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A cosmopolitan duck moulting resort; Takslesluk Lake Alaska

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Description of the Area

Takslesluk Lake lies about 40 miles (64 km) northwest of Bethel, Alaska at 61°0 N and 16°35 W. It is near the centre of the 26,000 sq. miles (67,340 sq. km) of waterfowl habitat on the Pleistocene Delta of the Yukon River. Although most of the boreal forest of Interior Alaska lies to the northeast of Takslesluk Lake and it is nearly 400 miles (640 km) south of the Arctic Circle, the climate and vegetation are considered truly Arctic by most authorities. (Stonehouse, 1971; Freuchen & Salomonsen, 1958).

The entire Delta area is characterized by low tundra dotted with thousands of lakes. The coastal areas within the Clarence Rhode National Wildlife Range have large goose nesting populations described by several observers (Spencer, Nelson & Elkins, 1951; Hansen & Nelson, 1957; Nelson & Hansen, 1959). Inland around Takslesluk Lake the habitat is dryer and the climate less marine resulting in slight vegetative changes (Walkinshaw & Stophlet, 1949; Williamson, 1957; Burns, 1964). Ducks rather than geese become the most abundant form of waterfowl in the central part of the Delta. A few miles east of the banding site scattered spruce *Picea* spp. and birch *Betula* spp. appear as pioneers on the tundra but the nearest real forest in 100 miles (160 km) east.

The Delta is known for its large duck breeding population. Table 1 shows the estimated average fall population of ducks on the Delta. These figures were compiled from 14 years of air survey data, 1957–1970 (King & Lensink, 1971).

Takslesluk Lake is characteristic of the central Delta. It is a rather large lake for this pothole area, being 12 × 3½ miles (19 × 6 km) in extent. It has a shallow mud bottom and is probably not over 15 ft (4·5 m) deep anywhere. Some 10,000 ducks normally moult their flight feathers here. Summer storms from the southwest with winds of 20–40 knots (32–64 kph) make this a difficult area in which to work.

There are two Eskimo villages, Kasigluk and Nunapitchuk within 15 miles (24 km) of Takslesluk Lake on a connecting waterway. These people, over 600 of them, are a long way from the coast and the major rivers where most Eskimos live. They rely heavily on the resources of lakes and marshes and have traditionally made much use of the waterfowl of the area. These tundra citizens use boats to drive the flightless birds to one end of the lake where they can club, shoot, net or otherwise take possession of some hundreds of them in a single day.

Methods

During each of the 3 years of banding, large drive traps of the style used at Ohtig Lake (King, 1963) were constructed at the east end of the lake. These traps consisted

Table 1. Breeding populations in Alaska of species banded at Takslesluk Lake, and numbers banded there in 1963, 1964, 1965 and recovered by the end of 1972
(Goldeneyes not separated by species in air surveys)

	All Alaska	Yukon Delta	Percent on Yukon Delta	Number banded	Number recovered
Pintail	813,000	288,000	35%	6	0
Canvasback	38,000	1,200	3%	50	7
Greater Scaup	449,000	326,000	73%	2,294	176
Lesser Scaup	547,000	10,000	2%	31	2
Common Goldeneye				108	3
	108,000	21,000	19%		
Barrows Goldeneye				6	1
Bufflehead	64,000	2,500	4%	204	7
Old Squaw	470,000	292,000	62%	1,784	34
Total	2,489,000	940,700		4,483	230

Figure 1. The large corral-type duck-trap at Taksleshuk Lake, Alaska. At the back of the banding crew's camp, the typical Yukon Delta habitat extends 100 miles to the sea. Tent at the water's edge was used to protect the band-record keeper from the weather.

of a 100-yard (19-m) net lead, a 3,000-sq. yard (2,500-sq. m) holding pen of chicken wire, and a small catching pen at the end. The whole trap was in water 2–3 ft (0·6–0·9 m) deep on a relatively flat mud bottom. Two float equipped airplanes and three or four motor-powered boats were used for the drives. It took 12–14 hours to move the ducks the 12 miles (19 km) up the lake.

Duck drives were scheduled each year for early August but as a wind greater than 5 knots (9 kph) make the lake too rough to navigate there was usually a wait for a calm day. In 1963, several thousand ducks were caught on 1 August. As it was dark when the ducks were finally in the large pen, they were left overnight. The next day high winds were putting 2-ft (0·6-m) waves

Figure 2. Ducks in the trap are driven to a small pen in the corner where they can be caught with a dip net and placed in a burlap sack for transportation to the shore.

through the trap, and removing the ducks proved nearly impossible. The high winds continued unabated and on the fourth day those ducks that had not escaped through breaks in the trap were released. Only 201 birds were banded. In 1964 the same method produced a catch of nearly 4,000 ducks in one drive, 3,699 of which were banded. In 1965 continuous high winds, rain and fog again hampered the project and only 583 ducks were banded during a 2 week effort.

