L.G. Sugden

Title: Biology, distribution and productivity of Arctic geese migrating through northern Alberta.

Project Number: CL-1-1

Investigator: Lawson G. Sugden

1. Objectives:

(a) To evaluate goose migration habitat in northern Alberta and assemble information upon which to base a sound management plan.

(b) To determine the migration phenology of Arctic geese species passing through the Hay-Zama Lakes, and Athabasca-Peace Delta areas.

(c) To determine the feasability of estimating annual production of geese (Whitefronted geese in particular) in northern areas prior to hunting in the south.

2. Justification:

In recent years, considerable work has been done on the biology of Arctic geese. Evidently, populations are made up of rather discreet flocks which, when enough is known about them, can be managed as such. Because the flocks are discreet units, they are more vulnerable to local factors affecting production and survival. Thus, there is a need to know more about these geese in order to effect safe management practices.

Various studies are underway on the Arctic breeding grounds and from the prairie staging areas, south to the wintering grounds. However, apart from a few aerial counts, little work has been done on geese utilizing the Hay-Zama Lakes and Athabasca-Slave Delta Areas. These areas comprise some of the most critical migration habitat for a large part of the western Arctic goose population.

We not only need to know more about the areas from the point of

view of habitat management but also from the point more about the goose flocks utilising them. A study in the two northern Alberta areas undertaken while the southern Saskatchewan and Alberta work continues should contribute significantly to an understanding of the population dynamics of these important game species. The need for information upon which to base future habitat management will be indicated in the following section. To some extent, the project objectives are included in the first five phases of waterfowl research and management investigations endorsed by the International Migratory Bird Committee, in 1961.

3. Review of literature and related work:

For the most part, results of studies of Arctic geese which migrate through northern Alberta are unpublished. Most work is still in progress and it will require several years to obtain complete results from banding. Preliminary data from Tom Barry's Anderson River banding and banding in Alaska suggest some significant facts. Whitefronted geese passing through the Hay Lakes area are believed to originate in Alaska. From there, some at least stage on the Hanna-Kindersly area. At that point there appears to be a split - some migrating through the Central Flyway, while others cross to the Pacific Flyway. Anderson River whitefronts apparently do not use the Hay Lakes area but may use the Athabasca-Peace Delta area. In any event they definitely stage on Kinderaley area. Snow geese may have a similar distribution during migration. Ross' geese are apparently restricted to the more easterly area both in fall and spring. Data on migration phenology show species differences. Whitefronts and Ross' geese are early migrants. Canadas follow these and in turn are followed by Snow geese. The foregoing is but a sketchy account and serves only to indicate the type of information

being obtained from banding and census. Annual data on reproductive success are being obtained on the breeding grounds and attempts will be made to relate these to indices obtained during migration.

The cooperative goose research programme in southwestern Saskatchewan and southeastern Alberta organized by Alex Dzubin has yielded significant results in its early stages. Data on migration phenology, population size and distribution, age and sex ratios, harvest, and physical characteristics have contributed significantly to our knowledge of Arctic geese.

Some work has been done in the two northern Alberta areas with respect to goose studies and sanctuary development. Each area is discussed separately below.

Hay-Zama Lakes

Goose studies: - Comparable aerial goose counts were made during two years. In one year, an attempt was made to synchronize counts with similar counts in southern areas. Results are shown below:

Date	Canadas	Whitefronts	"Dark Geese"	Snows	Swans	Observer
Sept.12,1959	372	13,200	120	2,200	0	Webb
Sept.22,1959	2,400	12,700	125	3,300	0	Webb
Oct.2,1959	5,500	8,400	0	88,000	12	Barry
Oct.9,1959	3,000	0	0	5,200	250	Barry
Sept.4,1960	1,500	9,000	200	0	0	Sharp
Sept.22,1960	700	300	0	130,000	70	Barry
Sept.28,1960	206	67	0	52,500	0	Barry

The number of geese stopping at the Hay Lakes has been estimated as several hundred thousand in some years. Species composition is roughly 15% Canadas, 35% Whitefronts, and 50% Snow geese.

