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BEAVER STUDIES, ISLE ROYALE NATIONAL PARK, 1984

by

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Beaver numbers have been monitored every other year after leaf fall since 1978 by aerial counts of food piles and other signs of activity. Complete counts also were made in 1962 and 1974, and partial counts in 1969 and 1973. Table I summarizes the complete counts. All were done by Philip C. Shelton.

Table 1. Aerial counts of beaver colonies, Isle Royale National Park

<u>Colonies with food piles</u>						Sites with fresh cutting or fresh mud on house or <u>dam</u>	Total sites with any sign of <u>activity</u>
<u>Year</u>	<u>Total Number</u>	<u>Number (%) by habitat</u>					
		<u>Stream</u>	<u>Lake</u>	<u>Harbor</u>	<u>1936 Burn</u>		
1962	125	84(67)	26(21)	15(12)	43(34)	-	-
1974	286	251(88)	24(08)	11(04)	102(36)	30	316
1978	129	99(77)	19(15)	11(08)	48(37)	27	156
1980	83	58(70)	17(20)	08(10)	13(22)	39	122
1982	125	93(74)	24(19)	08(06)	31(25)	28	153
1984	151	129(85)	17(11)	05(03)	53(35)	53	204

*Stream, lake and harbor add to 100 percent.

Fluctuations in beaver numbers during this period are thought to be influenced primarily by wolf predation. In the early 1960's the population was recovering from a low in the 1950's which probably resulted from epizootic tularemia (Shelton, 1966). As the population increased up to at least 1974, wolf predation on beavers increased as shown by the increased presence of beaver remains in summer wolf scats. The wolf population expanded rapidly during the 1970's. Beaver numbers declined through the late 1970's as the wolf population continued to expand, with minimum beaver numbers occurring in 1980, the same year as maximum wolf numbers (50). Since 1980, the wolf population declined dramatically to 14 animals in 1982, then recovered to over twenty, approximately the level of the 1960's. The beaver population increased from 1980 to 1982 and continued to increase through 1984.

The role of beavers in influencing wolf numbers is less clear. Moose are the primary food of wolves and changes in availability of moose may have been the primary reason for the dramatic increase in wolves during the 1970's (Peterson and Page, 1983). However, the correlation between beaver and wolf numbers is remarkable, and suggests that although beavers may not contribute a large proportion of biomass of wolf food, their contribution may come at a critical time for wolves, near their pupping time in early spring, and thus could exert an influence on wolf numbers out of proportion to the year round biomass contribution.

In 1984, Shelton spent the period 16-24 October on the island. Aerial counting was accomplished in a total of 14.5 hours on 18, 20, 21, and 22 October, in a float-equipped Piper Super Cub, piloted by Tom Wunderlich of Shawano Flying Service, Shawano, Wisconsin. Although this was the first

survey flown by Wunderlich, his familiarity with the island from flying larger aircraft on Park Service contract since 1973, and his keen interest in the success of the operation, made the count fully comparable with any previous ones. Favorable weather conditions and complete leaf fall contributed positively to the count.

The 1984 results indicated a continued recovery of beaver numbers from the low in 1980, to numbers slightly over half the maximum number recorded in 1974. Distribution by habitat was similar to previous patterns in that most of the change was in stream-dwelling beavers, and the percent contribution of the area burned in 1936 was back up nearly to what it was in 1974. Harbor beavers continue to decline; many of these colonies are among the oldest established colonies on the island and their food supplies of deciduous vegetation continues to be depleted.

Sites with signs of activity but without food piles increased to an all time high. The interpretation of the occurrence of large numbers of these sites in 1980--that they represented colonies broken up by wolf predation--does not seem appropriate for 1984. Several other interpretations are possible: They could be incipient colonies, sites to which young beavers have recently dispersed, but where only one or two animals occur and where food piles are nonexistent or too small to detect. Many of the sites were houses that looked like they had fresh mud; these could have resulted from weather phenomena that affected the appearance of the houses. Four similar looking houses could be seen in Lake Ojibway. Only one was known to be occupied, but the others probably had been used earlier in the year, probably by the same beavers, and retained their fresh look. These sites may also represent food shortage at these sites. Beavers may have been present but were eating

all they could find and had not stored anything for the winter. At Lake Ojibway, for example, the occupied house did not have a food pile visible either from the air or from the ground, yet trapping showed the presence of a colony of normally healthy beavers. These beavers could overwinter on aquatic vegetation foraged under the ice.