The next-to-last column of Table 1 lists the total number of ducks by species banded during the 3-year period. The species composition of the catch bears little relation to the population composition because of the trapping method which was primarily designed for the diving ducks. All birds in the catches were at least 1 year old. This was the first time that Greater Scaup and Old Squaw had been banded in Alaska in any substantial numbers.

It was concluded that the size of the lake plus the quality of the weather made banding at Takslesluk Lake a chancy thing and the project has not been repeated.

Results

By 1972 there were 230 recoveries from the Takslesluk banding. More recoveries of course will continue to come in small numbers but it is appropriate to summarize the data now.

Pintail *Anas acuta*

Only six Pintail were caught, all in 1964, and these gave no recoveries.

Canvasback *Aythya vallisineria*

Canvasbacks are regularly seen on the big lakes near Takslesluk but make up a very small percentage of Yukon Delta ducks. They are more common in the forested valleys to the east. We do not know if Canvasbacks actually nest on the tundra or are present merely as a non-breeding segment of the population. Of the birds banded, thirty-nine were males and eleven females. The seven recoveries are shown in Figure 3. They gave a 2% direct (i.e. same season) and a 14% total recovery rate. The distribution is interesting, with three going to the Pacific Flyway, two to the Mississippi and one each to the Central and Atlantic Flyways. Banding in the Interior indicates this to be typical distribution for Alaskan Canvasbacks.

Figure 3. Approximate location of recoveries away from banding site (all species except Greater Scaup and Old Squaw). X, Banding site; ●, Canvasback; ○, Lesser Scaup; ▲, Common Goldeneye; △ Barrow's Goldeneye; ■ Bufflehead.

Figure 4. Approximate location of Greater Scaup and Old Squaw recoveries. Banding site recoveries in large symbol at site. X, Banding site; △, Greater Scaup; ○, Old Squaw. Number of recoveries indicated if more than one per State or Province.

Greater Scaup *Aythya marila*

Greater Scaups are the most common duck throughout the Delta area. They are found in substantial numbers in all the western and northern tundra areas of Alaska and make up more than 90% of the scaup population of the tundra, with Lesser Scaup contributing less than 10%. In the forested valleys inland the reverse is true with Greater Scaup making up something less than 10% of the scaup population, although they have been found in small numbers wherever banding has been done. More than half the ducks caught at Taksleslu k Lake were Greater Scaup (2,294) and of these 96% were males and only 4% were females. We assume the low number of females caught indicates most of them were still occupied with broods on smaller ponds.

Distribution of the 176 recoveries is shown in Figure 4. The twenty-five recoveries at the banding site indicate a special situation not faced by most scaup populations. There is intensive spring shooting by Eskimos in this area and they have continued to drive ducks at the banding site. Bands recovered by Eskimos in this area are normally kept but not reported. During the summer of 1970 an Eskimo was hired by the Alaska Department of Fish and Game to pay one dollar each for fish tags received in the villages. Through a misunderstanding he also bought some 45 bird bands, eighteen of which were from Greater Scaup recovered at Taksleslu k Lake in July 1969. An additional seven recoveries have been reported from the vicinity over the years. Thus, of the thirty Alaskan recoveries only five were from birds that had left the breeding grounds.

Greater Scaup are common in eastern Siberia and have been heavily hunted there (Dement'ev & Gladkov, 1967) so the lack of recoveries indicates Alaskan birds do not normally go there.

The birds appear to be using wintering areas along the Atlantic and Pacific coasts in about equal numbers, with just a few going to the Gulf of Mexico. The Great Lakes area seems to be an important staging point for the eastern population and they may linger in this area for some time. The recoveries (apart from those at the banding site) split between the Flyways: Pacific seventy-one, Central five, Mississippi twenty-six, Atlantic forty-nine (Figure 2). Four birds banded in New York state and one from Vermont were recovered at the banding trap. The direct recovery rate was 1·3% and total recovery rate to date 7·7%. As only birds that had completed one full migration were banded, the low recovery rate is not surprising.

