RESIDENT HUNTER HARVEST STUDY

SUMMARY REPORT

NORTHWEST TERRITORIES

1988/89

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DEPARTMENT OF RENEWABLE RESOURCES

GOVERNMENT OF THE NWT

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ABSTRACT

A resident big game hunter survey was begun in 1981, and has been conducted annually since that time. Questionnaires for the 1988/89 harvest year were sent to the 1975 resident big game hunters in July, 1989. Two additional questionnaires were mailed to hunters who did not respond to earlier mailings. Unopened postal returns were received for 237 (12%) of the hunters and 1223 (61.9%) of the hunters returned their questionnaire.

Barren ground caribou, moose, and woodland caribou, in decreasing order of magnitude, were the three most frequently harvested big game species. In all three cases, bulls were preferred, accounting for more than 60% of the harvest. Reported barren ground caribou harvest was 1174. Estimated caribou kill, using ratio and linear regression methods, respectively, was 1882 or 1903. An estimated 104 moose and 80 woodland caribou were harvested.

Dall's sheep harvest was estimated to be 17 animals. Of the 11 reported kills, 10 were full-curls and one was a 3/4 curl.

Reported black bear harvest was 12 animals, with a total estimated harvest of 21 bears.

Reported harvest only is available for furbearers, waterfowl and upland gamebirds taken by big game resident hunters. Nineteen (19) wolf and 4 wolverine were reported killed.

One hundred and thirty-three (133) big game hunters reported a harvest of 1253 waterfowl. Over 10000 upland gamebirds were reported harvested by resident big game hunters. The proportion of grouse and ptarmigan was almost equal, with 5123 grouse and 5233 ptarmigan killed.

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INTRODUCTION

The ability to make wildlife management decisions is dependent upon access to reliable estimates of mortality, recruitment and current population levels for a given species. One objective of the resident hunter survey is to provide a reliable estimate of harvest for a number of species taken by resident big game hunters, and where possible to extrapolate those values to total estimated harvest by resident hunters.

In addition to providing estimates of harvest for each region in the Northwest Territories, the data may indicate changes in harvesting trends and allow for comparison of hunting patterns among, and within, Wildlife Management Zones (WMZ), regions, seasons and years. The data will also be available for assessing the economic importance of big game species to residents of the Northwest Territories (NWT).

On an annual basis, since 1981, resident hunters who purchased a big game species licence have been sent harvest questionnaires by the Wildlife Management Division, Department of Renewable Resources, Government of the Northwest Territories (GNWT). The initial 1980/81 season questionnaire was sent only to those hunters living in the Fort Smith and Inuvik regions (Figure 1). Harvest information for the 1981/82 hunting season was gathered by sampling hunters from all regions in the NWT. Since 1983, the questionnaire has been sent to all hunters who purchase a big game licence.

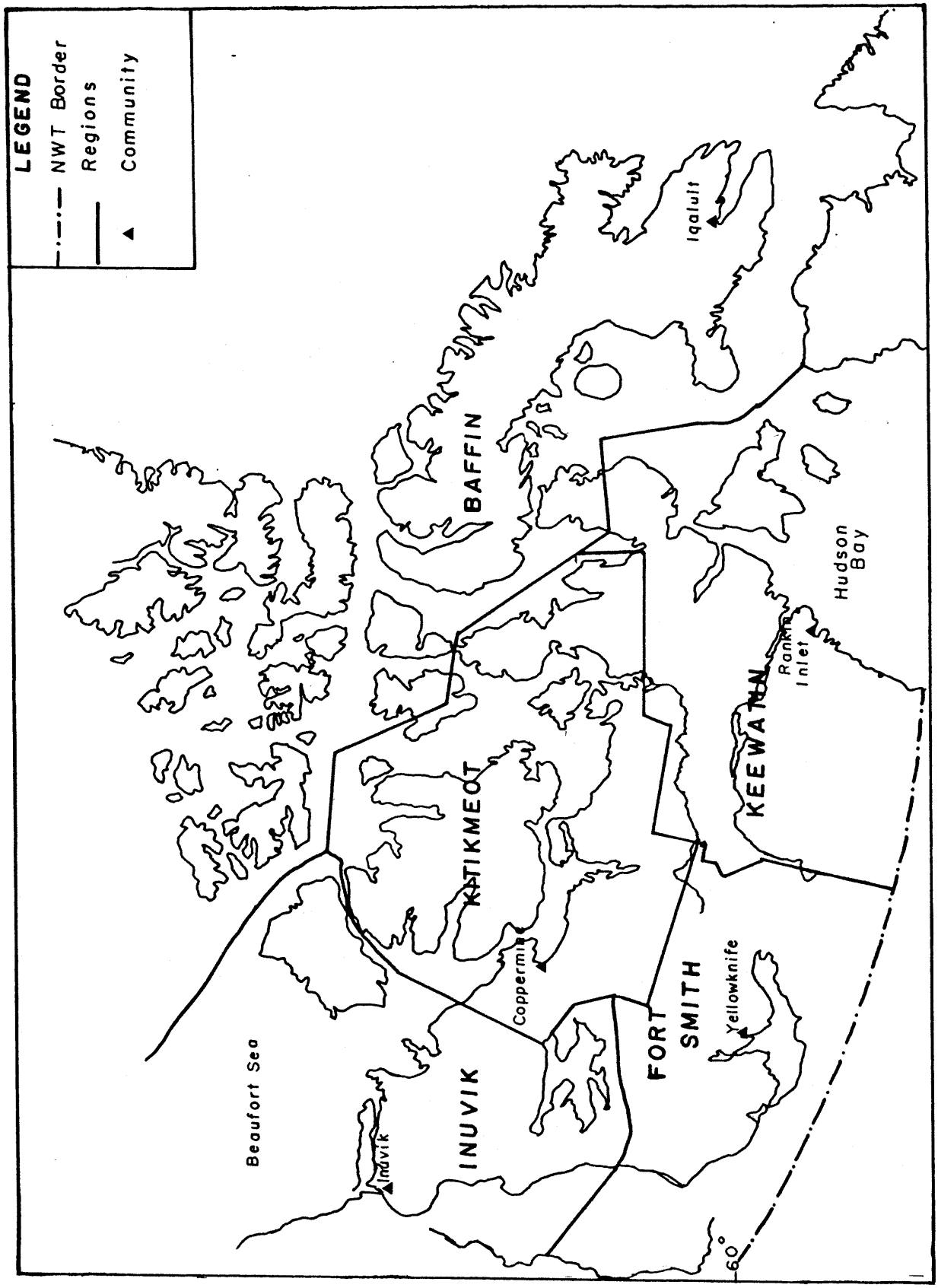

Figure 1. Regions in the Northwest Territories.