Live trapping at two colonies, one on the upper end of Tobin Creek and in Lake Ojibway, resulted in capture of seven animals (Table 2). Nothing in the physical characteristics or parasite incidence could be interpreted as abnormal. There were three multiple captures: two kits in the same trap on Tobin Creek 18 October; a kit and a yearling together on Lake Ojibway 19 October; and one of the same kits and a large adult together on Tobin Creek 21 October. Multiple captures have occurred before, but never with such frequency. Kits are almost always involved, as they were in these three cases, probably because kits stay close together and often stay close to an older beaver. Another unusual event was the harassment of the two kits in the trap on Tobin Creek 18 October by a wolf or wolves. The trap was pulled most of the way out of the water and the surrounding area was well trampled. Numerous wolf tracks were obvious. The beavers were protected by the heavy mesh of the traps and were only superficially injured; both had patches of hair up to a centimeter in diameter missing on their backs, but the skin was not broken. One had the skin peeled back on its nose at least a centimeter. Bleeding had ceased on all injuries, and the beavers behaved normally when released. One of the kits, the least injured, was recaptured with a large adult three nights later, in the same trap. The adult had a severe laceration 2 cm wide and 7 cm long extending from between the ears to and including the right eye, which protruded grotesquely and was not functional. This animal was released without further handling and so was not sexed, although

it probably was the adult female, since the male of the colony had been captured previously. When released this beaver submerged immediately and swam directly, as determined by the bubbles released, to the house. She did not seem at all impaired by her injury. The injury was several days old at the time of this capture, and could not have been caused by the trap, unless it happened when the two kits were caught in this trap three days previously. It is also possible that she was injured by the wolves, possibly at the time the two kits were in the trap.

Table 2. Results of beaver trapping, Isle Royale National Park, October, 1984.

<u>Colony</u>	<u>Number of Trap nights</u>	<u>Animals Captured</u>	<u>Parasite</u>
Tobin Creek	11	18.5 kg male E20 kg female (?) kit, 4.5 kg kit, 5.0 kg	not checked not checked 1 beetle 1 beetle
Lake Ojibway	12	Yearling, 12.5 kg kit, 6.0 kg kit, 6.5 kg	none none none

Trapping was not extensive enough to indicate whether there were any changes in number of beavers per colony since the early 1960's when the number per colony was calculated to be 6.4 (Shelton, 1966). It is unlikely, however, that the sites without food piles contained more than an average of two beavers per site. A reasonable total population estimate for fall 1984 then would be: 151 colonies with food piles, with 6.4 beavers per colony plus 53 sites with other fresh signs at an estimated two beavers each for a total population of 1072 ($151 \times 6.4 + 53 \times 2 = 1072$).

Beaver food relationships were not studied extensively, but notes on cutting and food pile content were made at 12 active sites visited, and a few observations were made from the air.

On the ground, at nine sites where signs of fresh cutting were observed, only two had cut any aspen (Table 3). Of seven food piles observed, four showed only alder, although undoubtedly other species were hidden from view under the alder; one had birch and alder, one birch, aspen and alder, and one had hazel and red maple.

Table 3. Summary of observations on fresh cutting and of food piles, October, 1985, Isle Royale National Park.

