

HUNTING WILDLIFE AND WAGE EMPLOYMENT: RESOURCE USE STRATEGIES AT
FORT GEORGE, QUEBEC

CANADA COUNCIL RESEARCH GRANT S74-0456

"ANALYSIS OF THE USE OF SUBSISTENCE RESOURCES
BY THE NATIVE PEOPLE OF FORT GEORGE, QUEBEC"

by Harvey A. Feit
Visiting Assistant Professor
Department of Anthropology
McGill University

NOT FOR REPRODUCTION,
QUOTATION OR CITATION

The objective of this study was to develop and test a preliminary model of subsistence resource use by the native peoples of Fort George, Quebec. Previous studies at an inland Cree Indian community (Waswanipi) had indicated the resource use was related on one hand to the basic cultural beliefs of the population and, on the other hand, to two basic quantitative factors: the productivity of the animals and the cost (especially in time) of subsistence harvests. The study at Fort George was undertaken to examine these factors in a situation that differed significantly in two ways from that found in the previous studies. Firstly, several of the most important resources used at Fort George were migratory, and were only available for very limited periods, so that the pattern of availability of resources posed different problems for resource users. The second factor was the intensive involvement of the Fort George population in wage employment, which posed particular problems for the allocation of time between wage and subsistence activities. Fort George was a particularly opportune community for the study because earlier studies had indicated that despite the relatively large size of the community the native people here had successfully combined intensive involvement in wage employment and a relatively sedentary life style with intensive use of subsistence resources, a finding that needed explanation.

The development and testing of a model of wildlife resource use by the Native people of Fort George, involved several relatively discrete steps which are summarized below. Each point consists of a general discussion and underlined finding. The points are organized in three subsections with the main conclusions summarized at the end of each subsection.

A. Biological Evaluation of Resources and Harvests

1. Estimates of the standing crop (biomass), productivity (biomass per unit time) and potential sustainable yield of the main wildlife resources of the Fort George region were derived from the biological literature. Estimates of sustainable yields were derived for each major species or group of species, with the exception of porcupine. The estimated annual sustainable food yields from different resources measured in pounds of food for human consumption per year harvestable in the territory used by Fort George hunters are: big game (moose and caribou) - 18,000 pounds of food; beaver - 75,000; waterfowl (Canada geese) - 140,000; fish - 650,000; small game (hare) - 50,000 to 1,000,000 pounds of food per year.

2. Data on the size of subsistence harvests made by the Native people of Fort George during four different years from GCCQ and NHR studies were examined to determine the resources most important for subsistence: Canada goose (26.9 to 34.7 percent of the total annual food harvest); whitefish, including cisco (8.3 to 14.8 percent); beaver (7.2 to 8.2 percent); big game (0.9 to 4.1); and hare (1.0 to 22.1 percent).

3. An estimate of the ratio of the annual harvest of each species relative to the potential sustainable annual yield of that species was made in order to provide a gross measure of the relative intensity of use of various wildlife resources. Three levels of resource use intensity emerged. The harvests of waterfowl appear to be close to the harvestable yields, i.e. the ratio is close to 1. Estimated harvests of beaver and big game (moose and caribou) were approximately one-half the sustainable yield estimates (ratio .5). Estimated harvests of fish and hare were less than one-fifth estimated yeield estimates (ratios .2 and .16). Canada geese are the only resources presently used to near their biological limit, beaver and big game are estimated to be used at about half their potential yields, and fish and small game are used at less than half that level again.

4. The geographical distribution of the harvests of resources varies considerably and was examined to be able to relate this distribution to the impact of wage employment and sedentarization. No big game were caught, during the years for which there are data, within the zone near the settlement. The zone near the settlement is defined as the area which can be reached during one day return excursions from Fort George. In contrast to big game, over eighty percent of the hare harvest was made in this zone. Similarly three quarters of the whitefish, 65 percent of the spring geese and 55 percent of the fall geese were caught in the near the settlement zone. Only the geese are in fact distributed primarily in this area, the other resources are distributed widely over the entire region but are harvested more intensively in the zone near the settlement. Beaver and porcupine were caught predominantly away from the settlement 58 and 56 percent respectively. The majority of hare, whitefish and geese harvests occur in the geographical area accessible on day excursions from Fort George settlement, a majority of big game, beaver and porcupine harvests occur in geographical areas only accessible from bush camps established for harvesting purposes.

