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Distribution and movements of marked caribou in Ungava, July 1974 to July 1975

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Abstract

A cooperative research program on Ungava caribou was launched in 1973 by the Quebec Wildlife Service, Newfoundland Wildlife Service and the Canadian Wildlife Service. The purpose was to gather information necessary for the formulation of an inter-provincial management plan. Numbers, seasonal distribution, migration routes, and population dynamics were to be determined.

This report describes the results of the caribou marking program between July 1974 and July 1975, and describes movements of marked caribou determined from telemetry surveys and visual observations. It is a follow-up to the report of Dauphiné *et al.* (1974) which dealt with studies of caribou movements in the same area in 1973–74.

Method

In late June, early July, late September, and early October 1974, 252 caribou were marked, 49 of them with collar transmitters and 203 with simple collars or ear tags. They were captured and marked in the water in the George and Falcoz rivers. Radio collars are identified in Table 1. Of the 203 caribou marked with simple collars, there were 183 adult females, 16 adult males, one calf (sex unknown), one male calf, and two yearling males. Females were particularly selected for marking. Telemetry surveys were flown in February and April 1975 using a Cessna 340, and in June with a Cessna 337.

From previous telemetry surveys of the Ungava (Dauphiné *et al.* 1974) a number of problems were identified: the long intervals between surveys; no information on movement patterns; radio operator fatigue during the 4 to 6 h survey flights; and the relatively short time that transmitters were in range, due either to the terrain or to possible damage to the transmitter or its antenna. Efforts to solve the latter three problems resulted in different operational procedures and a new detection system.

To reduce operator fatigue, the 49 frequencies used were divided among three operators. Although this increased the probability of detection, the large number of frequencies were still a problem. Each operator could scan his group in four minutes (approximately 15 s per frequency). In that time, the aircraft would fly approximately 18 km. Under normal conditions, some transmitters were detected at a range of 60 km, but others could only be detected at distances of 5 to 15 km. In some cases, the short range was attributable to the severe terrain, but in others antenna breakage was suspected; in either case, the signal could easily be missed unless the particular frequency was being scanned while the aircraft was in close proximity to the transmitter. To reduce the possibility of missing a signal, a spectrum analyzer was incorporated into the monitoring system. This device continuously displayed on an oscilloscope all the signals present in a 2.0 MHz section of the band and their relative strengths.

The signals from the two antennae on the aircraft were matched to the three receivers and the spectrum analyzer with two amplifiers that combined the signals, provided isolation, and terminated the composite signal into four 50Ω ports. To further increase the signal level for the spectrum analyzer and reduce the effect of the ambient electrical noise, the bandwidth was limited to 2.5 MHz at −3 dB with a two section helical filter followed by a two-stage hybrid amplifier with a total gain of 32 dB. Using a Tektronix 1401A spectrum analyzer, the overall system sensitivity, excluding antenna gain, was −125 dBm while displaying a 2.0 MHz segment of the band. The internal bandwidth of the analyzer was limited to 10 kHz and the sweep rate to 20 MHz/s. A normal persistence display was used successfully to detect 25 to 40 ms pulses; a variable persistence display would have been preferred but was not available at the time. The lack of storage facility required constant vigilance by the operator to detect weak signals and differentiate them from random noise pulses.

Aerial transects were spaced at 38-km intervals in order to decrease the range requirement of the transmitters. Visual surveys were flown before the February telemetry survey by the Quebec Wildlife Service and the Newfoundland Wildlife Service to locate winter concentrations of caribou. With the results of those surveys, we hoped that the telemetry survey could be conducted more efficiently by concentrating the survey lines in areas occupied by caribou.

Results and discussion

A total of 44 contacts were made with 39 caribou collared during the spring (June and July) and the fall 1974 (Fig. 9). This total included 22 visual observations, 19 radio contacts and 3 animals shot by hunters. Figures 1, 2 and 3 show the aerial transects flown in February, April and June 1975 respectively, and the positions of the caribou located. Following the poor success obtained in February, when transects were flown only in predetermined caribou concentration areas, an additional survey was flown in April (Fig. 2) covering a much wider area. The June survey covered the known calving areas, except for the Hebron calving ground which could not be surveyed owing to poor weather and an ill-equipped aircraft.

Visual observations made in the fall of 1974 by Luttich (pers. comm.), Newfoundland Wildlife Service (Figs. 4 to 6) show that the majority of collared caribou first moved northward along the George River (some collared animals were

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seen at Wedge Hill a few days after being collared at the Falcoz River), then turned southeast towards the Labrador Coast. In February 1975 (Fig. 7), collared caribou were contacted along the coast of Labrador, mostly south of 56°N; no contact was made in the traditional Fort Chimo wintering area, or along the coast of Ungava Bay where Le Henaff (1975) reported herds, nor were any visual observations of collared animals made by Juniper (pers. comm.) while flying a survey in the Fort Chimo area in February 1975. Reports of uncommonly high numbers of caribou were made by Luttich (pers. comm.) during the winter, on the Labrador coast. During the April survey, higher numbers of caribou were located in the northern part of the Labrador coast (Fig. 2) than elsewhere; two of the caribou located were animals previously located in the southern part of Labrador (Fig. 8). Telemetry contacts indicate a winter shift in some populations towards Hebron Fjord, as reported by Wetmore (1972, 1973) and Dauphiné *et al.* (1974). There was, however, evidence of persistent use of the wintering area south of Mistastin Lake, as two of the caribou relocated there had not moved appreciably. One animal, 4P, was contacted south of Fort Chimo (Fig. 2).

The survey in June did not bring the results expected. The Harp Lake and Champdoré Lake calving areas were surveyed, but the limitations of the aircraft used and continuous poor weather made a survey of the Hebron calving ground impossible. Only one radio transmitter was located northwest of Champdoré Lake, but the continuous presence of the signal at the same location from the April survey to the June survey suggests that the transmitter was on a dead animal or had become detached. However, its presence west of the George River also suggests that some caribou of the George River herd wintered elsewhere than on the Labrador coast in 1974–75.