<u>Species Cut</u>	<u>Number of Sites</u>
Birch	2
Birch, Aspen, Alder	1
Birch and Mountain Ash	1
Birch, Hazel, and Alder	1
Black ash, Dogwood, and Hazel	1
Aspen and Balsam Fir	1
Hazel and Red Maple	1
Alder only	1

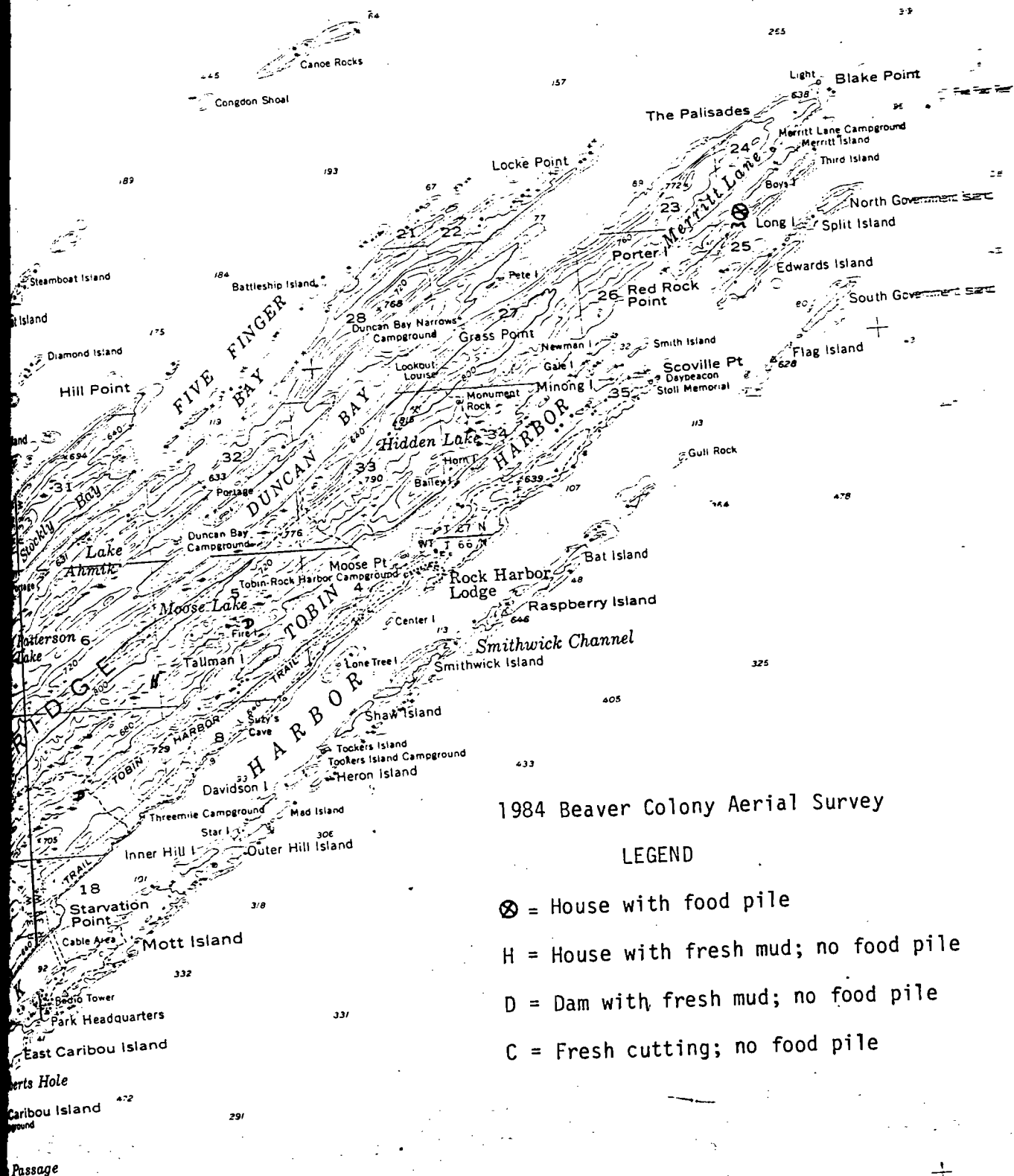
<u>Species Identified in Piles</u>	<u>Number of Food Piles</u>
Alder only	4
Birch and Alder	1
Birch, Aspen and Alder	1
Hazel and Red Maple	1

From the air, aspen cutting was identified at 15 sites, including three in the 1936 burn and 12 in the 100-year-old forest on the northeast third of the island. Among these 12 were five ponds that had been built within the last one to three years. At two of these, aspen trees had been cut that fell into the ponds. At several others aspen cutting was less than 10 metres from the pond, and the maximum distance noted was 25 meters. Thus, although beavers have occupied some sites for fifty years or more and have thoroughly depleted food resources, there are still new sites being occupied, and old growth aspen is still being exploited.