Questionnaire design has been determined to be the most important factor in achieving good mail survey results (Filion 1978). The original questionnaire design conformed to guidelines presented by other researchers (Filion 1978, 1981), and only minor refinement has occurred over the years. Though design affects both the level of response and the values given by respondents (Filion 1981), changes to the questionnaire or cover letters have been minimal and should not affect between year comparisons of data. In all years, questionnaires have requested information pertaining to hunts for the following big game species; barren ground caribou (Rangifer tarandus groenlandicus), woodland caribou (Rangifer tarandus caribou), black bear (Ursus americanus), moose (Alces alces), Dall's sheep (Ovis dalli) and mountain goat (Oreamus americanus). In most years, hunt information was also sought for upland gamebirds killed by persons who purchased a big game licence, and for two furbearer species, wolf (Canis lupus) and wolverine (Gulo gulo).

There are four big game sport species which are under the mandate of the Department of Renewable Resources but which are not included on the hunter questionnaire. Grizzly bear, polar bear, muskoxen and bison harvest are monitored through other programs.

METHODS

At the end of the 1988/89 hunting season, records of all residents who purchased either a caribou, black bear, mountain goat, Dall's sheep or moose tag were copied from the Finance and Administration Division vendor sales database to the resident hunter database in the Wildlife Division. The number of gamebird licenses sold to NWT resident hunters, as well as total number of persons paying fees to harvest wolves or a wolverine, was provided by Finance and Administration and Small Systems at a later date.

In mid-July, 1989, a letter and questionnaire were sent to each hunter who had purchased a big game licence during the 1988/89 hunting season, i.e., between July 1, 1988 and June 30, 1989. Two months following the "first wave" mailing, a second letter and questionnaire were sent to each person for whom a returned questionnaire or postal returned letter had not yet been received. Approximately two months after the "second wave" mailing, a third and final mailing was made to the remaining non-respondents.

Hunters were asked for the number of days spent hunting and location of the hunt, as well as for kill information where applicable. Hunters were asked to complete the form even if they hunted and were unsuccessful, or did not hunt. A copy of the original 8 1/2" X 14 1/2" questionnaire and the cover letters issued with each wave of mailings are provided (Appendix A).

Questionnaires returned after January 30, 1990 were not included in the results.

Residents of Yellowknife were categorized into a separate region, region 6, from other persons residing in the Fort Smith region, due to the large number of hunters residing in the city.

The ratio method was used to estimate total big game harvest by resident hunters, from the reported harvest. This method assumes non-respondents and non-deliverables have the same success as respondents (Hawn and Ryel 1969). Barren ground caribou harvest was also estimated using simple linear regression (Appendix B). This second method recognizes that persons responding to successive waves do behave differently, and attempts to weight against this bias. At least three waves of mailings and a response of 60% is recommended for this calculation (Filion 1980). Non-respondents may differ from late respondents and affect trends, but this is not likely to occur where a 70% response rate is achieved (Filion 1976).

Due to lack of information regarding licence purchases for wolf, wolverine, upland gamebirds or waterfowl, no attempt was made to estimate total harvest for those species.

RESULTS AND DISCUSSION

Tag Sales

With the exception of barren ground caribou, the number of big game tags sold for all species declined between 1987/88 and the 1988/89 season. There was tag sale reduction of 4% for moose, 4.6% for woodland caribou, 14.8% for sheep, 7.8% for black bear and 40% for mountain goat.

Unlike the other big game species, each resident hunter can harvest up to five barren ground caribou (except in Wildlife Management Zones A/1 and B/1, where a bag limit of 2 caribou is in place) as long as he/she holds five tags. For all other big game species only one animal can be killed by any one licence holder for a given year. In 1988/89, 1330 people purchased 4126 barren ground caribou tags, for an average purchase of 3.1 tags per hunter. In the 1987 harvest year 3947 tags were purchased by 1282 hunters for a mean purchase of 3.1 tags (Chalmers in prep.). One hundred and ninety-nine (15%) people bought 1 caribou tag, 392 (29.5%) bought 2 tags, 247 (18.6%) bought 3 tags, 58 (4.4%) bought 4 tags and 431 (32.5%) purchased 5 tags.

An unlimited number of wolves can be taken by each licence holder who paid a wolf fee and one wolverine kill is allowed per hunter. In 1988/89, 238 big game hunters each purchased a licence to harvest wolves, 68 of whom also bought a wolverine licence. Two hunters purchased a wolverine licence only. In the previous year,

1987/88, the same number of hunters purchased a wolf licence and 63 people bought wolverine licences.

Total number of gamebird licences sold in the NWT was 2671, 2148 of which were held by residents of the NWT. Of those residents, 20.2% held a small game licence only and 1714 (79.8%) also held a big game licence (B. Sherren pers. comm.). Non-residents and non-resident aliens purchased 355 and 168 gamebird licences respectively (B. Sherren pers. comm.). In 1987, 3520 gamebird licences were purchased, 1738 (49.4%) of which were held by NWT resident big game hunters.

Waterfowl licences were purchased in the NWT by 516 Canadian residents, 470 of whom resided in the NWT (Canada, Canadian Wildlife Service 1989). Number of licences sold to NWT residents in 1987/88 was 509 (Dickson 1989).

Returns

Of the 1975 hunters who where sent the 1988/89 questionnaire, unopened postal envelopes were returned for 237 (12%) of the hunters. Of the remaining 1738 hunters, 1223 (70.4%) responded, for an overall response rate of 61.9%. There were 515 (29.6%) people who received the questionnaire but did not respond, compared with a non-respondent rate of 14% in 1987, when an overall response rate of 76% was achieved (Chalmers in prep.).

Of the 1330 hunters who purchased a barren ground caribou tag,

2568 tags were accounted for by hunters who responded to the survey (Table 1). Of those hunters, 63.8% responded to the first wave of mailing, 17.7% responded to the second wave, and 4.8% responded to the third wave. In 1988, only 52.2% of the response occurred as a result of the first wave. The changes made to the questionnaire and cover letters may have caused this greater response. The questionnaire was less cluttered-looking and the cover letters provided examples on how to complete the questionnaire. "Hard core" non-respondents (those requiring more than one questionnaire before replying) did not seem affected by changes in the questionnaire. It is possible that these individuals answer more from a sense of being harassed by successive mailings than from a strong sense of duty. A response rate of 79% was achieved by Filion, who mailed questionnaires at 4 week intervals (Filion 1976), and in a study where questionnaires where mailed at 3 and 6 week intervals, a 78% response was achieved (Atwood 1956). In 1987, and in years previous to that, only six weeks lapsed between mailings, but mailings of successive waves in the 1988/89 survey was two months.