There is evidence that female A9, visually contacted by Luttich in late fall (Fig. 4) in southern Labrador, and female 22P, which was located twice during the winter south of Mistastin Lake (Figs. 1 and 2) had calved near Champdoré Lake the previous spring. Both of them were collared on the George River in late June, in the path of a massive migration of females and calves coming from Champdoré Lake, and presumably going towards northern Labrador for the summer.

Female 4P, contacted twice northwest of Champdoré Lake (Figs. 2 and 3) had presumably wintered in the traditional area on the Koksoak and Caniapiscau rivers. Apparently the Champdoré Lake calving ground was used by animals from both the Labrador Coast and Fort Chimo area, an hypothesis also supported by track surveys (Juniper, pers. comm.).

The Caniapiscau Lake area was surveyed by McIlveen in October 1974 (Fig. 10) without any success in locating the animals collared there in the latter part of the 1973–74 winter (Dauphiné *et al.* 1974). A survey was also flown in February 1975 (Fig. 1) over Lake Caniapiscau, but no contact was made with any of the collared caribou.

Conclusions

The results obtained in the telemetry and visual surveys in 1975 suggest that the caribou present in the George River area in late September and early October 1974 may not have separated geographically into discrete bands in late fall, rutting period, and winter as was suggested by Dauphiné *et al.* In fact, they showed less variation in their winter distribution than previously indicated, as most of the observations of collared caribou in winter 1974–75 were made only in Labrador, in contrast to the wider distribution of the two previous winters. A factor that may have influenced distribution in the 1974–75 winter was the relative absence of snow on the Labrador coast and a storm in late fall 1974 that covered most of central Ungava with a thick layer of ice. The ice was plainly visible on the hill tops during the February survey. Year-to-year differences in the distribution of caribou in Northern Manitoba were correlated with different snow conditions observed by G. R. Parker (CWS, pers. comm.).

The relatively poor results obtained with the telemetry technique require a reassessment of its value for similar projects. Better success would be obtained if more surveys were flown at shorter intervals, mainly during fall, to determine the general direction of migration. That would reduce the risk of losing track of animals, as happened during this project. In addition, the construction of collars and transmitters could be improved; some radio-collared animals were seen with the antenna missing, which would decrease the expected range to a few miles; collars were seen ragged (Luttich, pers. comm.) which indicates that better material should be used.

Up until now, results obtained by the previous surveys (Dauphiné *et al.* 1974) and those obtained from the surveys reported here confirm the following migration pattern: females calving at Champdoré Lake presumably spend the summer in Northern Labrador, move along George River in the fall and migrate either to the coast of Ungava Bay and the Koksoak and Caniapiscau river valleys or to the coast of Labrador to winter. Females that calve at Hebron also spend the summer in Northern Labrador, are found along George River in fall, and migrate to Southern Labrador to winter. There is also evidence (Wetmore 1973) that some females using the Hebron calving ground winter along the Ungava Bay coast. Some of the females that winter south of Mistastin Lake, in southern Labrador, may calve there instead of migrating to Hebron or to Champdoré Lake. Wetmore (1973) reported females calving east of Border Beacon in the same area where we observed females in February and April; it is possible that they did not migrate before the calving season. There is evidence, then, that a population identified with a given calving ground may use widely separated winter ranges in different years and may come from widely separated wintering ranges in any given year.

More marking on the wintering grounds or close aerial observation of herd movements in the spring would be needed to refine the above model.

Acknowledgements

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Table 1
Collar transmitters applied to caribou in June, July and September 1974 on the George and Falcoz rivers (approx. 56°55′N 65°00′W)

Date applied	Collar no.	Frequency (MHz)	Pulse/s	Sex	Age group
02–07–74	B–18	171.116	2.2	F	A*
24–09–74	19–P	171.134	2.5	F	A
17–09–74	366	171.156	2.0	F	A
24–09–74	C–35	171.160	1.9	F	A
17–09–74	B–24	171.173	2.2	F	A
24–09–74	14–P	171.194	2.7	F	A
17–09–74	A–10	171.235	2.0	F	A
02–07–74	1–P	171.253	2.2	F	A
24–09–74	13–P	171.271	1.8	F	A
02–07–74	23–P	171.336	2.5	F	A
17–09–74	372	171.359	1.4	F	A
17–09–74	373	171.373	3.3	F	A
28–06–74	370	171.415	2.0	F	A
17–09–74	A–4	171.437	2.5	F	A
18–09–74	17–P	171.453	2.2	F	A
02–07–74	4–P	171.476	2.0	F	A
28–06–74	20–P	171.494	2.5	F	A
18–09–74	B–20	171.495	3.3	F	A
17–09–74	371	171.518	1.7	F	A
28–06–74	A–9	171.540	2.5	F	A
28–06–74	21–P	171.577	2.8	F	A
18–09–74	25–P	171.600	2.0	F	A
24–09–74	365	171.619	2.5	F	A
18–09–74	B–21	171.664	1.6	F	A
18–09–74	A–5	171.688	2.8	F	A
18–09–74	5–P	171.720	2.0	F	A
18–09–74	24–P	171.737	2.5	F	A
18–09–74	A–11	171.758	1.6	F	A
28–06–74	B–17	171.776	2.2	F	A
02–07–74	15–P	171.817	2.8	F	A
02–07–74	18–P	171.857	2.0	F	A
29–09–74	22	172.039	2.5	F	A
28–06–74	22–P	172.100	2.5	F	A
24–09–74	A–12	172.118	3.0	F	A
24–09–74	9–P	172.137	3.3	F	A
24–09–74	11–P	172.177	2.2	F	A
28–06–74	10–P	172.213	2.5	F	A
24–09–74	16–P	172.220	2.0	F	A
02–07–74	A–8	172.235	2.4	F	A
24–09–74	B–14	172.257	2.0	F	A
24–09–74	B–16	172.311	2.0	F	A
24–09–74	3–P	172.330	1.8	F	A
28–06–74	368	172.338	2.0	F	A
24–09–74	A–6	172.356	2.5	F	A
28–06–74	12–P	172.419	1.9	F	A
24–09–74	B–19	172.455	2.5	F	A
23–09–74	B–23	172.456	2.0	F	A
29–09–74	B–22	172.478	2.9	F	A
24–09–74	B–15	172.497	2.6	F	A

*A: adult.