References

- Shelton, Philip C. 1966. Ecological Studies of Beavers, Wolves, and Moose in Isle Royale National Park, Michigan. Ph.D. Diss. Purdue University, 308 pp.
- Peterson, Rolf O. and R. E. Page. 1983. Wolf-moose Fluctuations at Isle Royale National Park, Michigan, U.S.A. Acta Zool. Fennica 174: 251-253.

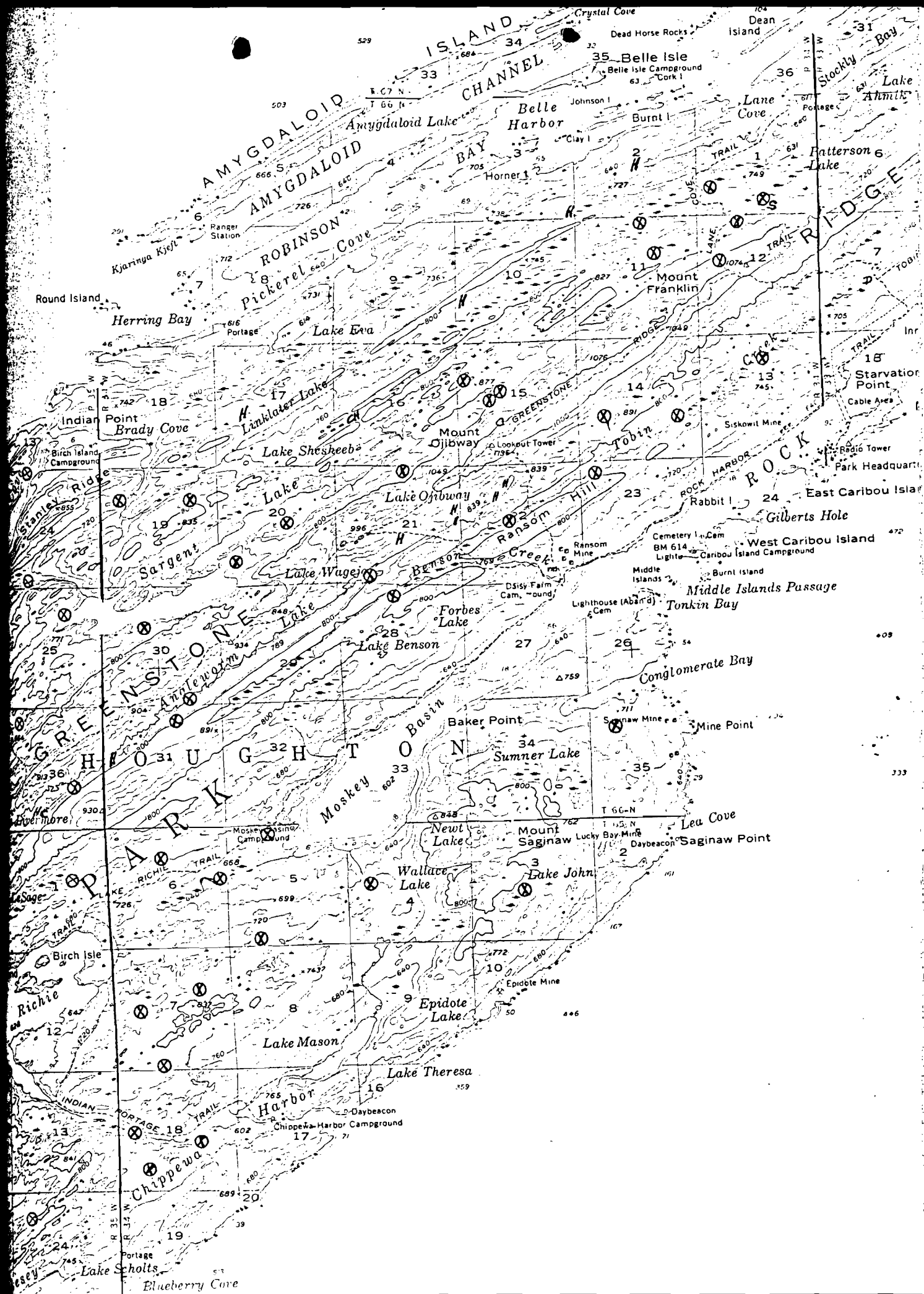
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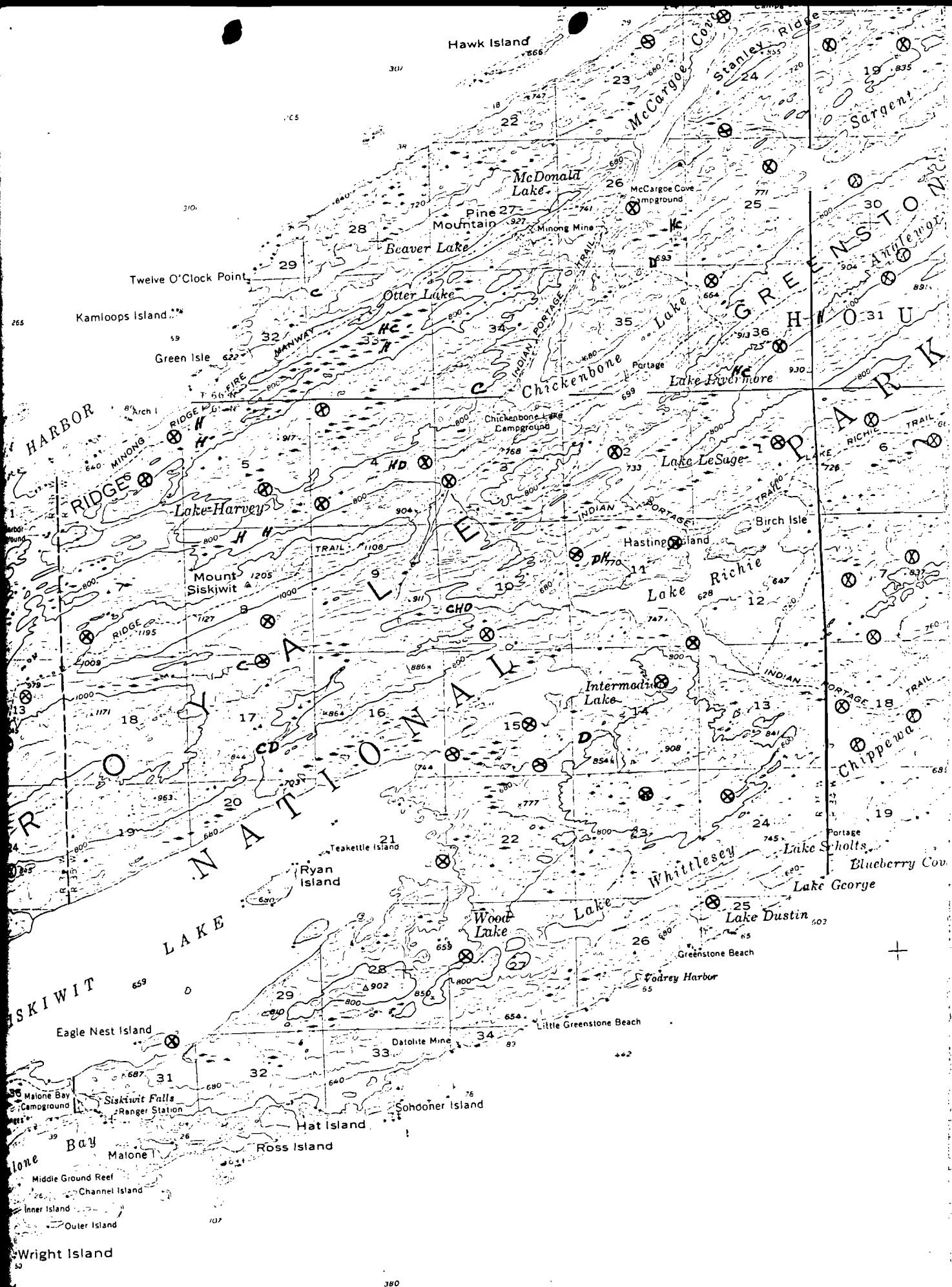


