paul October 1941 kill of 100 cows and one from Sitka, 1950.) Of these, seven or about 78% were not pregnant. The conclusion that few cows below the age of 6 years are breeders cannot at present be considered as more than a tentative working hypothesis. Additional samples of cows are necessary to clarify this point.

If the fragmentary evidence we have to date is a correct indication of the breeding habits of the female fur seal, we need to revise our thinking on this score. In other words, if cows below the age of six are to be considered as part of the breeding herd it is possible that a proportion greater than 25% must be taken as the segment of non-breeding females in the herd.

Optimum breeding age.--If the small Sitka taken sample is indicative of the herd as a whole a glance at Table 1 would indicate that seals in the age group 6-9 are the best breeders. All were pregnant. Of the 29 seals ten-years-old or older, 9 or 31% were not pregnant. The above data is not supported by the 100 cow kill on St. Paul Island. In the 6 to 9 year group 13% were not pregnant and in the age 10 or older group 12.5% were not pregnant. Thus our presently available data indicates that more material is necessary before we can state what constitutes the

optimum breeding period in the life of a cow fur seal.

The above analysis indicates that our samples of cows are insufficiently large at present and that the cows taken both on St. Paul and at Sitka segregated themselves to an unknown extent. The scarcity of animals in the younger age groups is indicative of such segregation as suggested on page 9 of our 17 February 1950 report. Further natural segregation is indicated in the Sitka sample. The Sitka date might lead us to suspect that few seals below the age of 10 years are in the Sitka area in the latter part of March unless prompted by pregnancy. After the age of 10 the migratory habits are perhaps more firmly established and the animals, accustomed to an early arrival on the breeding grounds, migrate in that direction regardless of whether or not they are pregnant.

Summary

1. Aboriginal sealing activities are undertaken in the Sitka region by few individuals. These men, professional fishermen, say they go sealing mainly because jobs about town are seldom available to them since they leave when the fishing season begins.

2. We believe that fewer male seals are taken by the sealers near Sitka than the records of past years indicate. Of 41 seals taken in 1950 all were females. The natives say they seldom get a male. Disproportionately large numbers of males reported in the past are probably the result of faulty methods of sex determination.

3. Seals are taken most easily by the Indians when the animals invade the quiet waters of inlets, mostly during the period from late January to late March.

4. Stomach analyses and pelt studies of the seals taken at Sitka are yet to be completed.

5. Of the 41 female seals taken, ten or about 24% were not pregnant.

6. The male fetus averages somewhat larger than the female fetus during late March.

7. Of the Sitka taken seals those in the age group 6-9 showed the highest percentage of pregnancy. This condition was not confirmed by the fall 1949 St. Paul sample of 100 cows.

8. Pregnant seals below the age of six years are strikingly absent from our fall 1949 and spring 1950 samples of female seals. The herd should naturally contain a large percentage of young animals. This lack of young pregnant cows in our samples indicates that the females are segregating themselves to an unknown extent. We need additional samples similar to those taken in 1949 and 1950 in order to better understand the breeding habits of the female fur seal.