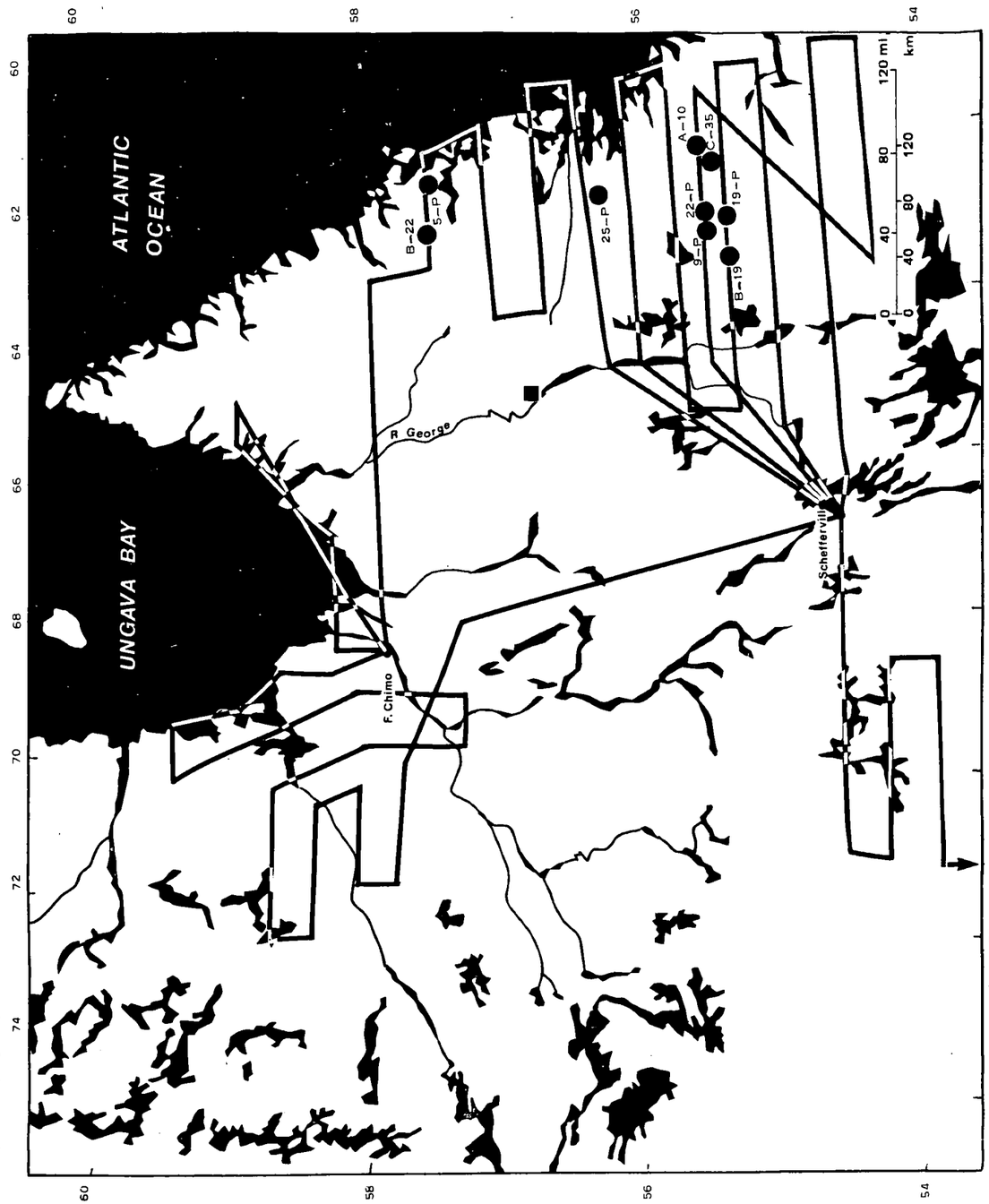

Figure 1
Aerial transects used for the telemetry survey, Feb. 1975. Circles show location of caribou found; numbers refer to collar identification. All animals were marked at the Falcoz River (shown by square)

Figure 2
Aerial transects used for the telemetry survey, April 1975. Circles show location of caribou found; numbers refer to collar identification. All animals were marked at the Falcoz River (shown by square)