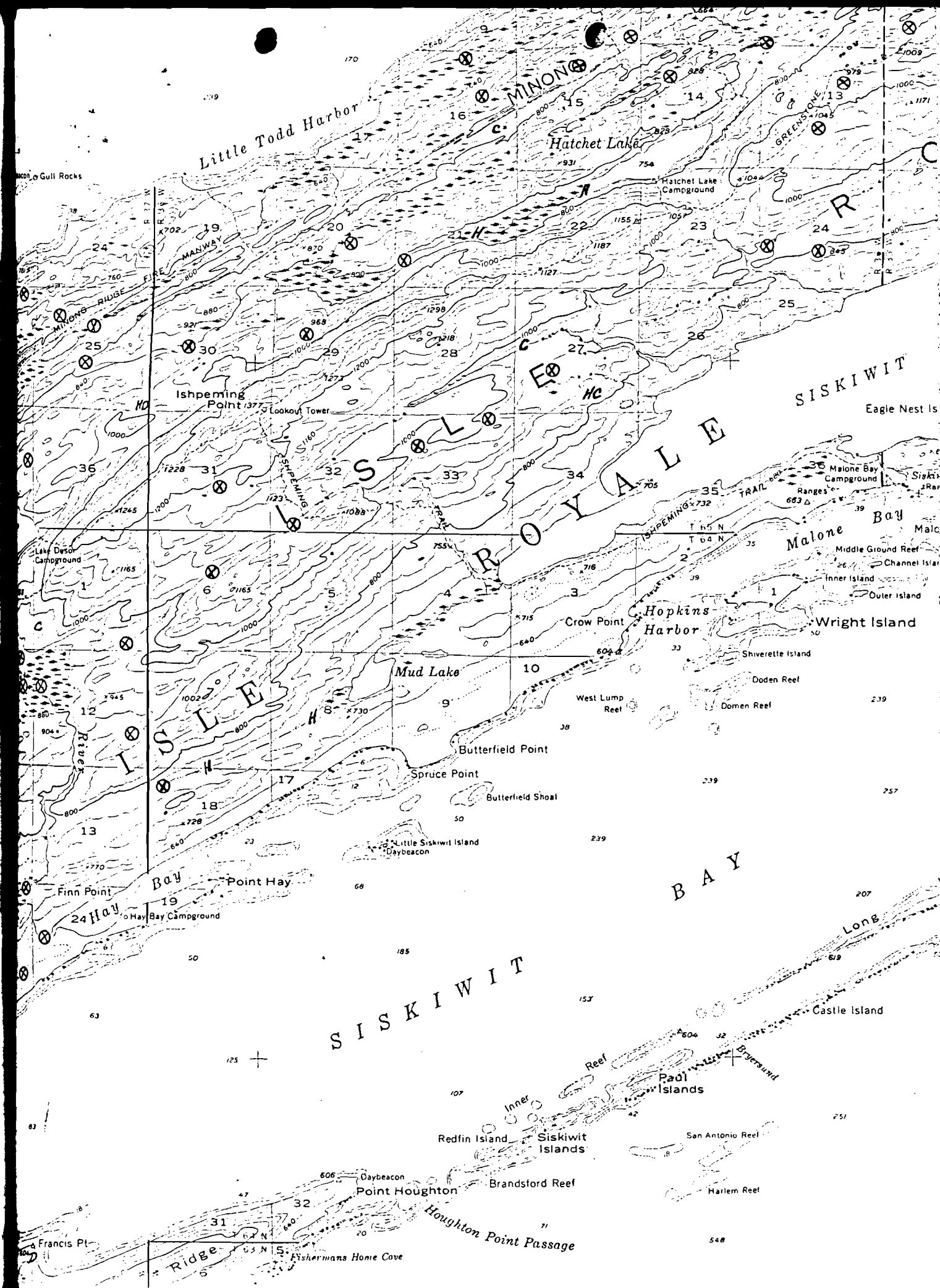
1984 Beaver Colony Aerial Survey

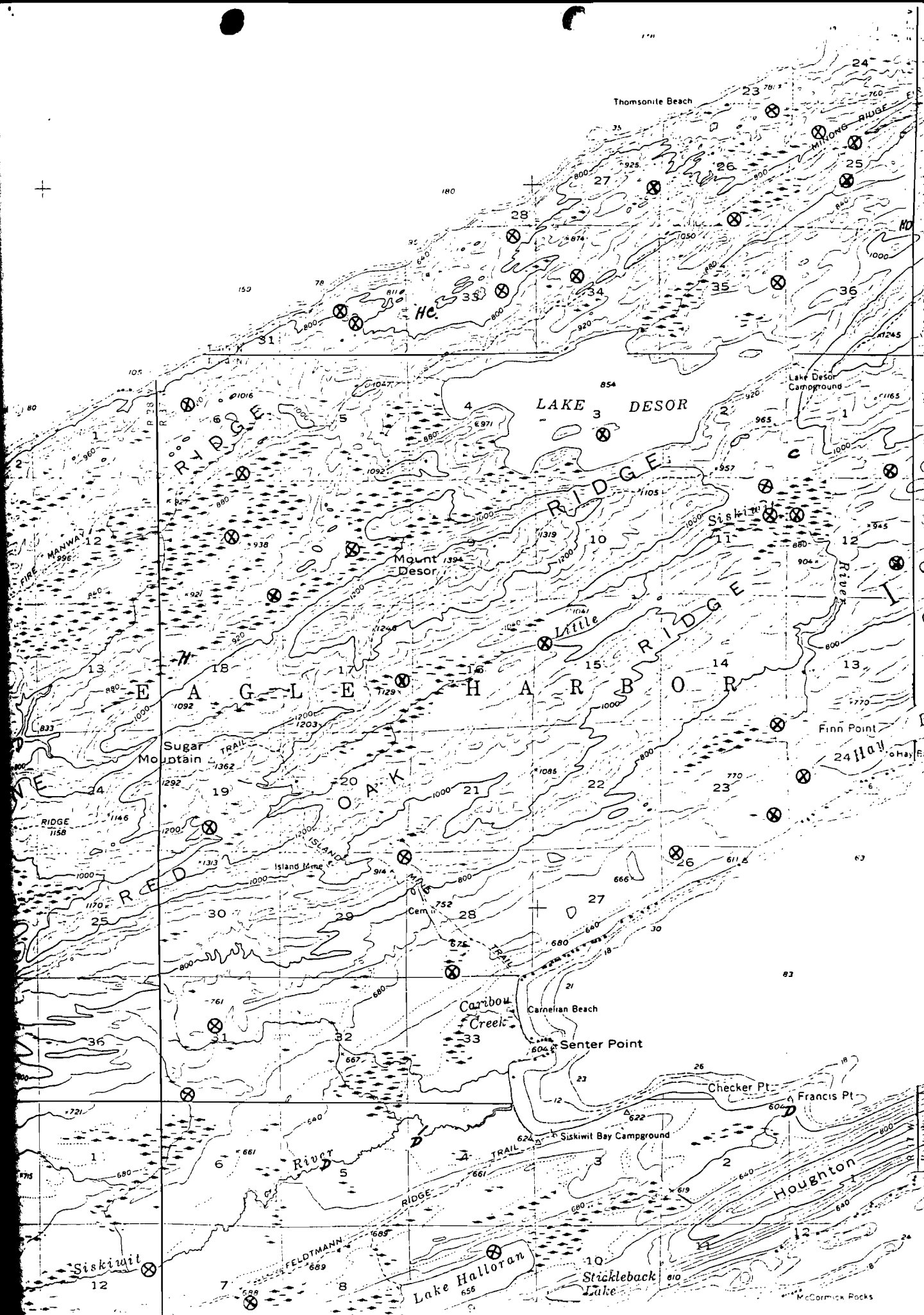