There were 300 hunters, compared with 292 people in the previous year, who purchased a barren ground caribou tag, and returned a questionnaire, but provided no hunt information. These hunters may have neglected to complete the questionnaire, or may not have hunted. The present database does not allow for such distinction to be made.

Table 1. Total tags purchased and tags accounted for by each wave of respondents, 1988/89.

REGION	BARREN GROUND CARIBOU	WOODLAND CARIBOU	MOOSE	BLACK BEAR	MTN. GOAT	DALL'S SHEEP
Fort Smith						
wave 1	157	107	171	39	1	8
wave 2	62	61	82	24	0	2
wave 3	9	25	37	6	0	2
Total return	228	193	290	69	1	12
Total purchase	354	313	463	112	3	19
Inuvik						
wave 1	186	32	67	15	0	18
wave 2	83	10	23	5	0	6
wave 3	15	5	6	2	0	5
Total return	284	47	96	22	0	29
Total purchase	414	70	143	34	0	41
Kitikmeot						
wave 1	57	1	2	0	0	1
wave 2	24	0	1	0	0	0
wave 3	3	0	0	0	0	0
Total return	84	1	3	0	0	1
Total purchase	114	1	3	0	0	1
Keewatin						
wave 1	76	0	0	0	0	0
wave 2	37	0	0	0	0	0
wave 3	7	0	0	0	0	0
Total return	120	0	0	0	0	0
Total purchase	202	0	0	0	0	0
Baffin						
wave 1	152	1	1	0	0	1
wave 2	58	0	0	0	0	0
wave 3	20	0	0	0	0	0
Total return	230	1	1	0	0	1
Total purchase	334	1	2	0	0	1
Yellowknife						
wave 1	1013	139	249	65	0	4
wave 2	465	70	132	36	1	0
wave 3	144	26	46	15	0	0
Total return	1622	235	427	116	1	4
Total purchase	2708	420	717	207	3	9
GRAND TOTAL RETURNS	2568	477	817	207	2	47
GRAND TOTAL PURCHASE	4126	805	1328	353	6	71

Harvest

The most frequently killed big game species was barren ground caribou, followed by moose, woodland caribou and Dall's sheep (Table 2). The least harvested species was mountain goat with no reported kill.

Barren ground caribou

The 1223 respondents had a total reported kill of 1174 barren ground caribou for a mean kill of 1.0 caribou each (Table 2). The average kill for each of the 494 respondents who actually reported hunting caribou was 2.3 caribou. In 1987/88, success for respondents reporting having hunted caribou was 2.7 animals. One hunter claimed a harvest in excess of the allowable 5 bag limit and reported taking 15 caribou, comprising 8 bulls, 5 cows, and 2 juveniles.

According to questionnaire returns, hunters hunted a minimum of 1 day, and a maximum of 45 days, with an average of 2 days per hunter. More bulls than cows were reported harvested, with 62.2% of the harvest comprising bulls and 32% comprising cows.

The WMZ kill location is known for all but 10 hunters. A reported 999 (55.9%) barren ground caribou hunts took place in WMZ F-1 (Figure 2). The second most hunted WMZ was F-2 with 8.8% of the hunters reporting hunts there.

The estimated kill was 1882 or 1903 caribou as determined by the ratio method and regression analysis, respectively (Table 3).

Table 2. Reported resident hunter big game harvest, NWT, 1988/89.

REGION	BARREN GROUND CARIBOU	WOODLAND CARIBOU	MOOSE	DALL'S SHEEP	MTN. GOAT	BLACK BEAR
Ft. Smith	130	20	45	6	0	8
Inuvik	116	8	16	5	0	1
Kitikmeot	50	1	1	0	0	0
Keewatin	64	0	0	0	0	0
Baffin	116	0	0	0	0	0
Yellowknife	698	13	43	0	0	3
TOTAL	1174	42	105	11	0	12

The number of caribou taken in 1988/89 was less than that taken the previous year (2241). The 1987/88 estimated harvest, and reported success rate of hunters was likely higher due to the geographical location of the caribou in that year when the Bathurst caribou herd wintered close to the City of Yellowknife (Chalmers in prep.).

Woodland Caribou

The reported caribou harvest by the 477 hunters who purchased tags was 42 animals. Of these, 59.5% were bulls, 33.3% were cows and 7.1% were juveniles. Estimated harvest for big game hunters is 79.9 animals (Table 3). The average number of hunt days for this species was 4, with a range between 1 day and 135 days.