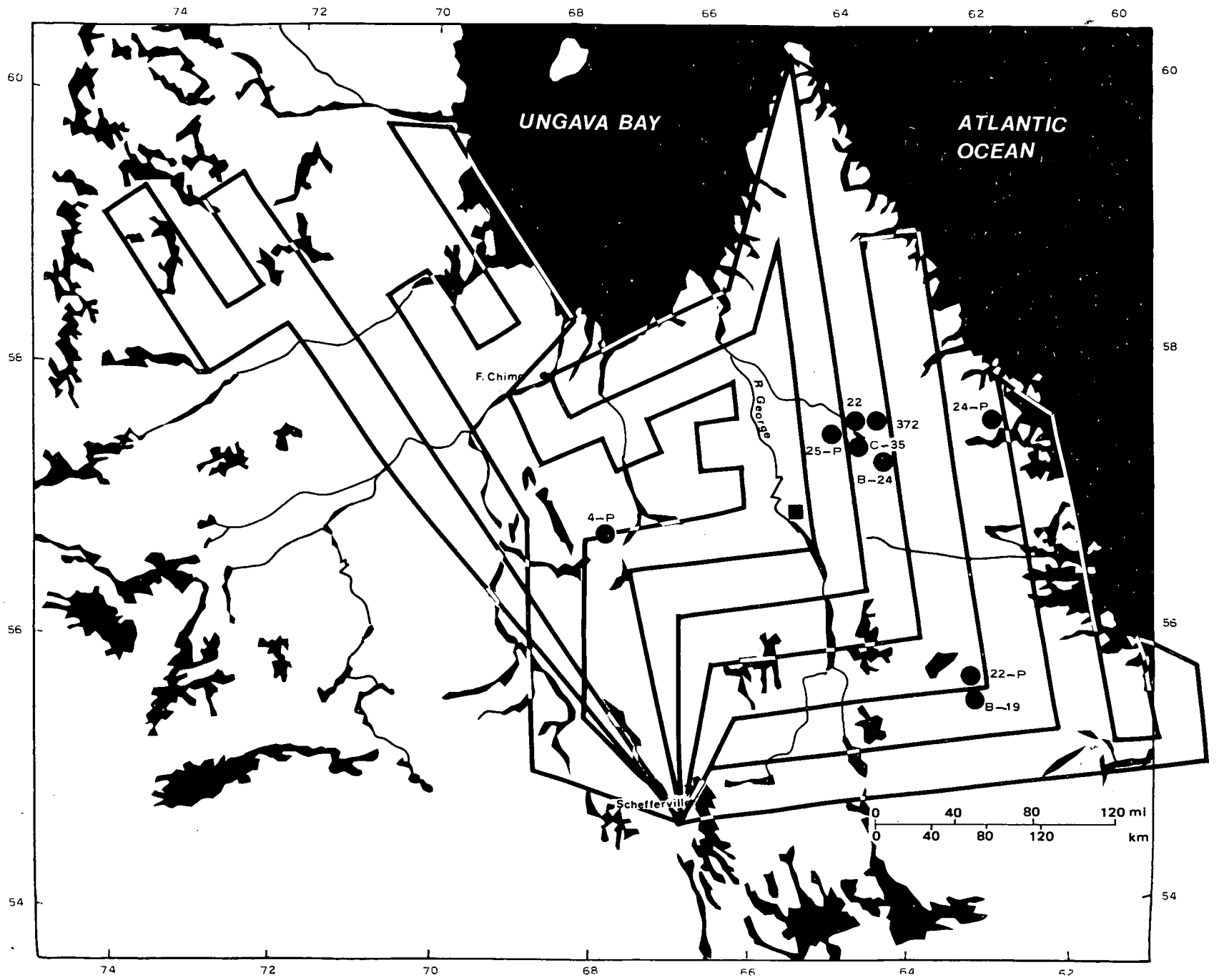

Figure 3
Aerial transects used for the telemetry survey, June 1975. Circles show location of caribou found; numbers refer to collar identification. All animals were marked at the Falcoz River (shown by square)

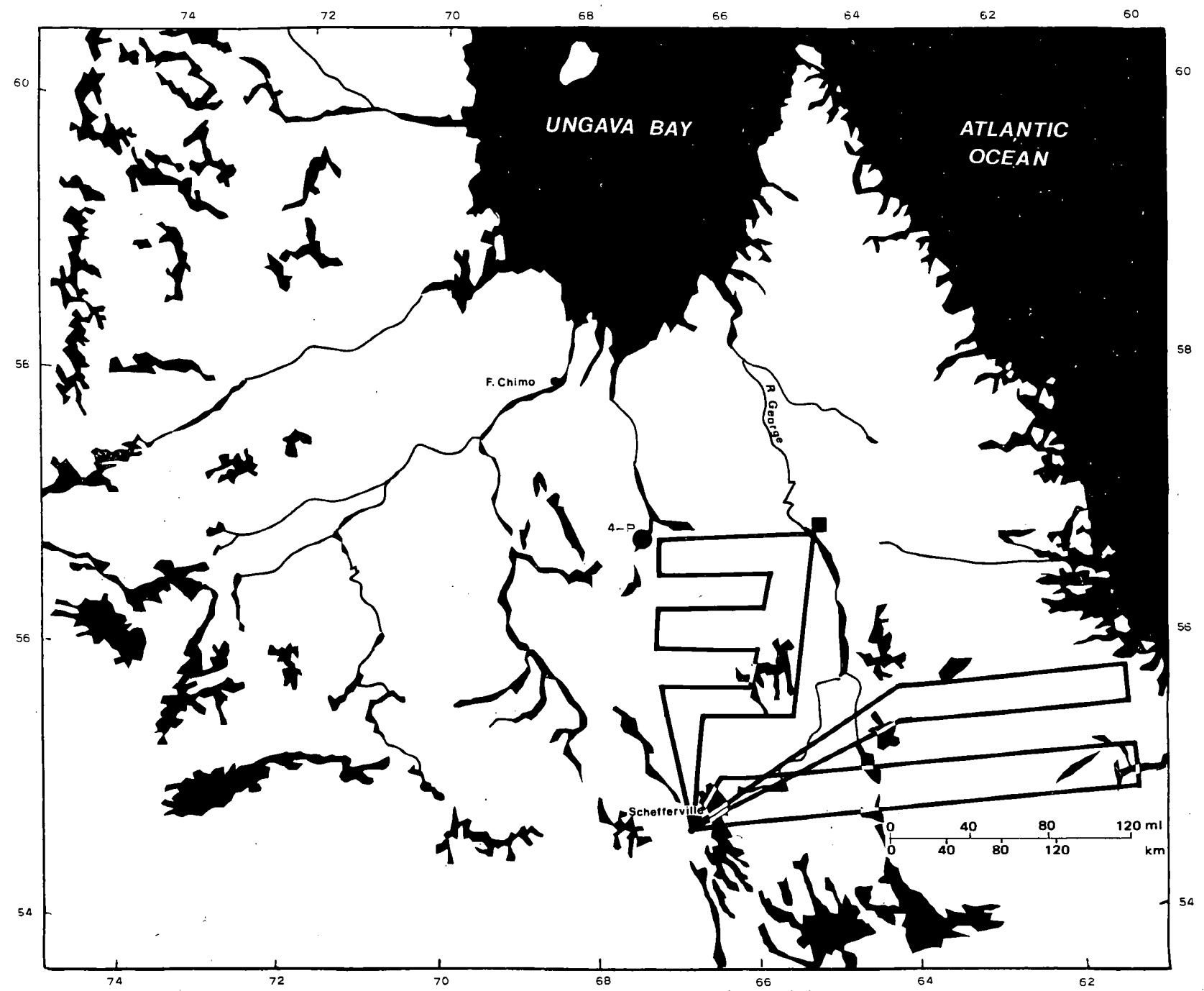

Figure 4
Distribution of 25 visual observations of collared caribou in Oct. (sites 1 and 2) and Nov. (sites 2–9) 1974. A5, 321, and 292 were killed by hunters. All animals were marked at the Falcoz River (shown by square)