In 1956 and 1957, efforts to trap geese by Fred Sharp and Bob Webb were thwarted by high water. A few bag checks have been made from time to time. These usually covered but a few days. The harvest varies considerably from year to year and is influenced by water conditions. When low (normal?) water prevails, access is better and more hunters visit the area. Harvest by local Indians has been estimated at 2000 geese in good years. Kill by transient hunters in good years is probably similar. As many as 15aircraft have been seen at Hay Lakes at one time.

Sanctuary development: - For over ten years, considerable interest has been shown in the Hay Lakes area by waterfowl people. Early surveys by R.H. Smith (U.S.F.W.S.) indicated the importance of the area for duck production. The excellence of the habitat is reflected by one of the most dense duck populations encountered in his northern ~~surveys~~ surveys. (The area is probably of equal importance as migration habitat for Ducks).

In 1954 Ducks Unlimited completed a dam andspillway which helpedd to stabilise water levels over much of the area in dry years. As a result of DU work , the Alberta Water Stabilization Board placed as reserve on the area in 1958.

In October 1954, H.R. Webster visited the area and assembled available information on all aspects of the waterfowl resource. He was particularly concened with hunting and its effect on goose populations and loud statue. During the period, 1954 to 1959, suggestions were put forth by several groups and individuals to create some form of sanctuary which would preserve the area and protect the geese from excessive hunting which was predicted.

In 1959, T.W. Barry and R.D. Harris reviewed the problem and reviewed all available information. Through Barry's efforts, a meeting

of interested people was held in early 1960 to discuss the Hay Lakes situation. Discussions considered, for the most part; (1) the possible effects of commercial or agricultural encroachment on the area, (2) the effect of aircraft on migratory geese, and (3) the effect of the proposed flood control ~~pol~~ project on the area. As a result of the meeting, the area has been reserved in the name of the Alberta Fish and Wildlife Division to provide greater protection from encroachment. In addition, the possibility of using the Migratory Bird Sanctuary Regulations to create a managed Sanctuary with controlled hunting has been under consideration by authorities concerned. It is only a question of time before more intensive management will be needed.

Athabasca-Peace Delta:

Complete and comparable aerial goose counts have been made in two years. Results of the censuses, made by Tom Barry are shown below:

Date	Canadas	Whitefronts	Snows	Swans
Oct.1, 1959	3,100	3,900	20,300	32,000
Oct. 9,1959	2,800	00	8,300	11,100
Sept. 27,1960	490	900	6,300	1,570
Oct. 4, 1960	672	283	7,500	154

J.D. Soper (1951) made a count in 1949, however it was not complete. He was primarily interested in sampling duck densities.

The Richardson Lake Sanctuary was established in 1953, to provide protection for Ross' geese which at that time were low in numbers. Because the Sanctuary occupies but a small part of the entire goose habitat its influence on goose populations is probably slight. Hunting pressure on the delta is not heavy since the area has poor

access and a low resident hunter population. However, it is probable that some form of managed sanctuary (as proposed for Hay Lakes) will be necessary in the future. The need would be more acute should Wood Buffalo Park be returned to the province. A large portion of the delta waterfowl habitat now he lies inside the park and is thus assured protection as long as the park exists.

4. Location and description of area:

Hay-Zama Lakes: - H.R. Webster provided a general description of the area in his unpublished report of October 29, 1954 (File WLU 74-9-6). The area is located in northwestern Alberta about 420 air miles NNW of Edmonton and 60 miles by bush road west of Upper Hay River Post. The waterfowl habitat covers about 200 square miles. Much of that is made up by two large shallow lakes (Hay and Zama) as well as several smaller lakes. Hay Lakes is about 1,050 ft. above sea level. Several small rivers and creeks flow into the lakes and these have created a delta-like condition on the low flood plain of the adjacent Hay River. Evidently the shallow nature of the lakes creates optimum conditions for growth of aquatics which are reported as abundant.