CONCLUSIONS OF BIOLOGICAL EVALUATION OF RESOURCES AND HARVESTS

- Intensity of resource use does not reflect the levels of biological yield.
- Some resources are harvested primarily in an area near the settlement, even though the majority of such resources occur widely throughout the territory.

B. Resource Use Models and Harvesting Efficiencies

5. Harvesting is conducted in traditionally defined sequence of seasonal activities, but the value of each activity and the intensity with which each activity is pursued varies from activity to activity according to tradition and in some cases according to the outcome of a previous or alternative activity. Fort George informants say the annual cycle is considered to begin with the spring goose hunt, from mid-April to mid-May, which they consider the most important activity of the year. The geese are followed by ducks and loon hunting and by a spring fishing period. In July and August the late spring activities may be continued - duck and loon hunting and fishing - but harvesting activities at this season may decline and are not so highly valued. In September and October the important fall goose hunt occurs, and an important fishing period follows. Highly valued winter hunting camp activities begin in early October or after Christmas, and involve fur bearer trapping, porcupine hunting, big game hunting and some small gaming. A winter under-ice fishery is common at the settlement and on the traplines in November and through the winter. From the settlement some small gaming and some trapping is possible in winter but they are not highly valued.

6. The reports on past harvesting indicated that certain wildlife resources have been used consistently over the past five or six decades, particularly waterfowl. For these resources there is no question that they will be used intensively each year. Describing their harvesting practices the hunters indicated that for these resources a strict regulation of harvesting activities was practiced, not to limit the harvest, but to maximize it in the long run by not shortening the period of waterfowl would stay in the area, nor scaring them away from areas where they could be easily hunted. The structure of decision-making in waterfowl hunting is critical because it indicated that the intensity with which this activity is practiced does not depend on the harvests of other resources. Waterfowl harvests in the spring and fall have therefore been the most regular recurring activities in the annual cycle of subsistence resource uses, and the ones that are always maximized

to the extent possible without reducing future opportunities for harvesting.

7. Informants reports indicated that historically fisheries harvests, responded to the level of need the fisherman perceived. If the spring goose harvest was high, spring fisheries catches might be lowered, and if the spring goose harvest was relatively low the spring fisheries were increased. Spring fisheries therefore responded to perceived need as affected by the success of the previous harvesting activity, rather than to availability of the resource. Summer fisheries were practiced to meet immediate needs. In the fall, the fisheries activity described was not limited by immediate need and there is reason to think that a link between the size of the goose harvest and the fall fisheries does not generally occur. The winter trapping period was perceived as the most difficult period for survival, and the fall fisheries were described as providing a storable resource that could help people through the mid-winter period. According to informants the fall fisheries have sometimes in the past meant the survival of the people through the winter. The fall fishery did not respond to the success of the immediately preceding goose hunt, but rather to the hunters expectations for the coming winter, and their capabilities for harvesting the fishery resource.

8. In the annual cycle model there are several strategies and types of linkages between successive activities. The spring and summer fisheries are regulated by immediate subsistence requirements. People work as hard at the summer fishery as they have to to produce a level of return they perceive as needed. Informants statements imply that this perceived level of return for the spring fishery, depends on the success of the previous goose hunt. The same linkage does not occur between spring fishing and summer fishing or between the latter and waterfowl hunting. This is partly because spring fishing is done to meet immediate need, so summer fishing is unaffected by surplus. In the case of the link between the summer fishery and the goose hunt the strategy of goose hunting is also critical. In both spring and fall, the strategy of goose hunting is to maximize the current harvests to the extent that long-term harvests are not endangered, so the intensity of goose hunting does not respond to the success of previous activities. The fall goose hunt is also not linked to succeeding activities in the same way the spring hunt is linked. In the fall attention is focussed on the upcoming difficult winter period, and whether the goose hunt is successful or not does not appear to directly change the intensity of fall fishing which is considered important in

many cases to provide security in the winter period. Two harvest strategies occur in the different harvesting activities during an annual cycle: a maximization of harvests to the maximum levels felt not to endanger future harvests; and, a harvest limited by perceived needs, immediate or proximate. Linkages between temporally sequential activities include complete separation of the activities, response in the later activity to the outcome of the former, and anticipation of future activities. The linkages are determined by a combination of traditional knowledge about how the cycle "fits together" and by the implications of the two harvest strategies that may be adopted.