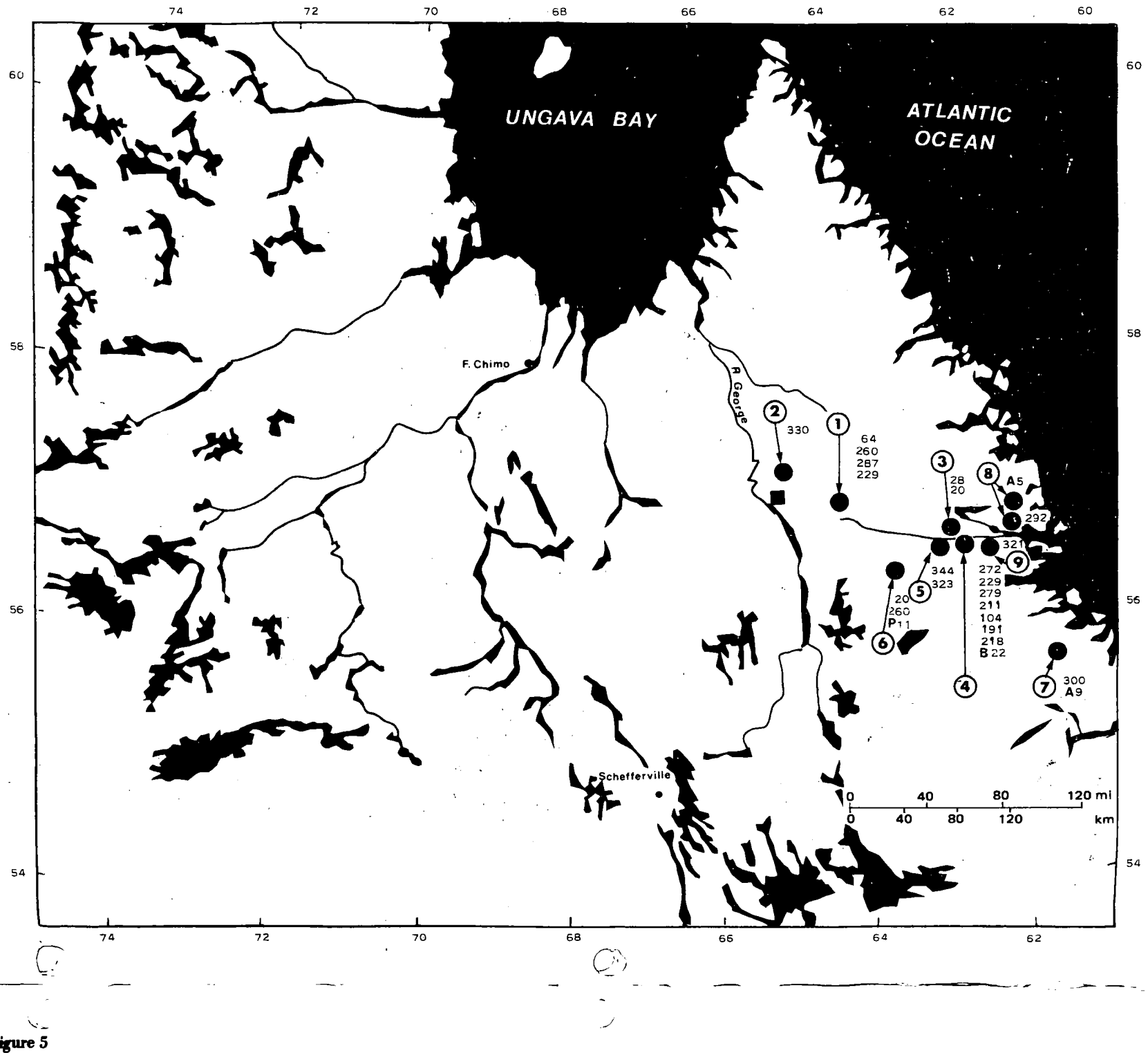

Figure 5
Movements of one marked female caribou during Oct.–Nov. 1974 and Nov. 1974–Feb. 1975. The square shows the marking site

