SHARING A MOOSE IN NORTH CENTRAL ONTARIO

H. R. Timmermann and R. Gollat

Ontario Ministry of Natural Resources, Thunder Bay, Ontario

Abstract : Hunting was believed to have contributed to the decline of Ontario moose populations during the period 1968-75. Delayed season opening dates, increased licence fees and resident only seasons were only partially successful in moderating harvests. New regulations introduced in 1980 and continuing through 1982 were intended as interim measures to further reduce the harvest and allow population recovery. Termination of legal party killing, further reductions in season length and a party sharing requirement were the passive measures used. Hunter numbers and harvests declined significantly during the first two years but increased to near former levels by the third year of implementation. While initially sceptical, hunters became increasingly willing to share a moose, thus allowing hunting opportunities to be maintained at significantly higher levels than would otherwise have been possible. Reduction in economic benefits to the tourist industry and party harvest related enforcement charges are discussed. An area specific selective harvest system introduced Province-wide in 1983 replaced the legal requirements of sharing a moose.

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162

Hunting was identified as a contributing factor to moose population declines in Ontario during the early 1970's. Traditional methods of harvest control including shorter seasons, resident only seasons and licence fee increases were applied in an effort to reduce hunter kill (Timmermann and Gollat, 1982). In 1978 a provincial review of the problem of declining populations (Euler 1983) indicated further area specific harvest control measures were necessary. A series of 72 public meetings held across Ontario in 1979 (O.M.N.R. 1980) sought support for a wide range of options aimed at increasing moose numbers. Shorter seasons and sharing a moose with one or more hunters were supported by the majority of the 7,400 hunters who attended these meetings.

Sharing a moose is common among hunting parties even though individual members are entitled to shoot and claim one animal in most jurisdictions. Some Provinces or States however, either legally require hunters to hunt in groups or encourage party applications in an effort to maximize recreational opportunities. Minnesota for example initiated a biennial quota hunt in 1971 which requires four hunters to jointly apply for a licence to kill one moose, (Judd 1972, Karns 1972). In Newfoundland, preference has been given to joint applicants over individuals since 1976 (Hancock and Pike 1980), while in Maine applicants for a limited number of licences can designate a subpermittee (Durn and Morris 1981). Since 1963, those wishing to hunt in Quebec's game reserves have been required to apply in groups

of two or three for the privilege of shooting one moose (Bouchard and Moisan 1974). The sharing requirement was extended to areas outside game reserves beginning in 1979 (Crête 1982). Initially an unlimited number of permits were issued, requiring permanent groups of two or three hunters to collectively hunt for one moose. Since 1980, this regulation has become more flexible and now only requires that two hunters in a field party tag the moose shot (Crête pers. comm. 1984).

Ontario initiated significant changes in moose hunting regulations in 1980 with the objective of reducing the harvest by 10 - 153. These included reduced season length, termination of legal party killing and a requirement for hunters to share a moose during the first half of the season. The new regulations were intended as interim measures prior to the introduction of a Province-wide quota hunt and were in effect for three years 1980-82 inclusive.

METHODS

Regulation changes in 1980 were introduced as the party harvest system. Prior to I November, all moose hunters were legally required to hunt in parties of two or three persons. Parties could form and reform at any time. Each party had the option of hunting in any Wildlife Management Unit (WMU) but could kill or possess only one moose of either sex. After killing a moose, any two members of the



164

party were required to attach their game seals to the carcass, thus invalidating their licence. In parties of three hunters, the third member had to find at least one other partner with an unused seal before resuming hunting. In 1981, regulations were amended specifically requiring the person killing a moose and one other member of the party to utilize their game seals. For a two week period beginning 1 November and throughout the special bow and muzzle loader seasons, hunters were permitted to hunt alone and take one moose per licence.

The effect of regulation changes was examined for a six year period 1977-1982; three years before and three years after introduction of the party harvest system (Table 1).

Table 1. A summary of Ontario moose regulation changes 1977-82

Time Period	1977 - 79	1980 - 82
Season-length	Res 2 mo.'s (11 Oct 15 Dec.)	Res 1 mo. (15 Oct 15 Nov.)
	N.Res 1 mo. (18 Oct 15 Nov.)	N. Res 2 wks. (18 - 31 Oct.)
Sealing requirement	l seal / moose	2 seals / moose to 31 Oct. 1 seal / moose 1-15 Nov.
Party size	no restriction	2 or 3 to 31 Oct. no restriction 1-15 Nov.
Party killing *	legal	illegal

^{*}Party killing prior to 1980 allowed one hunter to shoot as many moose as there were hunters with valid licences in his/her hunting party.