9. During the winter harvesting period a large number of alternative activities are possible. A hunting group resource use model developed previously appears to apply, with modifications, to Fort George hunting groups and to data from neighboring communities (GCCQ data). The subsistence security level found in subarctic studies is roughly two to three pounds of food per adult consumption unit per day. In Fort George hunting groups, when beaver plus big game plus porcupine provide more than three pounds of food per adult consumption unit per day, then fish and small game resources are relatively little used and usually account for less than 20 percent of the total food harvest. However, when beaver plus big game plus porcupine provide less than three pounds of food then small game and fish are more intensively used, in general, and may account for over one-third of the total harvest. Using efficiency data from other regions we hypothesize that during the winter trapping period the more efficiently harvestable resources are being used first and the less efficiently harvestable resources are only used when the preferred resources do not provide adequate food for subsistence security.

10. Data provided by the GCCQ on a limited number of trappers indicates that costs for each goose hunting season total about \$335 whereas costs for the winter trapping season average about \$1050. This amounts to a cost per pound of food harvested of \$1.25 per pound of goose in the spring; \$1.04 per pound of goose in the fall; and \$0.67 per pound of food at winter hunting camps. The key point however is that participation in winter hunting camp trapping requires, on average, a large cash outlay. A major part of this cash outlay, 25 percent on average, is for transportation, and the more distant the trapline, the higher the cost. This results in an observed patterns of less intensive use of more distant traplines. About one-third of the traplines are unused each year. This pattern explains most

of the under-utilization of big game and beaver. These resources are widely distributed over the area of the traplines, and the costs of using more distant traplines effectively prevent regular annual harvesting of these resources on one-third of the productive land. A part of the under-utilization of fishery and small game resources is also explained by this geographical distribution of winter hunting groups and the rest is explained by the resource use models.

11. Estimates, from data in the literature, of the relative efficiency of the most important harvesting activities during each of the various seasonal periods indicate that over the entire year goose hunting provides the highest return of all activities, 8.8 to 14.1 lbs. of food per man-day of harvesting (NHR), depending on the year. There is however a large difference between spring and fall efficiencies. In spring 7.3 to 8.7 lbs. are harvested per man-day, in fall 10.8 to 20.2 lbs. per man-day. In comparison fisheries provide 7.6 (NHR) or 7.2 (Berkes) lbs. per man-day over the course of the year. In the spring fisheries provide 8.1 (NHR) or 7.2 (Berkes) lbs. per man-day. In summer-fall the fisheries harvest efficiency declines to 6.4 (NHR) or 5.5 (Berkes) pounds per man-day, but even within this period there are important variations. Mid-summer fisheries harvest efficiencies are only 3.3 (Berkes) lbs. per man-day, whereas fall harvests are 9.11 (Berkes) lbs. per man-day. The winter hunting camp trapping period includes a wide range of activities, including beaver trapping, porcupine hunting, fall and under-ice fishing, big game hunting and small gaming. In total, the winter hunting camp period provides 12.8 (GCCQ) lbs. of food per man-day of harvesting, but it must be noted that informants point out that winter hunting and trapping are more physically demanding activities than fishing in open waters or waterfowl hunting. Thus while harvests per man-day are high in winter, it is estimated that the more intensive work involved lower harvests per unit effort to the equivalent of one-half of the actual pounds of harvest per man-day values, i.e. 6.4 lbs per man-day, or somewhat less than spring and fall harvesting activities. In addition, the isolation and uncertainty of winter harvests make winter the most difficult and dangerous period in the view of the hunters. Goose hunting is therefore the most productive harvesting activity on an annual basis, and is also the most productive activity practiced during the spring and the fall periods. Fishing is always less productive than goose hunting. Winter hunting camp harvesting while productive on a man-day basis, is probably less efficient than spring and fall fishing and goose hunting on a harvest per unit effort basis. In general peak

efficiencies occur in the fall, followed by spring, winter and mid-summer.