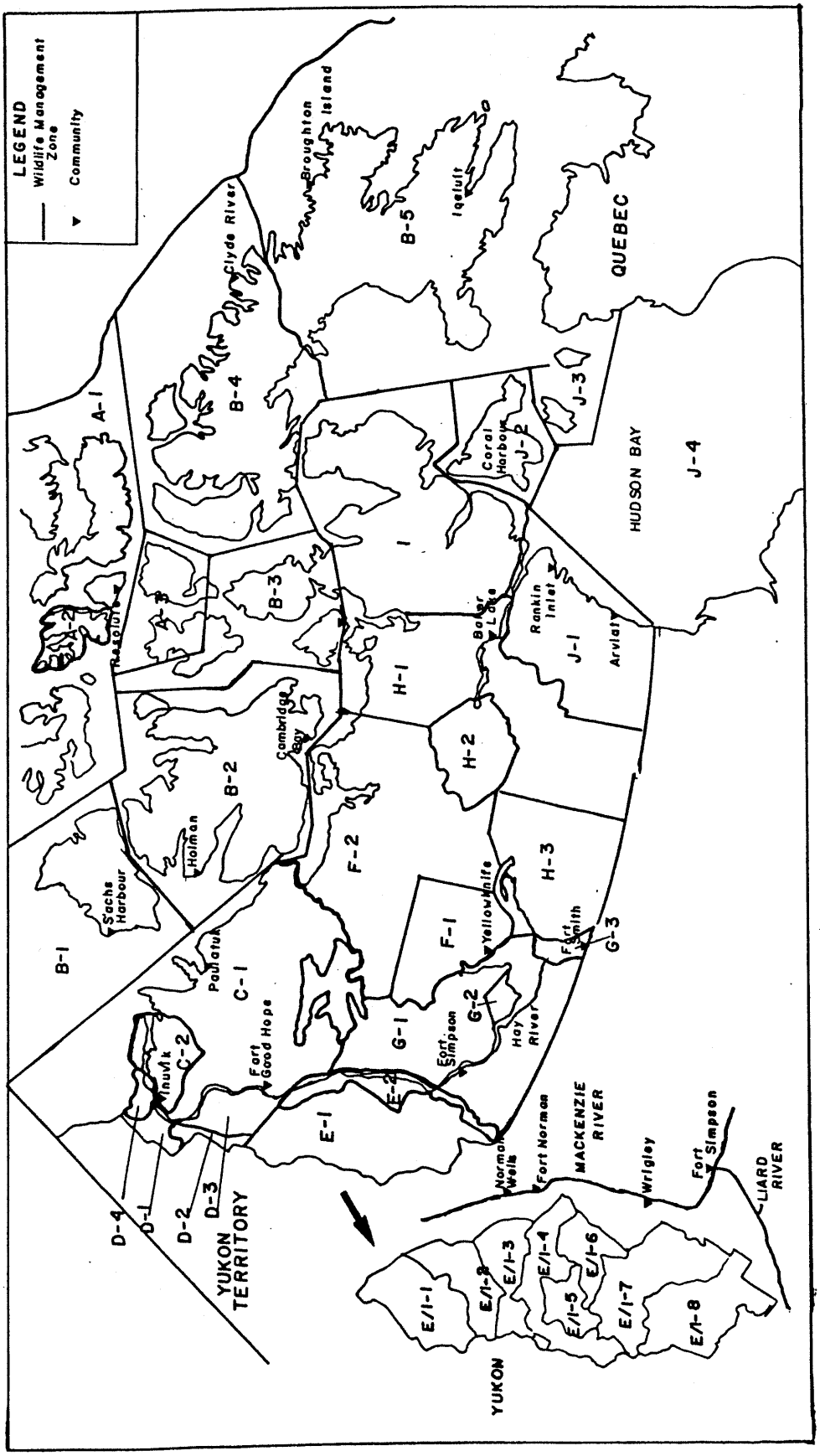

Figure 2. Wildlife Management Zones in the Northwest Territories.

Table 3. Estimated big game harvest by resident hunters, NWT, 1988/89.

REGION	*BARREN GROUND CARIBOU	WOODLAND CARIBOU	MOOSE	DALL'S SHEEP	MTN. GOAT	BLACK BEAR
Ft. Smith	201.8 (197)	32.6	72.1	9.5	0	14.1
Inuvik	169.3 (174)	11.9	23.8	7.1	0	1.5
Kitikmeot	67.8 (68)	1	1	0	0	0
Keewatin	107.4 (111)	0	0	0	0	0
Baffin	168.4 (173)	0	0	0	0	0
Yellowknife	1167 (1180)	34.4	72.5	0	0	5.3
TOTAL	1882 (1903)	79.9	169.4	16.6	0	20.9

*Ratio (and Linear Regression) Method

Moose

Reported moose kill was 104 animals, composed of 65 (62.5%) bulls, 32 cows, and 7 juveniles. Two hunters reported harvesting more than the allowable limit of one animal. One hunter reported killing a cow and a juvenile, and the other reported taking 1 bull and 3 cows.

Estimated harvest was 169.3 animals, with 86% of the harvest divided equally between Fort Smith and Yellowknife hunters (Table 3). Estimated moose harvest in 1987/88 was 209 animals, with a mean kill of 0.10 moose per big game hunter compared to 0.09 moose per hunter in 1988.

Persons in possession of moose tags hunted a minimum of 1 day and a maximum of 135, with an average of 3 days per hunter.

Dall's sheep

Of the 71 people who purchased a tag, 47 responded to the survey. Of those, 27 reported a hunt taking place, and 11 kills resulted. All but one sheep had a full curl. Of the 10 hunters who recorded their mode of transport, one indicated backpacking, one backpacked and used a helicopter, three people reported backpacking in combination with aircraft, one person used aircraft only, and four hunters used helicopters only. The estimated harvest for Dall's sheep is 16.6 animals.

Black bear

Reported kill for this species was 12, with an estimated total

harvest of 20.9 animals (Tables 2 and 3). Hunters reported a hunt effort of between 0 and 30 days with an average of 2 hunt days.

Furbearers

Nineteen (19) wolves were killed in three regions, Fort Smith, Inuvik and Yellowknife.

Four wolverine were reported harvested, one by an Inuvik resident and the remaining three by Yellowknife residents.

Waterfowl

There were 1252 waterfowl reported retrieved by big game hunters, 85% of which were ducks. The mallard was the most frequently reported duck taken by the Fort Smith and Yellowknife Region hunters, and "other" ducks were dominant in the remaining regions (Table 4). Canada Geese were reported harvested most frequently by hunters in the Fort Smith, Yellowknife and Kitikmeot regions, Snow Geese were taken most frequently in the Keewatin Region, and in Inuvik the category with most reported kills was for unspecified geese (Table 4).

Big game hunters spent an average of 3 days hunting waterfowl, with a minimum hunt time of 0 days and a maximum hunt time of 20 days.

According to information provided by the Canadian Wildlife Service (CWS), the total 1988/89 waterfowl harvest for the NWT was estimated to be 5132 birds (Canada, Canadian Wildlife Service 1989). In this 1988/89 survey of resident big game hunters, 133

Table 4. Reported waterfowl harvest by resident big game hunters, NWT, 1988/89.