Changes in regulations were communicated to hunters and management staff by means of a 20 question/answer pamphlet entitled "Moose Hunting 1980, What you should know" (Appendix 1). In addition, major changes were highlighted in the annual summary of hunting regulations, feature articles in newspapers, trade magazines and interviews with management and enforcement staff on radio and T.V. Enforcement related aspects were reviewed collectively with all field staff to foster a uniform approach to legal questions.

The viability of the party harvest system as a harvest strategy was assessed by examining:

- 1) changes in hunter numbers, harvest magnitude and composition
- 2) the impact of the regulations on the commercial tourist industry
- 3) enforcement related charges
- 4) the predictability of area specific harvests

Harvest data for 14 WMU's managed by the North Central Region (Fig. 1) was obtained from an annual Provincial mail survey of hunters and a voluntary jaw collection program (Gollat and Timmermann 1983). For age analysis, five arbitrary age classes were used: calves (.5 yr. - either sex), teen bulls (1.5 - 4.5 yr.), prime bulls (5.5 - 10.5 yr.), yearling cows (1.5 yr.) and breeding cows (\geq 2.5 yr.). Enforcement statistics were taken from Offence, Seizure and Prosecution records

Wildlife Management Units in Ontario. (WMU)

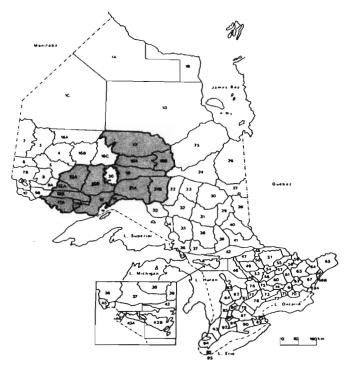


Fig. 1. Location of 14 WMU's used in party harvest system assessment N.C. Region, Ontario



for five N.C. Region districts and summarized into two categories.

Data estimating economic losses experienced by the commercial tourist industry in Northwestern Ontario in 1980 was based on a telephone survey conducted by the Provincial Ministry of Tourism and Recreation.

RESULTS AND DISCUSSION

Harvest and Hunter Numbers

The 1980 moose harvest was significantly reduced over 1979 levels both Province-wide and in the N.C. Region by 28 and 40 percent respectively (Table 2). Similarly, total hunter numbers dropped 15 and 17 % . N.C. Region hunters shot 3200 fewer moose during the 1980-82 hunting seasons than in the previous three years. The objective of reducing harvests by 10-15% was exceeded in each of the three years.

Table 2. Changes in moose hunter numbers and harvests 1977-82.

Hunt	er Number	rs X 1000		Est. Ha	rvest X 1000		
Year	Prov.	N.C.Regi	on	Prov.	N.C.Region		
1977	72.5	18.8		9.0	3.0		
1978	79.9	20.6	% change over 1979	11.1	3.6	% cha	
1979	78.0	20.4	Prov. NCR	11.7	3.7	over Prov.	
1980	66.7	17.0	-15 -17	8.4	2.2	-28	-40
1981	70.0	16.2	-10 -21	8.1	2.0	-31	-45
1982	76.0	17.9	- 3 -12	9.3	2.9	-20	-22

Algonquin Region hunter no.'s and harvests 1978,80,82 not included



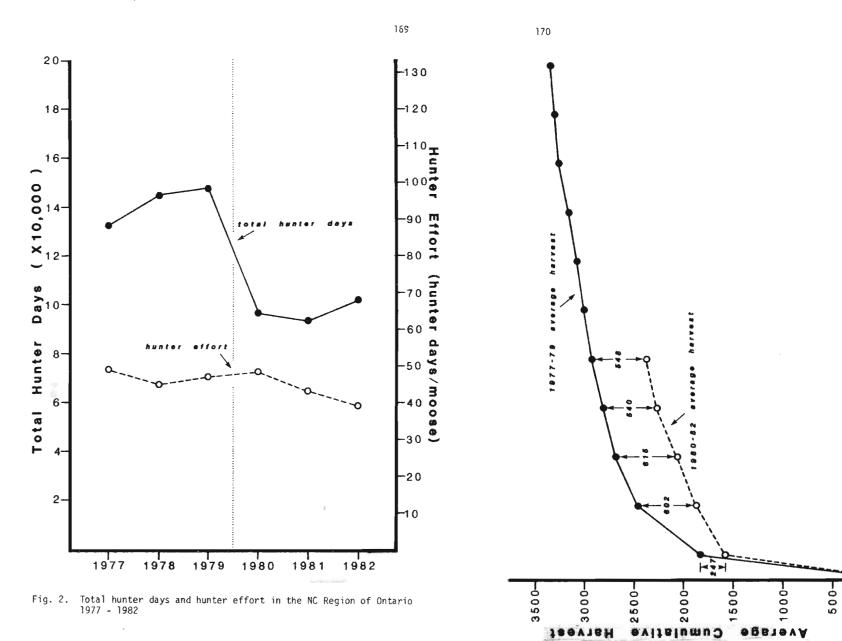
Hunter effort (hunter days per moose harvested Fig. 2) was relatively stable during the period 1977-80 ($\bar{x}_4 \pm \text{SE} = 47.2 \pm 0.9$) but declined in 1981 and 1982. This suggests that more moose may have been available to hunters following reduced harvests in 1980. This hypothesis is supported by the findings of Crête et al. (1981) in Quebec, where a direct relationship between moose density and hunter effort was observed. Alternatively moose may have been more vulnerable to hunting pressure during the latter two years.