Table 2 Greater Scaup recoveries by years from banding data (recoveries away from banding site)

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	Total recoveries
West	16	16	11	11	8	5	4	–	–	71
East	15	12	7	5	7	18	8	6	2	80
Both	31	28	18	16	15	23	12	6	2	151
Total %	20·5	18·5	11·9	10·6	9·9	15·2	8·0	4·0	1·4	100

In Table 2, the seventy-one recoveries from Pacific Coast states are compared with the eighty east of the Continental Divide to determine if survival characteristics are similar for birds going either way. For the western birds the recovery rate was greatest the first two seasons and then tapered off consistently. The eastern recoveries were slightly less than the western during the first 5 years, then peaked the sixth year and remained higher than the western rate from then on. This unusual pattern may result from peculiarities of the hunting season or merely from too small a sample. It does appear that the eastern population is more heavily hunted during migration and the western population after they reach the wintering areas. In spite of different mortality patterns the net result is nearly equal with the total recovery rate 6·6% away from the banding site being split 3·5% from the east and 3·1% from the west.

Lesser Scaup *Aythya affinis*

Lesser Scaup are on the edge of their breeding range at Takslesluk Lake, being much more typical of the forest habitat inland. Of thirty-one banded, only a direct recovery from Michigan and an indirect recovery from North Carolina were made. We know from banding in the Interior that Alaskan Lesser Scaup use all four flyways. Recoveries from over 33,000 Lesser Scaup banded in Alaska show a distribution of 20% to the Pacific Flyway, 12% Central Flyway, 40% Mississippi Flyway, 9% Atlantic Flyway, 10% Canada and 9% Latin America (King & Lensink, 1971).

One recovery was made at Takslesluk Lake in 1964 of a male Lesser Scaup banded from a huge congregation of moulting scaup on Ohtig Lake, Alaska, 700 miles (1,120 km) northeast, in July 1963.

Common Goldeneye *Bucephala clangula*

The status of Common Goldeneyes in Alaska is not well understood. They can not be reliably separated from Barrow's Goldeneyes on air surveys and the females of the two species are almost identical, making them difficult to identify unless in hand. Apart from the 108 birds banded at Takslesluk Lake only thirty-one Common Goldeneyes have been banded in Alaska. One recovery from Takslesluk was in January 1967 at Chignik Lagoon on the south side of the Alaska Peninsula and another in the same month from Salton Sea, California (Figure 3). This does not tell us much because either could have been an accidental wanderer and both are within the published winter range for the species (Gabrielson & Lincoln, 1959).

Of the birds caught, forty-three were males and sixty-five were females. As Common Goldeneyes normally nest in trees and there are no trees in the banding area one can only assume that there is a moult migration of a non-breeding portion of the population to tundra areas. Goldeneyes in small numbers are regularly noted in various parts of the Yukon Delta.

Barrow's Goldeneye *Bucephala islandica*

Only six males were caught and one was recovered in November 1965 on Kodiak Island (Figure 3). Recoveries from birds banded in the Interior indicate this is within the expected winter distribution of the species

Bufflehead *Bucephala albeola*

Buffleheads are another common forest breeding species of the Interior that would seem to be out of place on the treeless tundra. They are not known to nest except in holes in trees and although recorded in summer occasionally in the treeless Aleutians probably do not nest there. Of the 204 birds banded only six were females and none of them were recovered. Of the seven male recoveries, four were at the banding site in subsequent years, one was in Interior

Alaska near McGrath in May, one was near Kodiak in December and the only direct recovery was from 20 km northwest of Petropavlovsk, Kamchatka U.S.S.R. in December (Figure 3).

Buffleheads are common winter birds in the Aleutians and other Bering Sea Islands including the Soviet Commander Islands where they are considered stragglers (Gabrielson & Lincoln, 1959; Dement'ev & Gladkov, 1967). The Siberian recovery, the first from mainland Asia, extends the edge of the known Bufflehead range by about 500 miles (800 km).

Long-tailed Duck *Clangula hyemalis*

Old Squaw are typically a tundra nesting species, however, they are regular spring migrants throughout the northern forested portions of the Yukon drainage. Irving (1960) reports them moving eastward in May at Old Crow in the Northern Yukon Territory of Canada and points out they are unknown in the southern Yukon. A few remain in forest lakes through the summer. Apart from the 1,784 Old Squaw captured at Takslesluk Lake, only fifty-six have been banded elsewhere in Alaska. One of the ten Old Squaw banded at Tetlin in 1961 was recovered on the Kamchatka Peninsula in 1969. Of the Takslesluk birds only one was recovered away from the banding site in North America, a male shot in September near Coronation Gulf on the Arctic Coast of Central Canada. Of the sixteen other recoveries from the Bering Sea and U.S.S.R. as shown in Figure 2, five were in May, four in June, one in July and six, August–March. The indications are that Alaskan Old Squaw winter in Bering Sea and the Sea of Ohotsk. Pairing evidently takes place on the wintering area and males follow females to nesting areas throughout Eastern Siberia and Arctic portions of Western Canada and Alaska. There may be an important migration route up the Yukon River valley for birds headed for Western Canada. No wintering in North American waters except the Bering Sea is indicated for Alaskan Old Squaw.