Adjacent areas are subject to flooding during high water (which may persist throughout the year) and the actual area under water varies considerably. In 1962 water levels were at a record high and most of the area was flooded including part of the settlement. Ducks Unlimited estimated that the water was 9 feet above their dam.

Willows border much of the shoreline. A good deal of the land surrounding the lakes is comprised of grass meadows interspersed with parkland trees and shrubs.

Three Indian Reserves, a trading post and a Roman Catholic mission are situated within the area. The resident population includes

approximately 400 Indians and 20 white people. Two air strips are located on the area - one at the trading post and one at the mission. Light aircraft can also land on meadows near Zama Lake in dry years. Except after freeze-up, the road from Upper Hay River Post is usually passable only to 4-wheel drive vehicles. Only during dry years can automobiles travel the road and then not without difficulty.

Athabasca-Peace Delta: - J.D. Soper (1951) described the area in some detail. It lies 350 air miles NNE of Edmonton. The waterfowl habitat occupys about 1500 square miles and is made up of lakes, marshes and streams which, at one time, were part of Lake Athabasca. Silt, deposited by the Peace and Athabasca Rivers has formed the vast delta. More than half of the delta is covered by water - lakes, ponds, streams and channels. The large lakes - Claire, Mamawi, Beril and Richardson - are remnants of the original west end of Lake Athabasca. Extensive mud flats occupy the west end of Lake Athabasca during periods with low (or normal?) water levels. At times, heavy run-off and ice jams cause water to inundate much of the lowland on the delta.

Apparently, flood conditions can have a marked effect upon waterfowl use. Traditional feeding or loafing areas may be temporarily lost. This may cause earlier than usual migration.

Soper was impressed with the abundance of waterfowl food plants on the delta. He rated it as the best duck producing area in the Mackenzie River drainage basin and as one of the most important in the Canadian Northwest.

The approximate proportions of area on the delta under differing status are as follows: National Park, 79%; Provincial Crown Lands, 10%; Indian Reserve, 8%; and Migratory Bird Sanctuary, 3%. Percentages include water area.

Human population is sparse and is estimated at about 1,000 people, most of which are Indians. Principal concentrations are on the Indian Reserves near Richardson Lake and at Fort Chipewyan on Lake Athabasca.

5. Methods:

a. Aerial census: - At least two aerial counts will be made on each area each year. It is hoped that additional lakes to the north can be surveyed at the same time. Attempts will be made to correlate counts with similar surveys being made on prairie staging areas.

b. Ground observations:- Whenever possible, age ratio, and family flock counts will be made. This may be difficult because of the flatness of the terrain and large size of lakes. It may be possible to obtain these data by observing flying birds. Observations will be made on general movements of geese to and from the area.

c. Trapping: - Provided water levels are not high, it should be possible to trap and band geese with boom traps. Special effort will be made to capture whitefronts. It is expected that a colour-marking or neck-banding phase will be involved, particularly if simultaneous observations are being made on the prairies. With successful trapping additional information on sex and age ratios, weights, and physical characters will be obtained.

d. Bag checking: - Some bag checking should be possible. The amount will depend upon the number of hunters and priority of other phases. Again age and sex ratios, measurements and possibley gizzard material and be obtained.

6. Materials and Equipment:

Marsh vehicle (airboat or "Jiger"-type), 6 boom traps, detonator, ohmeter, wire, scales, spotting scope, canoe, camp equipment, banding materials, colour-marking materials, portable tape recorder, 2 sw.

transreceivers, gas and oil, food supplies, cannon charges, plant press.

7. Personnel and Cooperation:

Field work by Sugden aided by technician and/or local Indian labour. Provincial biologists may provide part-time help. It is probable that the provincial biologists will assisttwith the aerial surveys - both in supplying an observer and sharing costs.

8. Duration:

The project is planned for 2 seasons of ground work and 3 or 4 of aerial census. The period August 15 to October 15, 1964 will be spent at Hay Lakes. In 1965, the same period will be spent at Delta.

9. Total Cost: ? 1964 + 1965 ?

1954 - $1200

1955 - $2400

Project Total $6600

Lawson G. Sugden,
Wildlife Biologist.
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References:

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