Total hunter day trends (Fig. 2) are primarily a reflection of hunter numbers during the six year period.

Temporal Distribution of Harvest

The largest harvest reduction (Fig. 3) occurred during the first three weeks when the majority of hunters are normally in the field.

Compared to the period 1977-79, an average of 247 or 14% fewer moose were shot 1980-82 after the first week of the season. This difference increased to 615 (23% lower) by the end of week three. The differences between the two periods began to stabilize after I November and actually declined to 548 or 19% by 15 November. This suggests that more moose may have been available to the hunter 1980-82



Average cumulative moose harvest by week for a 3 year period prior to and after initiation of a party harvest system in the NC Region of Ontario Fig. 3.

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in the November period compared to 1977-79 because of reduced harvest levels during the first half of the season. Alternatively, proportionally more hunters may have hunted during this latter period in an effort to individually claim a moose.

Harvest Composition

The composition of the 1977-79 harvest remained relatively stable (x^{1} =.48, d.f.= 4, P>.05). Bulls, cows and calves averaged 47.7, 38.1 and 14.2 percent of the harvest respectively (Table 3). During the 1980-82 system, the proportion of bulls harvested increased marginally, cows remained stable while calves decreased significantly to 11.5% (P <.05). In addition a decrease in the proportion of prime bulls (P <.05) and a corresponding increase in the juvenile bull component (P <.01) occurred. Little change was observed in the proportion of juvenile and breeding cows between the two periods (P>.05).

Hunter Selectivity

The proportion of calves in the harvest decreased significantly (P<.05) during the period when two seals per moose were required (Fig.4) but not uniformly throughout the hunting season ($x^7 = 31.90$, d.f.= 8, P<.05). Conversely, a higher percentage of calves were shot on average during the latter half of the 1980-82 seasons when



Table 3. Sex and age composition of hunter harvested moose for three years before and after initiation of a party harvest system in North Central Region

		Percent Total				Percent Bulls			Percent Cows		
Year	<u>N</u>	Bulls	Cows	Calves	ļ	<u>N</u>	Teen	<u>Prime</u>	N	Yearlings	Breeders
1977	2067	47.1	39.2	13.7		856	78.6	18.5	701	44.9	55.1
1978	2122	50.2	35.7	14.1		899	76.8	19.4	648	31.9	68.1
1979	2409	45.8	39.4	14.7	ľ	949	80.8	16.9	800	28.6	71.4
₹3		47.7	38.1	14.2			78.7 ³	18.3 ²		35.1	64.9
									·		
1980	1295	49.8	38.0	12.2	1	549	82.3	13.5	429	38.9	61.1
1981	1680	52.0	37.7	10.2		769	82.7	14.3	551	34.5	65.5
1982	2284	48.4	39.6	12.0		941	84.4	13.7	764	36.0	64.0
\overline{X}_3		50.1	38.4	11.5			83.1 ³	13.82		36.5	63.5
$1977-79 > 1980-82$ at 1 (P<0.05)					;	² (P<0	.01)				
$1980-82 > 1977-79$ at 3 (P<0.05)											



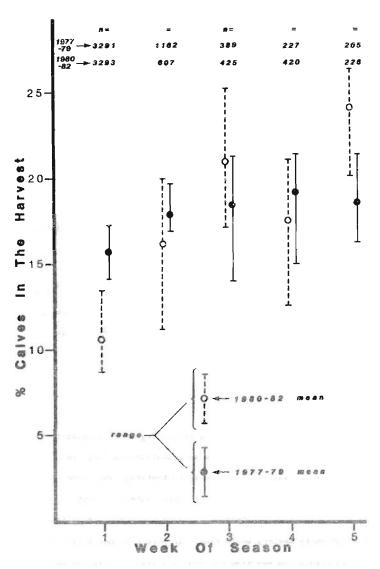


Fig. 4. Average percent and range of calves in the harvest during the first week of the moose season for a 3 year period prior to and after initiation of a party harvest system in the NC Region of Ontario



individual hunters could claim a moose.