Even including the seventeen recoveries at the banding site the recovery rate, at 1·9%, is low by American standards for a hunted species. The low rate of foreign recoveries after the fourth season could reflect a rather heavy unreported or natural mortality rate. The high recovery rate at the banding site in the fifth year reflects the purchase of bands as described for Greater Scaup.

The sex ratio of the catch is rather interesting with 61% being females. Males appear to be more apt to be recovered by hunters. However, recoveries at the banding site are nearly equal indicating females may suffer natural mortality that compensates for reduced hunting mortality (Table 3).

Discussion

The Takslesluk banding produced some firm new information on the waterfowl that moult on the Yukon Delta. The Greater Scaup distribution to two coasts of the American Continent seems rather well defined for the first time. A brand new concept of Old Squaw distribution from a major North American breeding area is outlined. Interesting recoveries of Common Goldeneye and Bufflehead indicate migration of these species may be more extensive than previously supposed.

Although the sample is small, some in-

Table 3. Long-tailed Duck recoveries by years from banding date

	Number banded	1st	2nd	3rd	4th	5th	6th	7th	8th	All
Recovered away from banding site										
Male		5	1	2	4	–	1	–	1	14
Female		–	1	1	1	–	–	–	–	3
Recovered at banding area in summer										
Male		–	–	–	2	5	2	–	–	9
Female		–	–	–	1	6	1	–	–	8
Total male	689	5	1	2	6	5	3	1	–	23
Total female	1,095	–	1	1	2	6	1	–	–	11
Grand total	1,784	5	2	3	8	11	4	1	–	34

formation on mortality rates for Greater Scaup and Old Squaw indicate these species are not harvested heavily enough to cause concern for their welfare.

We have known for some time that Siberian nesting grounds provide birds for American hunters such as Snow Geese *Anser c. caerulescens*, Black Brant *Branta bernicla orientalis*, Pintail and others, but this project gives the first evidence that North America is producing game birds for Soviet use. This is a significant new illustration of the ultimate need for bird management co-operation and treaties with the Soviet Union. The 10% recovery rate by Canadians of birds from this American lake somewhat reverses the usual concept of Canada one-sidedly raising birds for American consumption. We also learn for the first time what sort of kill results from Eskimo drives of moulting ducks. Obviously the bulk of this harvest is of adult male Greater Scaup, and Old Squaw of both sexes. There would appear to be no significant conflict between this Eskimo take and the hunters to the south. There are no indications of destructive over-harvest or interference with the breeding population and perhaps this may be a good resource utilization for this area. It is unfortunate that it is contrary to the terms of the Migratory Bird treaties between the United States, Canada and Mexico.

Several interesting questions emerge from the project. Why is this region, and, particularly, Takslesluk Lake so popular with species which obviously have such different habitat preferences the rest of the year? Why are specific sex ratios' so different, with both sexes of Old Squaw and Goldeneye well represented but only males of Scaup and Bufflehead? Do these moulting birds represent a portion of a local breeding population or have some of them made long moult migrations from other areas where they were raised? What is the appeal of the tundra for the tree-nesting Goldeneyes and Buffleheads? Why do birds of one species that moult together on the same lake disperse to opposite sides of the Continent for the winter, as do the Canvasbacks and Greater Scaups? How do some Greater Scaup and Canvasbacks manage the problems and hazards of a migration nearly twice the length of the others of their kind? How does such diverse migration develop?

We can only conclude that a great deal more research is needed on these tundra ducks, which are of obvious value to such a widespread human population.

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Summary

In the years (1963–65) Fish and Wildlife Service personnel caught and banded 4,483 ducks of eight species at Takslesluk Lake, Alaska. Recovery of 230 of these bands show a surprising dispersion through 40 degrees of latitude and 180 degrees of longitude or from North Carolina to Central Siberia.

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Plate III. Above: the elegant wild Bewick's Swans *Cygnus columbianus bewickii* fight it out on Swan Lake. Below: the savage looking Black Spur-winged Goose *Plectopterus gambensis niger* is a peaceful inhabitant of the African Pen at Slimbridge.

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