CONCLUSIONS OF RESOURCE USE MODELS AND HARVESTING EFFICIENCIES

- A model of the "annual cycle of resource use" and of the harvesting strategies that apply to various activities can be developed on the basis of hunters statements about their own activities (ethno-models). Two different strategies for harvesting particular resources at different seasons were defined.
- A model of "hunting group resource use" can be developed consistent with Fort George hunters accounts of winter harvesting activities.
- Each of these models is based on two basic principles: 1. that the more efficiently harvestable resources are preferred and are harvested to the limits possible without endangering future harvests; 2. that less efficiently harvestable resources are only used to meet perceived needs that arise either because of a short-fall in preferred harvests, or because no more efficiently harvestable resource is available at that season.
- The quantitative data available on actual Fort George harvesting activities, particularly on the efficiency and intensity of use of the different resources is consistent with these models and principles.
- The two principles cited above, were developed for a model of hunting group resource use by the Waswanipi Cree and apply equally to hunting group resource use decisions and to annual cycle resource use decisions of the Fort George Cree. These principles may be more generally applicable to the subarctic subsistence hunters.

C. Relationship of Wage Employment to Subsistence Production

12. Wage employment is an important source of cash incomes to the Fort George economy. It provides 62 percent of the total cash income of the community and nearly twice as much cash income as transfer payments (GCCQ data). Wage employment income is critical even for families who intensively engage in subsistence harvesting, because they have to meet the high cash costs of winter harvesting. It is primarily men of retirement age who do not seek any work at all during the year. There is a positive relationship between employment income and total subsistence production of a hunter (measured as pounds of food per hunter per year) up to incomes of approximately \$3000. Above this income subsistence production declines, but only modestly, because the time commitment to wage labor

begins to conflict with subsistence activities.

13. The key to the positive relationship between limited wage labor and subsistence production is the scheduling of wage employment. Men who take part-time work only during the summer period range up to approximately \$2000 to \$3000 employment income per year, and harvest an average of 1760 pounds of food per year, which should be enough to meet most of the food needs of themselves and their families.

14. The key to the limited conflict between intensive wage labor and subsistence production is the use of the migratory resources and the resources with high biological yields available near the settlement. Men who work full-time all year have average cash incomes over \$6000 per year, and are able to harvest almost two-thirds as much as the men who work summer only; they average 1146 pounds of food per year. The men who work full-time all year harvest fewer of the resources that are primarily harvested from winter hunting camps (beaver, porcupine and big game) because employment in the settlement conflicts with long stays in the winter hunting camps. They must choose between wage employment and full-time winter harvesting. These men however are able to maintain per hunter harvests of geese, most fish and most small game similar to those of men who only work summers. This is because they take holidays for the goose hunts, and because fishing and small gaming can be done around the settlements in evenings, on weekends and by wives and children.

15. Men who work part-time all year round fall in between those with full-time jobs and those who work summer only. They have intermediate incomes and their subsistence food production is 89 percent of that of the men who work summers only. On a per hunter basis they harvest fewer beaver and big game, for the same reasons as do the men who work full-time all year. However, in contrast to the men who work full-time all year they harvest more fish, small game, porcupine and seal than do men who work summers only. Waterfowl harvests remain the same. Geese are primarily harvested during brief periods of the year and are the only resource harvested intensively by hunters with all intensities of involvement in wage employment. Relative to men who work summers only and who tend to be widely distributed geographically in winter, men who work all year and therefore have to harvest close to the settlement all year, harvest more intensively those species that have higher biological yields and are therefore available near the settlement because they are less easily depleted by intensive use. These, however, are the species that are least efficiently harvestable and it is only the men with

part-time jobs all year who can harvest them intensively, men with full-time jobs do not have particularly high harvests of these species, presumably because they do not have sufficient time to harvest them.

CONCLUSIONS ON THE RELATIONSHIP OF WAGE EMPLOYMENT AND SUBSISTENCE PRODUCTION

- Wage employment all year conflicts with certain seasonal activities in the annual cycle of harvesting activities, but seasonally selected wage employment provides the cash income needed to pursue these activities and increases subsistence production.
- Wage employment all year reduces total per hunter subsistence food production because harvesting is concentrated in the region around the settlement where most of the resources available are less efficiently harvestable than the resources available away from the settlement. But, when employment is part-time there is sufficient time to make more intensive use of the resources in the "near the settlement" area even though they are not efficiently harvestable.
- With a resource that is relatively productive, and efficiently harvestable available relatively close to the settlement and with other relatively productive resources also available in the area around the settlement, men who choose to allocate time to wage employment on an annual basis may be able to maintain most of the quantity of their subsistence food production while increasing their cash incomes significantly.