Prior to 1980, 56 calves/100 observed were harvested in October compared to only 36 during the same month 1980-82 (Fig.5). A substantial increase however to 52 calves harvested/100 observed was noted during the 1980-82 November period.

Although fewer adults /100 observed were also harvested during the 1980's, the ratio remained constant at approximately 59-60/100 during both the October and November periods.

This pattern suggests that hunters may have deliberately passed up a calf and selected a larger animal when given a choice, particularly during the two seal/moose period. To what extent weather may have influenced observed trends is not known.

Enforcement Implications

The party harvest system introduced a higher degree of complexity to existing game regulations as well as an education challenge in conveying new rules and their rationale to hunters. The loose definition of a party requiring two or three hunters to hunt co-operatively in close proximity was a common concern. Many feared dispersal of party members would result in more than one moose being shot. This regulation was also the most difficult to explain and

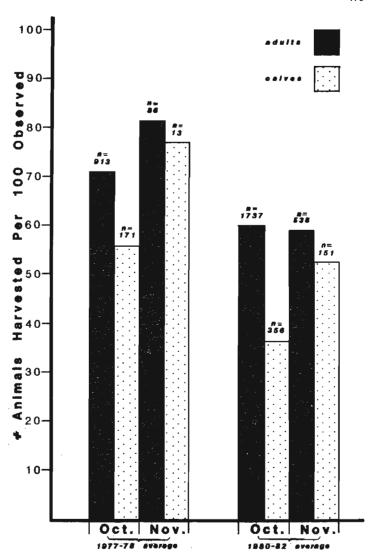


Fig. 5. Average percent adults and calves harvested during Oct. and Nov. prior to and after initiation of a party harvest system in 2 WMU's in the NC Region of Ontario



police uniformly by field enforcement staff. In addition, a common complaint was the termination of hunting opportunities by those who shot and tagged a moose. After a long tradition of legal party killing, this provision was difficult to accept and proved virtually unenforceable, particularly when two or more parties, often members of a larger group, conducted their hunting activities in close proximity. On the positive side, from a management point of view, two hunters were effectivley removed from the hunt each time a moose was shot and sealed.

Moose enforcement charges are summarized in two groups comprising five specific party harvest related violations and a general category including: having a loaded firearm in a motor vehicle or boat, hunting without a licence and possessing an unencased firearm after dark (Table 4). Total charges in 1980 were the lowest during the six year period probably due in part to a shorter season and a generally cautious approach taken by hunters and enforcement staff. General charges were significantly lower during the three year period 1980-82 than during the years prior to 1980. Party harvest related charges however increased from 1980-1982 probably due to a progressively more vigorous enforcement effort as well as a less cautious hunter attitude. A significant increase in failure to party hunt charges in particular, may have reflected this change in outlook.

Table 4. Annual moose related enforcement charges, N.C. Region 1977-82

		Number	Year	ear			
A. <u>P</u> a	arty Harvest Related Charges	1977	1978	1979	1980	1981	1982
1)	transfer of licence or seal	4	1	0	11	8	11
2)) failure to party hunt	N/A	N/A	N/A	4	25	49
3)) failure to seal immediately	N/A	N/A	N/A	6	0	10
4)) shooter fail to seal	N/A	N/A	N/A	N/A	0	2
5)	shoot more than one moose	N/A	N/A	N/A	0	0	2
B. Ge	eneral Charges	93	85	117	63	72	95
C. To	otal Season Charges	97	86	117	84	105	169

Economic Impact to Commercial Tourism

The hunting and fishing lodge industry is a major contributor to the economy of Northern Ontario and most small communities are dependent on hunters and fishermen for a portion of their livelihood (Ruston et al. 1979). A high proportion of non-resident hunters traditionally use tourist outfitting facilities.

In 1980, hunters were faced with substantial cost increases as well as restrictive changes in moose regulations. Non-residents, for example, faced the choice of hunting together in parties of two or three for a



licence fee of \$200.00 each or hunting individually with a guide possessing a valid licence who could act as a hunting partner.