LEGEND

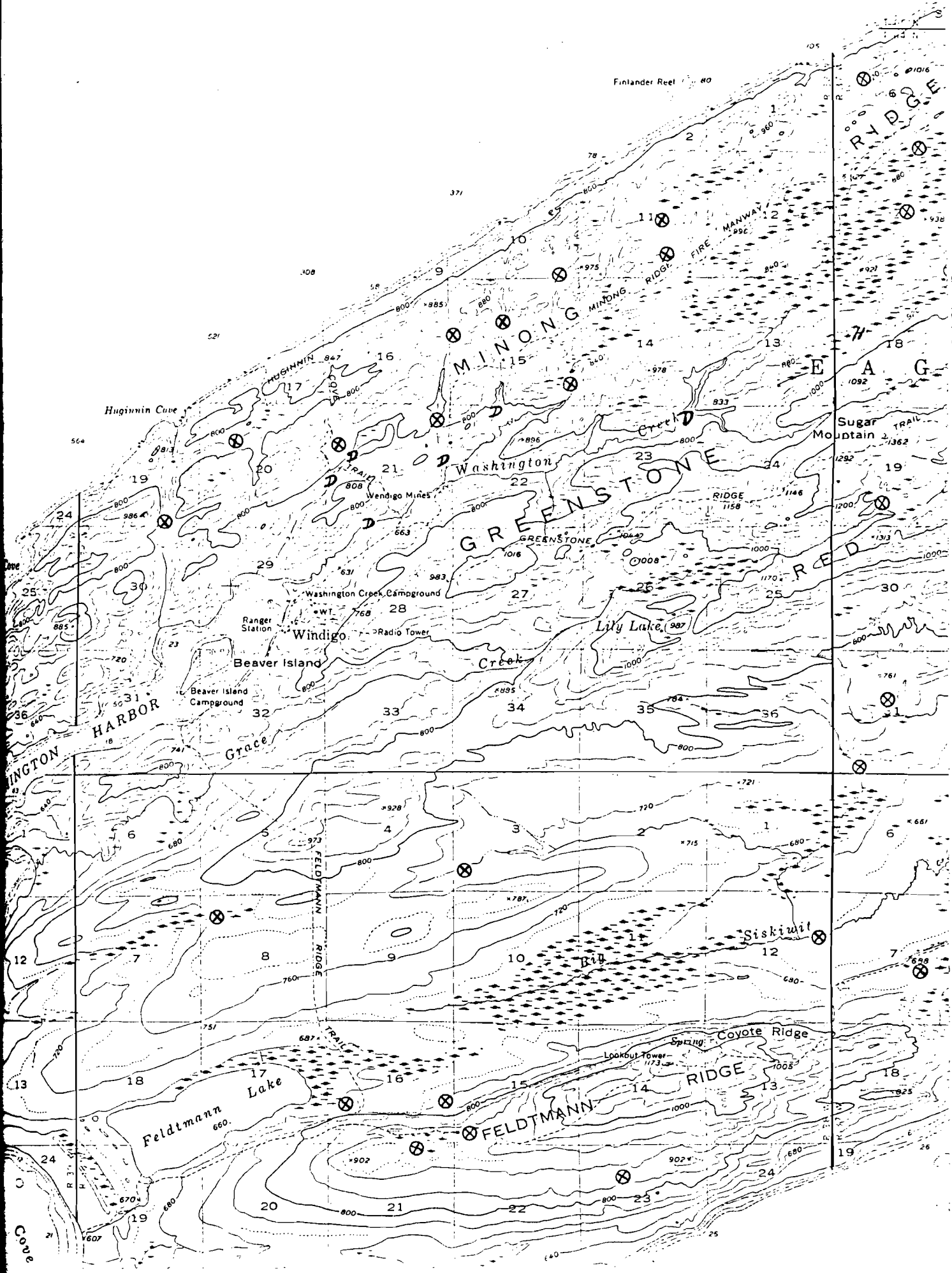
- ⊗ = House with food pile
- H = House with fresh mud; no food pile
- D = Dam with fresh mud; no food pile
- C = Fresh cutting; no food pile











Range 39 West