COMMUNITY	MALLARD	PINTAIL	OTHER DUCKS	SNOW GEESE	CANADA GEESE	OTHER GEESE
Ft. Liard	0	0	0	0	0	0
Ft. Providence	0	0	0	0	0	0
Ft. Resolution	0	0	0	0	0	0
Ft. Simpson	0	0	12	0	0	2
Ft. Smith	127	20	42	0	2	0
Hay River	62	33	98	3	19	4
Rae Edzo	43	6	9	11	3	7
Snowdrift	0	0	0	0	0	0
FORT SMITH REGION	232	59	161	14	24	13
Aklavik	0	0	0	0	0	0
Ft. Franklin	0	0	0	0	0	0
Ft. Good Hope	0	0	0	0	0	0
Ft. McPherson	0	0	0	0	0	0
Ft. Norman	0	0	0	0	0	0
Inuvik	8	4	49	5	13	10
Norman Wells	2	2	8	0	2	0
Sachs Harbour	0	0	0	0	0	0
Tuktoyaktuk	0	3	0	1	0	9
INUVIK REGION	10	9	57	6	15	19
Cambridge Bay	0	0	15	0	4	0
Coppermine	0	0	0	0	0	0
Gjoa Haven	0	0	0	0	0	0
Holman Island	0	0	0	0	0	0
Spence Bay	0	0	0	0	0	0
KITIKMEOT REGION	0	0	15	0	4	0
Baker Lake	0	0	0	0	0	0
Arviat (Eskimo Pt.)	0	0	0	1	0	0
Rankin Inlet	1	0	3	30	15	0
Repulse Bay	0	0	0	0	0	0
KEEWATIN REGION	1	0	3	31	15	0
Cape Dorset	0	0	0	0	0	0
Clyde River	0	0	0	0	0	0
Hall Beach	0	0	0	0	0	0
Igloolik	0	0	0	0	0	0
Iqaluit	0	4	0	0	0	0
Lake Harbour	0	0	20	0	0	0
Nanisivik	0	0	0	0	0	0
Pangnirtung	0	0	6	0	0	0
Pond Inlet	0	0	0	0	0	0
Resolute Bay	0	0	0	0	0	0
BAFFIN REGION	0	4	26	0	0	0
YELLOWKNIFE REGION	317	46	123	9	33	6
GRAND TOTAL	560	118	385	60	91	38

people claimed to have hunted waterfowl, though it is not known how many actually purchased a waterfowl licence. The reported kill for these 133 respondents was 1252 birds, composed of 84.9% ducks and 15.1% geese (Table 4). Assuming all 133 hunters had a licence, these individuals would account for 25.8% of all waterfowl hunters in the NWT. The reported harvest by these individuals accounts for 24.4% of the CWS estimated total NWT harvest.

Gamebirds

Resident big game hunters who responded to the survey reported a harvest of 5123 grouse and 5235 ptarmigan (Table 5), for a reported mean kill of 8.5 birds per hunter. The reported gamebird harvests for the Fort Smith and Yellowknife regions indicate a harvest of spruce grouse:ruffed grouse at a ratio of 2.4:1 for the Fort Smith Region, and 7:1 for Yellowknife Region. Though the ratio indicated for the Fort Smith region seems in keeping with the bird populations in that region, the Yellowknife ratio is unexpectedly low. The ruffed grouse range does not extend as far east as the spruce grouse, but tends to be limited to that area of the NWT east of the Mackenzie valley area. The spruce grouse range extends further west and includes the Great Slave Lake area (Godfrey 1979). Ruffed grouse harvest by Yellowknife Region hunters is, therefore, expected to be much rarer than reported, with a ratio closer to 25:1 considered normal (R. Bromley pers. comm). The reported ratio of 7:1 is likely due to mis-identification of species by hunters.

Table 5. Reported upland gamebird harvest by resident big game hunters, NWT, 1988/89.

COMMUNITY	SPRUCE GROUSE	RUFFED GROUSE	SHARP-TAILED GROUSE	PTARMIGAN
Ft. Liard	44	47	2	2
Ft. Providence	75	7	0	0
Ft. Resolution	12	0	3	20
Ft. Simpson	193	180	45	78
Ft. Smith	286	219	68	210
Hay River	941	190	212	781
Rae Edzo	59	31	16	95
Snowdrift	0	0	0	5
FORT SMITH REGION	1610	674	346	1191
Aklavik	0	0	0	0
Ft. Franklin	1	0	0	4
Ft. Good Hope	2	0	0	2
Ft. McPherson	0	0	0	26
Ft. Norman	9	0	0	10
Inuvik	50	2	22	465
Norman Wells	78	1	247	369
Sachs Harbour	0	0	0	0
Tuktoyaktuk	0	0	0	100
INUVIK REGION	140	3	269	976
Cambridge Bay	0	0	0	126
Coppermine	0	0	0	15
Gjoa Haven	0	0	0	0
Holman Island	0	0	0	0
Spence Bay	0	0	0	0
KITIKMEOT REGION	0	0	0	141
Baker Lake	0	0	0	5
Arviat (Eskimo Pt.)	0	0	0	15
Rankin Inlet	0	0	0	0
Repulse Bay	0	0	0	4
KEEWATIN REGION	0	0	0	24
Cape Dorset	0	0	0	2
Clyde River	0	0	0	0
Hall Beach	0	0	0	0
Igloolik	0	0	0	0
Iqaluit	0	0	0	113
Lake Harbour	0	0	0	42
Nanisivik	0	0	0	12
Pangnirtung	0	0	0	11
Pond Inlet	0	0	0	9
Resolute Bay	0	0	0	0
BAFFIN REGION	0	0	0	189
YELLOWKNIFE REGION	1611	228	242	2713
GRAND TOTAL	3361	905	857	5234

According to questionnaire responses, the average number of hunt days was 0, with a maximum hunt effort of 240 days. The average hunt effort of 0 is likely a reflection of big game huntersbeing primarily concerned with pursuing big game species and taking gamebirds on an opportunistic basis, as opposed to actively looking for gamebirds. A second factor is the failure of many hunters to provide the hunt days data for gamebirds.

RECOMMENDATIONS

There was a high response to the first wave of mailing using the current forms, and it is, therefore, recommended that, with one possible exception, no major changes be made to the 1989/90 questionnaires. The one exception, discussed below, is the possible inclusion of a question to determine which hunters purchased small game licences.

Two minor changes to the questionnaire that should be considered are the wording regarding hunt effort, and the deletion of the section regarding transportation used by Dall's sheep hunters. Rewording or highlighting might better ensure that hunters provide the number of days they actively hunted the species in question. The significant effect on response values based on wording for this type of question has been demonstrated (Filion 1981). The transportation information is of limited value when dealing with such a small number of hunters, and the space could be put to better use.

It is also recommended that the time frame between successive mailings be reduced to 4 week intervals. A shorter interval may reduce non-response bias by causing more hunters to respond, and may reduce some response bias. In a study by Sen (1973), reported harvest values for waterfowl were inflated as a greater period of time lapsed between the end of the harvest season and when a questionnaire was distributed; periods of 1, 2, 3, 4 and 8 weeks were used.

The inclusion of WMZ maps in the envelopes should be continued. By encouraging hunters to complete the WMZ portion of the questionnaire, the data input personnel need not look up location information and this can drastically reduce the time required to enter each wave of returns.

In order to estimate wolf, wolverine and small game harvest by big game hunters, more information is required regarding which hunters purchased those additional licences or tags. Without knowing total purchase, and number of purchased tags accounted for by that portion of the hunter population responding to the survey, estimates are not possible. The logistics of getting that information from the small systems main-frame should be investigated. A second option is to include a question asking hunters if they purchased a licence for those species and to modify the database to incorporate that response.