Sharing a moose was unacceptable to a large number of non-residents and consequently only half as many purchased a licence and hunted in 1980-82 as had in each of the three previous years (Table 5). As a result, tourist outfitters in WMU 1C through 21B (Fig. 1) lost an estimated one million dollars in gross revenue in 1980, according to a survey conducted by the Ontario Ministry of Tourism and Recreation (Baughman 1980). The telephone survey of nearly 100 outfitters who derived a significant portion of their income from moose hunting, revealed that the average loss per outfitter was over \$10,000.00. Consequently, fewer moose hunting packages consisting of accomodations, fly-in services and boat and motor rentals were sold.

Table 5. Provincial and NC Region non-resident moose hunter numbers 1977-82

Year	Province	- x ₃	NC Region \overline{X}_3
1977	6,284		1,293
1978	6,967	6,824	1,589 1,484
1979	7,223		1,570
1980	3,927		914
1981	3,105	3,364	571 674
1982	3,061		537

Harvest Control

Control of hunter kill at or below a predetermined allowable harvest determines the success or failure of a harvest strategy. The passive control measures used during this study period were only partially successful in controlling the annual hunter kill (Table 6). In each of the three years prior to 1980, when populations were considered stable, actual harvests exceeded the calculated allowable harvest by > 10% in five or more WMC's. Harvests were reduced in all WMC's during the party harvest system. While excessive harvests occurred in eight WMC's in 1979, the problem was limited to only two WMC's in 1980 and 1981. Allowable harvests were however exceeded in four WMC's in 1982, indicating a shift towards uncontrolled harvests.

CONCLUSIONS

The party harvest system was in place for three years as an interim measure prior to the introduction of a Province-wide selective harvest strategy in 1983 (Gollat and Timmermann 1983). Most resident hunters grudgingly accepted sharing a moose as a necessary step in reducing harvests while maintaining universal hunting opportunities. Many non-residents, however, cancelled their plans to hunt moose in Ontario. The sharing a moose requirement, licence fee increases and



Table 6. Annual moose harvest for 3 years before and after initiation of a party harvest system compared with a 1982 nonselective harvest quota, North Central Region

		To	tal Annu	al Harve	st		
WMU	1977	1978	1979	1980	1981	1982	1982 Harvest Quota
11A	38*	64*	65*	34*	17	37*	30
118	46	79*	79*	41	24	39	70
12A	74	96	79	45	30	72	137
12B	266*	347*	283*	161	239*	301*	213
13	474	490	611*	407	412	684*	500
14	76	103	125*	118*	66	77	100
15B	356	580	645*	379	423	427	560
17	52	145	100	84	54	71	150
18A	92	66	66	62	45	67	88
18B	14*	10	10	9	8	8	12
19	226*	339*	297*	179	217*	190*	165
21A	494	469	470	244	294	289	459
21B	594*	562*	565*	294	343	361	426
Total	2802	3348	3395	2057	2172	2623	2910

^{*}harvests ≥ 110% of 1982 harvest quota

curtailed seasons were the main reasons given.

Harvests were reduced passively during the traditional October season when hunting pressure is greatest and the majority of moose are shot. Sharing a moose and the elimination of legal party killing were thought to be the main reasons for the reduction. Some hunters however deliberately passed up calves in favour of a larger adult during October when given the choice. The November, one seal per moose season, favoured local residents and allowed trappers, guides and those living in isolated locations to hunt during a period when moose are considered less vulnerable and more difficult to locate.

The additional regulations associated with the party harvest system often required conservation officers to make subjective judgements. Failure to party hunt charges increased substantially over the three year period as hunters and enforcement staff became more familiar with game regulations.

The party harvest system, while allowing continued hunting universality was not without costs. Many thousands of recreational user days and non-resident clients of the tourist industry were lost. The general economy of Northern Ontario probably suffered losses measuring in the millions of dollars.

Even though hunter numbers and harvests were decreased initially, the



182

resultant increase in moose began to attract additional hunters and produced increased kills without predictable area specific control. The selective harvest system which replaced the party harvest system in 1983 allows longer seasons by limiting the number of adult moose hunting opportunities in each WNU.

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1980 Know Moose Hunting What You Should





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Appendix I. Party Harvest System Communications Pamphlet

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O. Is a hunter required to aiways hunt with the same partner toloire Novembee 1?

A. Any two or three persons may hunt orgather provided they all have visid mose licences which are on their person-while huntings and the seals for their licences have not been used.

15

A party may that and not persons while hunting and the seals for their licences have not been used.

A party may that and postess only DNE moose or that had not been been to the persons will before November 1.7

A party may that and postess only DNE moose or that had not been been been been required in the same or which one hunter could shoot is a series of their licences in the party, is not configuration with one or more other mounts; with one or more other and possess more than one moose? In the notices is all one was standing next to the one should moose is standing next to the person. Must divide into two or more parties before starting the hunt on a specific day or partial day.