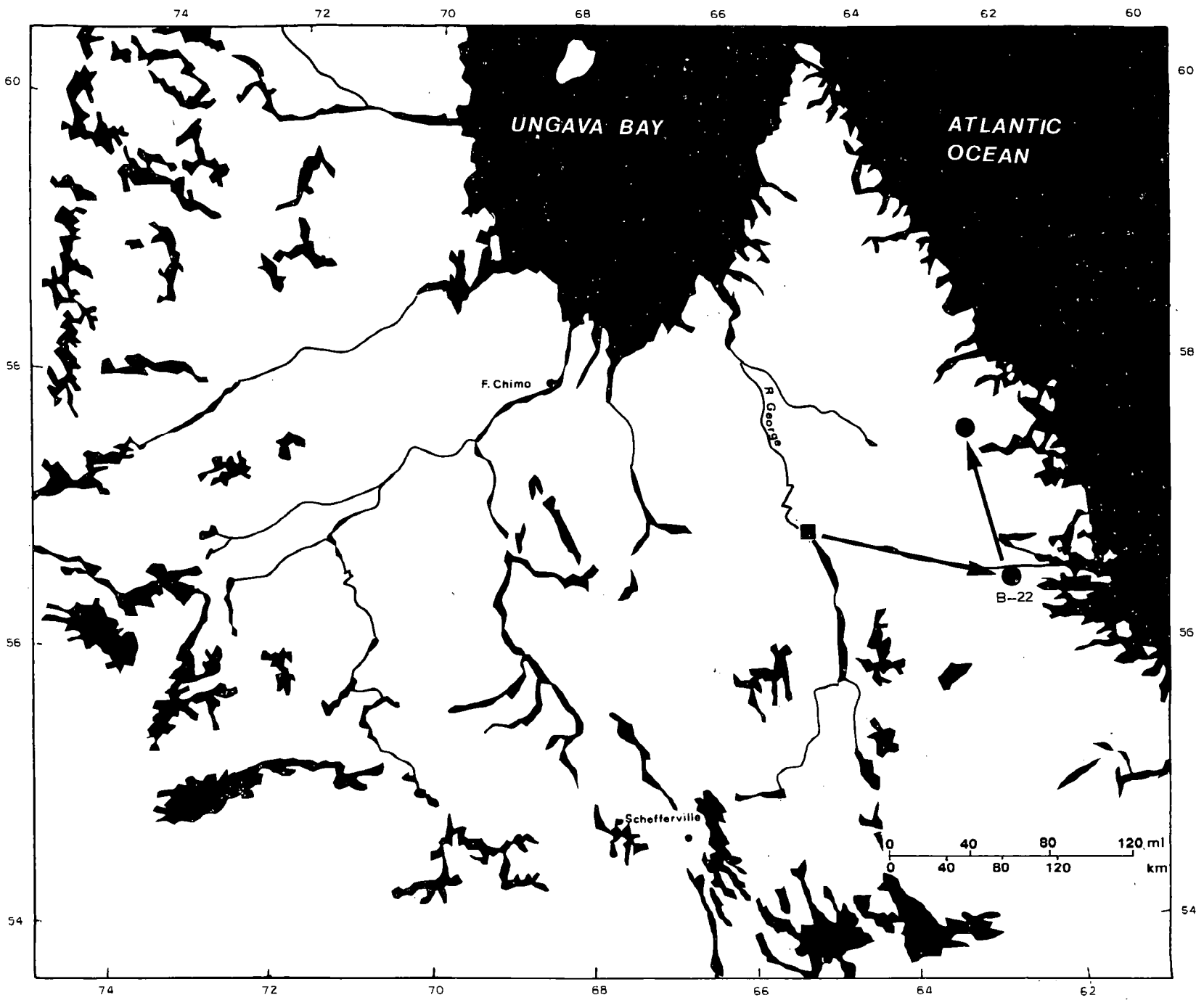

Figure 6
Movements of 25 female caribou (grouped in 9 observation sites) from the marking site (shown by square) in Oct. 1974, to visual observation sites in Oct. and Nov. 1974

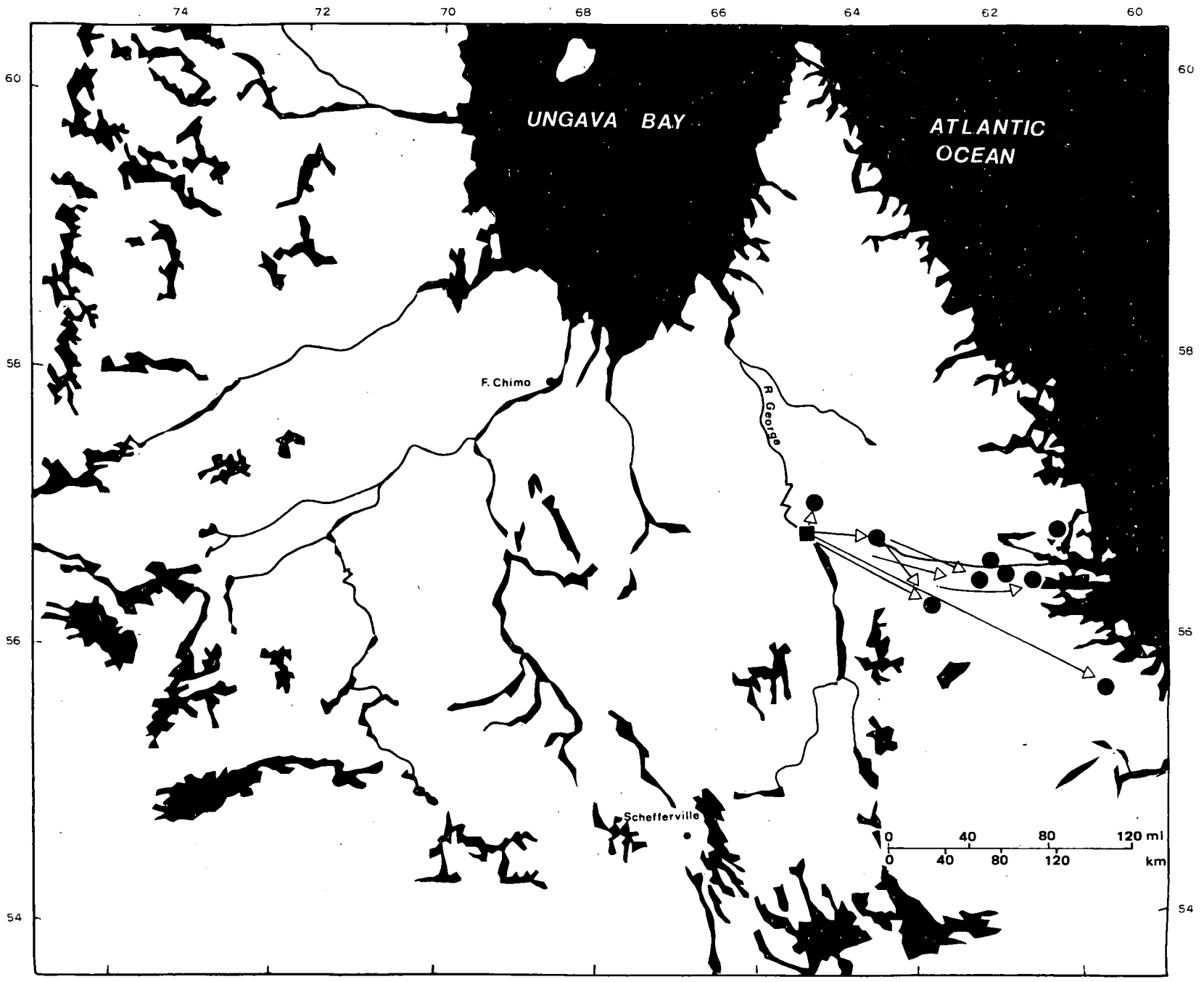

Figure 7
Movements of 9 marked caribou from the marking site (shown by square) in Oct. 1974 to their location in Feb. 1975