It is likely that harvest success for upland gamebird and waterfowl species is different between big game hunters and those hunters purchasing a small game or waterfowl licence only. The number of persons purchasing a small game licence only is a relatively small group of approximately 500 individuals, and it is, therefore, recommended that a second "small game" survey be initiated to assess harvest, especially concerning upland gamebirds, by that potentially specialized group of hunters. This second survey would also provide an opportunity to ask hunters whether or not they also purchased a waterfowl licence and to request some harvest information. The data from such a survey

could be used to assess the validity of using big game hunter harvest of small game to estimate the small game harvest by all NWT residents. Also, the waterfowl information would allow an opportunity for harvest data to be compared to the CWS survey results which are based on a subsample of waterfowl hunters.

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APPENDIX A. 1988/89 hunter harvest questionnaire and cover letters.

HUNTER HARVEST QUESTIONNAIRE, 1988/89

DO NOT REMOVE LABEL. QUESTIONNAIRE IS CONFIDENTIAL WHEN COMPLETED.

NOTE:

1. THIS QUESTIONNAIRE PERTAINS TO THE PERIOD OF JULY 1,1988 TO JUNE 30, 1989
2. PLEASE complete each section whether your hunting trip was successful or not.
3. This information is confidential and will not be used for enforcement purposes.
4. A "Wildlife Zone" map is enclosed.

A 

Did you hunt BARREN-GROUND CARIBOU? Yes ☐ No ☐

If yes, were you successful? Yes ☐ No ☐

Provide the following data - whether your hunt was successful or not.

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	Number of each type of kill: Bulls	Cows	Juveniles

B 

Did you hunt MOOSE? Yes ☐ No ☐

If yes, were you successful? Yes ☐ No ☐

Provide the following data - whether your hunt was successful or not.

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	Number of each type of kill: Bull	Cow	Juvenile

C 

Did you hunt WOODLAND CARIBOU? Yes ☐ No ☐

If yes, were you successful? Yes ☐ No ☐

Provide the following data - whether your hunt was successful or not.

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	Number of each type of kill: Bull	Cow	Juvenile

D 

Did you hunt MOUNTAIN GOAT? Yes ☐ No ☐

If yes, were you successful? Yes ☐ No ☐

Provide the following - whether you were successful or not.

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	If you killed a goat Type of kill: Billy	Nanny

E 

Did you hunt BLACK BEAR? Yes ☐ No ☐

If yes, were you successful? Yes ☐ No ☐

Provide the following - whether you were successful or not.

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	If you killed a bear Type of kill Boar	Sow

F 

Did you hunt DALLS SHEEP? Yes ☐ No ☐

If yes, were you successful? Yes ☐ No ☐

Provide the following information - whether you were successful or not.

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	If you killed a sheep Type of kill 3/4 curl	full curl

Method of Transportation (check one) : Road ☐ Aircraft ☐ Back pack ☐ Helicopter ☐

G 

Did you hunt UPLAND GAMEBIRDS? Yes ☐ No ☐

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	How many of each kind did you bag? Spruce Grouse	Ruffed Grouse	Sharp-Tailed Grouse	Ptarmigan

H **Did you hunt WOLVES?**

Yes ☐ No ☐

Did you kill any wolves? Yes ☐ No ☐

If yes, How many? ____

General Location: _____

I **Did you hunt WOLVERINE ?**

Yes ☐ No ☐

Did you kill any Wolverine? Yes ☐ No ☐

If yes, how many? ____

General location: _____

J 

Did you hunt WATERFOWL? Yes ☐ No ☐

Indicate number bagged

Hunt location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	DUCKS Mallard	Pintail	Other	GEESE Snow Goose	Canada	Other

Northwest Territories Renewable Resources

July, 1989

Dear Hunter:

Resident Hunter Harvest Survey, 1988/89

Thank you to all those who participated in last year's survey. The information you provide through these questionnaires is necessary for wildlife management. A summary of the resident harvest estimated from last's years survey is enclosed.

This questionnaire is sent to all those who purchased a resident big game licence in 1988/89. Please complete and return it in the self-addressed envelope as soon as possible (no postage required). Quick return of forms is encouraged in order to reduce costs from mailing subsequent reminder letters.

Following is an example of how to complete the form. A map showing the Wildlife Zones is enclosed for your use.

Did you hunt **MOOSE?** Yes ☐ No ☐
If yes, were you successful? Yes ☐ No ☐

Please provide the following information - whether you made a kill or not

location	Wildlife Zone	Month of Hunt	# Days Hunted	Bulls	Cows	Juv.
Near Rae	F-1	Sept	3	-	-	-
65°00 128°09	E/1-3	Nov.	7		1	

Some major points to consider regarding this survey are:

1. Individual information is considered **confidential** and information will not be used for enforcement purposes;

2. It is just as important to **complete and return the forms if you did not hunt, or if you hunted and were unsuccessful.** For unsuccessful hunts, information on number of days hunted and location of hunt is valuable;

3. The more people who respond to this survey, the more accurate the estimate of total harvest will be, and

4. Provide information for last year's hunting season only (i.e., July 1, 1988 to June 30, 1989).

Thank you in advance for completing the questionnaire. Should you have any comments or questions, please feel free to enclose them with the survey or contact this office.

Sincerely yours,

Kevin Lloyd
Director
Wildlife Management Division

Enclosure

Northwest Territories Renewable Resources

September, 1989

Dear Hunter:

Resident Hunter Harvest Survey, 1988/89

Approximately six weeks ago this Department sent you a letter and questionnaire regarding your hunting activities for the 1988/89 hunting season. In the event that you did not receive the letter or have since mislaid it, a new questionnaire is enclosed. Please complete and return it in the provided self-addressed envelope (no postage required), **even if you did not hunt or hunted but did not make a kill.** Quick return of forms helps to reduce the cost of mailing subsequent reminder letters.

This is an opportunity for you to participate in wildlife management. Some major points to consider regarding this survey are:

1. All information is **confidential** and will not be used for enforcement purposes;

2. Information should be provided for last year's hunting season only (i.e., July 1, 1988 to June 30, 1989), and

3. A map showing the Wildlife Zones is enclosed for your use while filling in the questionnaire.

The following is an example of how to complete the form.