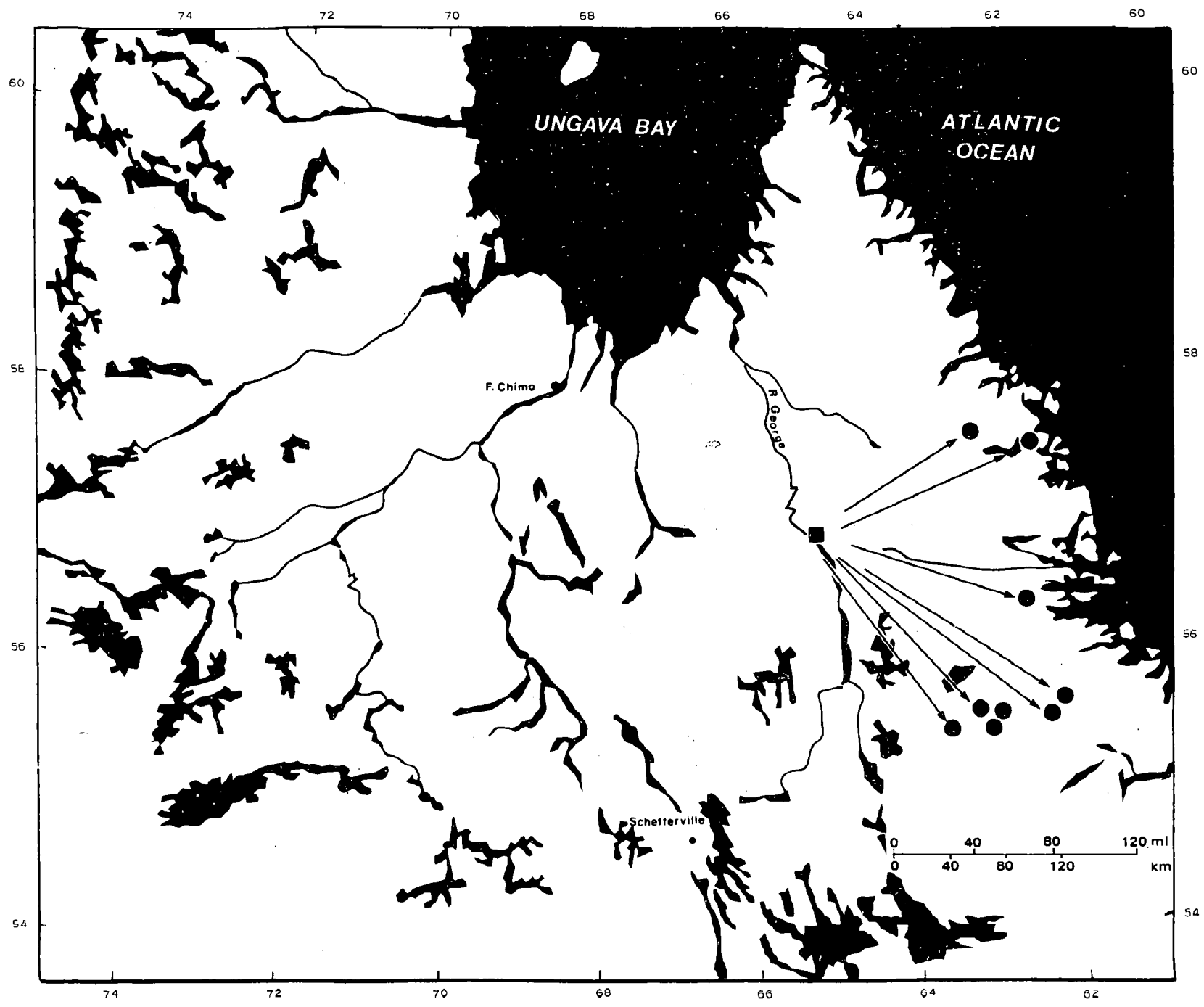

Figure 8
Movements of 4 marked caribou from their location in Feb. 1975 to their location in April 1975. The marking site is shown by a square