Did you hunt MOOSE? Yes ☐ No ☐
If yes, were you successful? Yes ☐ No ☐

Please provide the following whether you were successful or not

location	Wildlife Zone	Month of Hunt	# Hunt Days	# of animals killed Bulls	Cows	Juven.
Near Rae	F-1	Sept.	3	—	—	—
20 Km E. Hay R.	E/1-3	Nov.	7	0	1	0

Thank you in advance for completing the questionnaire. Should you have any comments or questions, please feel free to enclose them with the survey.

Sincerely yours,

Kevin Lloyd
Director
Wildlife Management Division

Enclosures

Northwest Territories Renewable Resources

October, 1989

Dear Hunter:

Resident Hunter Harvest Survey, 1988/89

Over the past few months the Department of Renewable Resources has sent you information, and a questionnaire form, regarding your hunting activities of the July 1, 1988 to June 30, 1989 hunting season. The questionnaire was sent to all persons who purchased a resident big game licence. Everyone who receives a questionnaire **should complete and return the form** in the provided self-addressed envelope (no postage required), **even if they did not hunt, or hunted but did not make a kill.**

The information provided through this survey is necessary for wildlife management. It is also an opportunity for you to participate in management. A summary of the estimated harvest based on last year's survey is enclosed.

I urge you to cooperate with this request for information. If you have already mailed in a questionnaire then I thank you in advance for your time and effort.

Following is an example of how to **complete each section** of the questionnaire:

Did you hunt **MOOSE?** Yes ☒ No ☐
If yes, were you successful? Yes ☒ No ☐

Please provide the following whether you made akill or not

location	Wildlife Zone	Month of Hunt	# Days Hunted	# of animals killed Bulls	Cows	Juv.
Near Rae	F-1	Sept.	3	-	-	-
20 Km E. Hay R	G-1	Nov.	7	0	1	0

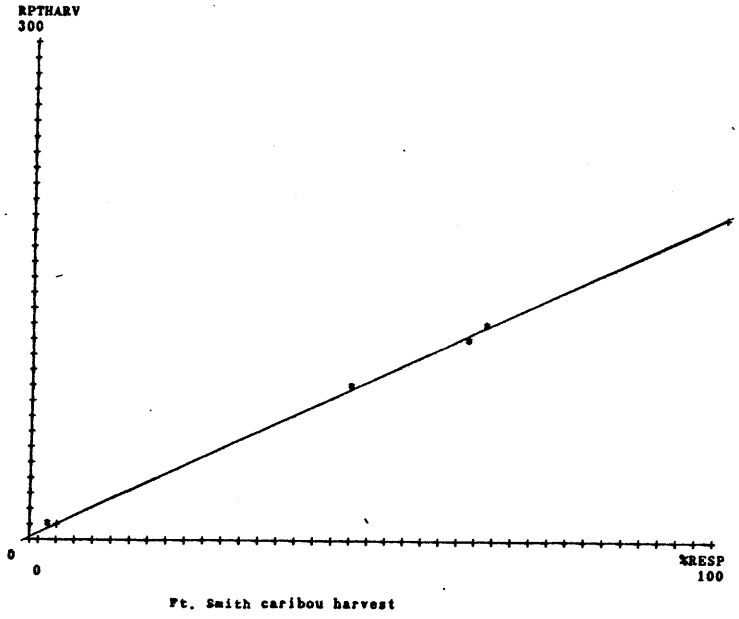
If you have any questions or comments about this survey please feel free to enclose them with your questionnaire.

Sincerely yours,

Kevin Lloyd
Director
Wildlife Management Division

Enclosure

APPENDIX B. Regression analysis for estimation of barren ground caribou harvest, by region.



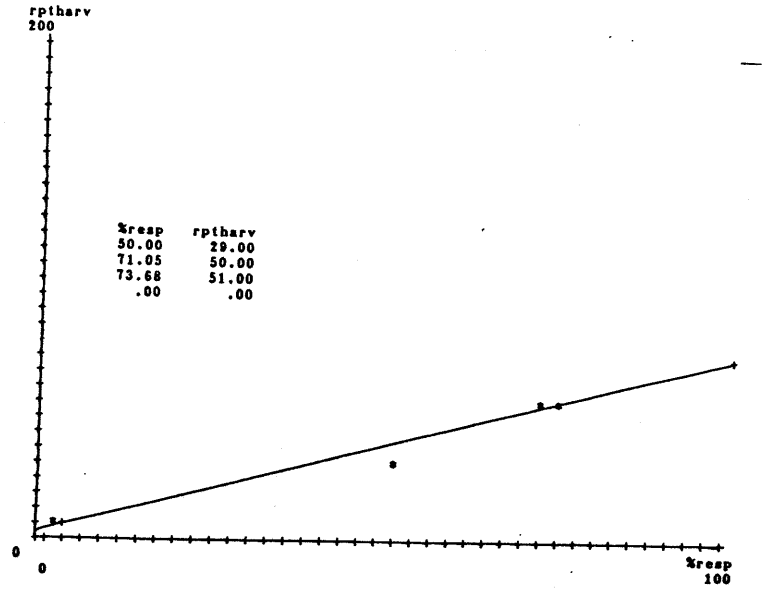
Ft. Smith caribou harvest

HEADER DATA FOR: A:CARIBOU LABEL:
NUMBER OF CASES: 4 NUMBER OF VARIABLES: 2

REGRESSION EQUATION (Shown by +'s on scatterplot):

INTERCEPT= .0520790544 SLOPE= 1.9684136454798

r = .9988 r squared = .9976



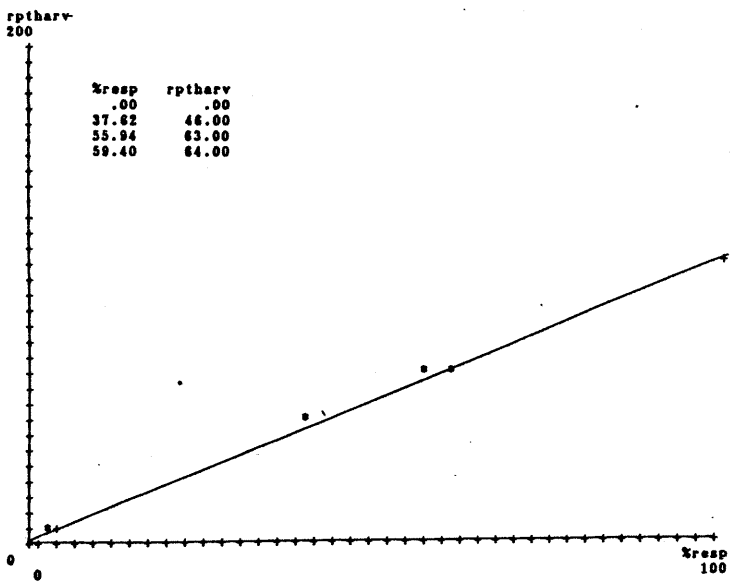
Kitikmeot Region Caribou Harvest

HEADER DATA FOR: A:CARIBOU LABEL:
NUMBER OF CASES: 26 NUMBER OF VARIABLES: 2

REGRESSION EQUATION (Shown by +'s on scatterplot):