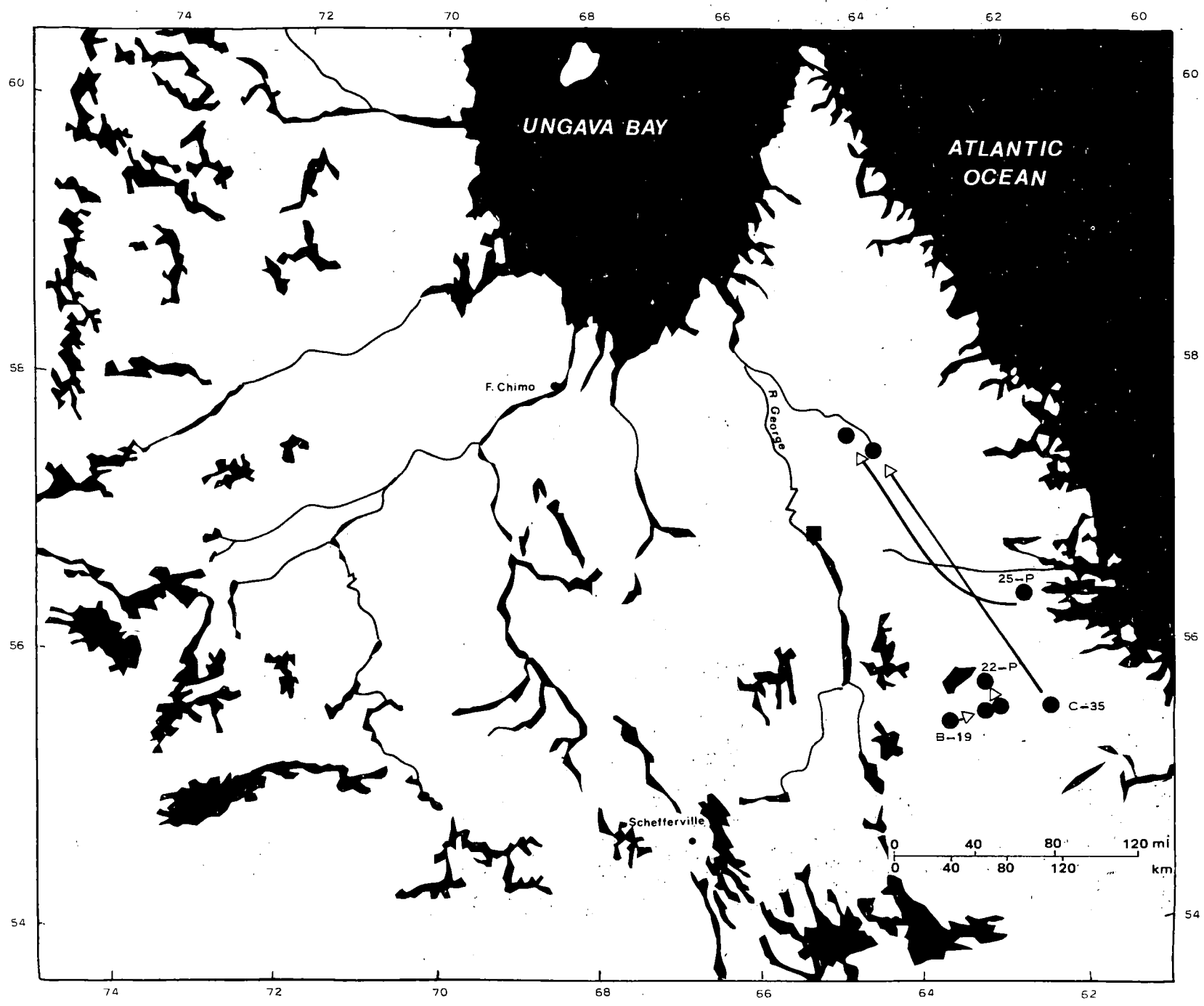

Figure 9
Distribution of 44 relocations determined visually and by telemetry from Oct. 1974 to June 1975 of the caribou marked in 1974 at the Falcoz River (shown by square)

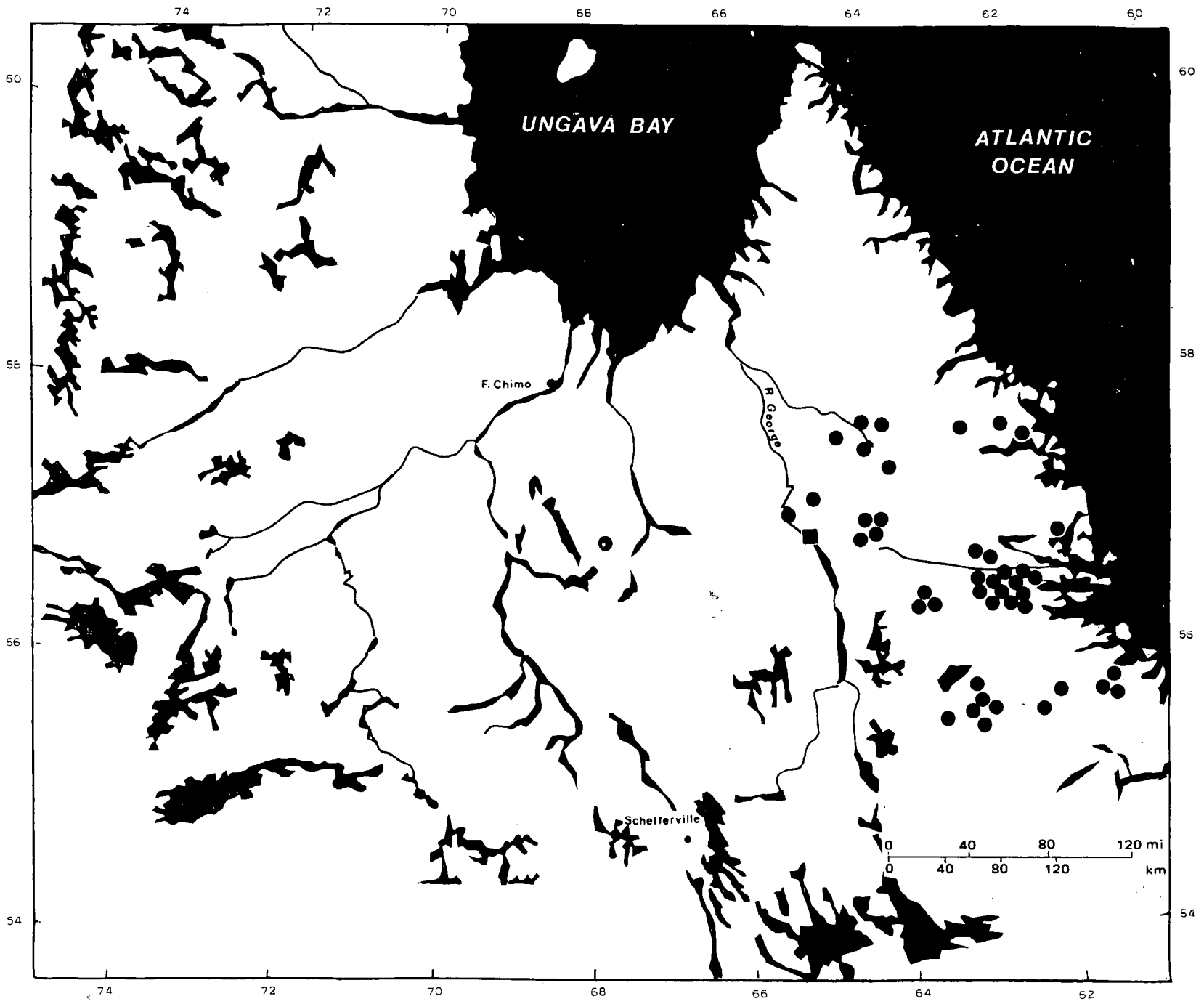

Figure 10
Aerial transects used for the telemetry survey, Oct. 1974, over Lake Caniapiscau