INTERCEPT= -1.34976731938 SLOPE= .69531694796852

r = .9923 r squared = .9846



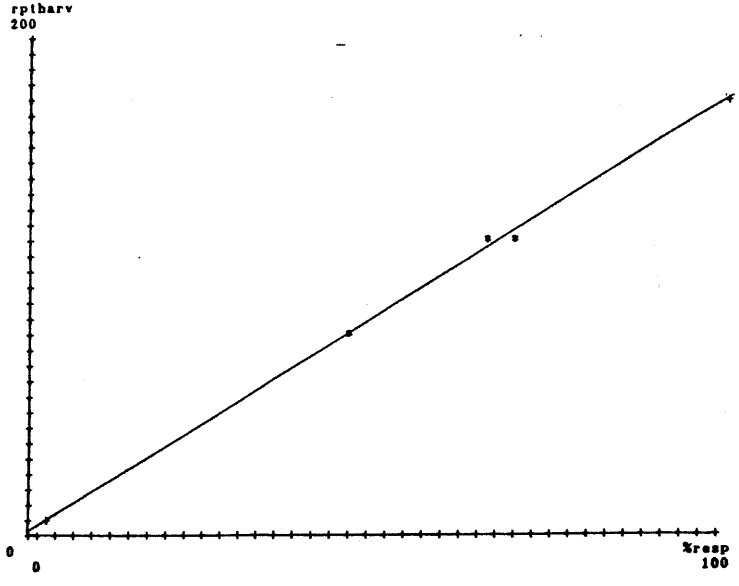
Keewatin Region Resident Hunter Caribou Harvest, 1988/89

HEADER DATA FOR: A:CARIBOU LABEL:
NUMBER OF CASES: 26 NUMBER OF VARIABLES: 2

REGRESSION EQUATION (Shown by +'s on scatterplot):

INTERCEPT= 1.276614170791 SLOPE= 1.097630382563

r = .9964 r squared = .9927



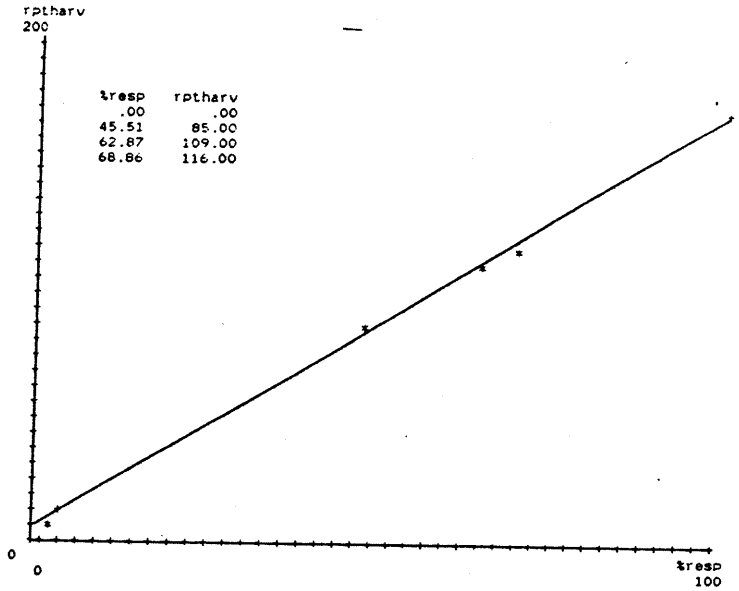
Inuvik caribou harvest

HEADER DATA FOR: A:CARIBOU LABEL: caribou region2
NUMBER OF CASES: 3 NUMBER OF VARIABLES: 2

REGRESSION EQUATION (Shown by +'s on scatterplot):

INTERCEPT= -1.07649609714 SLOPE= 1.7492828073921

r = .9900 r squared = .9800



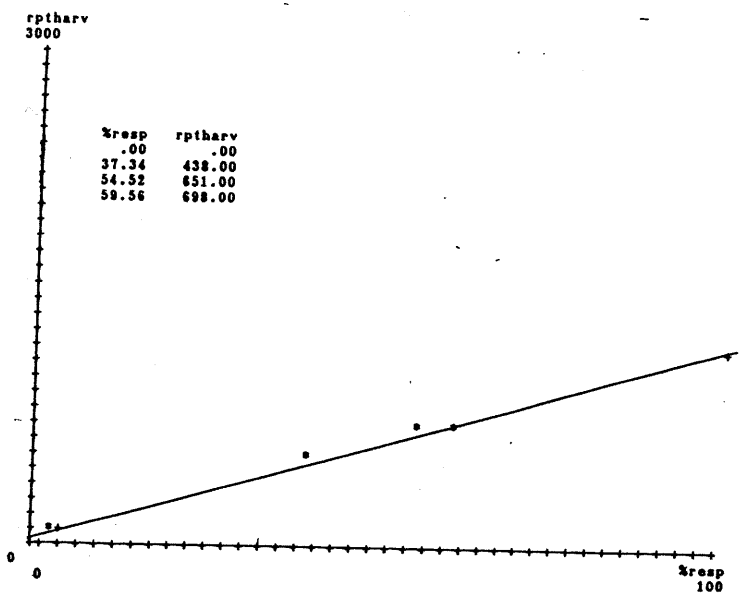
Baffin Region Resident Hunter Caribou Harvest, 1988/89

HEADER DATA FOR: A:CARIBOU LABEL:
NUMBER OF CASES: 4 NUMBER OF VARIABLES: 2

REGRESSION EQUATION (Shown by +'s on scatterplot):

INTERCEPT= 1.831342508404 SLOPE= 1.7077106181809

r = .9974 r squared = .9947



Yellowknife Region Resident Hunter Caribou Harvest, 1988/89

HEADER DATA FOR: A:CARIBOU LABEL:
NUMBER OF CASES: 26 NUMBER OF VARIABLES: 2

REGRESSION EQUATION (Shown by +'s on scatterplot):

INTERCEPT= -.36763620106 SLOPE= 11.811323106619

r = .9999 r squared = .9997