THREATS TO THE SUSTAINABILITY OF MOOSE MANAGEMENT IN FINLAND

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ABSTRACT: The large population of moose (*Alces alces* L.) in Finland has resulted in increased browsing damage and traffic accidents. Hunting is the only means available for controlling the moose population. Currently, about 100,000 hunters spend approximately 1 million man-days/year to harvest around 70,000 moose/year. Hunting is a voluntary activity in Finland and hunting rights belong to landowners. However, the social basis of moose hunting is in danger of being eroded. The number of active farms has decreased considerably in recent years and the decrease will continue for the foreseeable future. Out-migration and the aging of the rural population will continue to weaken the vitality of rural areas at least until 2030. This paper examines the current structure of moose hunting clubs in the face of these perceived threats. A quarter of the club leaders estimated that the average age of their members is between 50 and 60 years. While the membership of most hunting clubs has remained static in recent years, signs of future membership problems are acknowledged as young people do not seem to be attracted to moose hunting, and older members are beginning to find hunting too strenuous. If moose hunting clubs are to remain viable, they must meet the challenges presented by changing rural demographic and socio-economic conditions. Pre-conditions for hunting club membership occur in 70 – 80% of clubs and strongly reflect the nature of the current membership structure. Pre-conditions for membership may have to be revised and more will have to be done to attract younger members. While changes in the current governance of moose hunting will be required, these are unlikely to occur in the near future due to local power structures that are vested in the ties between land ownership and moose hunting.

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The moose (*Alces alces* L.) is the largest animal in the boreal forest ecosystem, and its population in Finland has increased considerably during the past few years. The estimated pre-hunting season number in 2002 was about 180,000 animals, and the post-hunting population in winter 2002-2003 was 113,000 – 125,000 animals (Finnish Game and Fisheries Research Institute 2004) (Fig. 1).

The desired size of the moose population, the level of the state's compensation to forest owners for moose damage (e.g., Helle et al. 1987), and measures to reduce moose-related road accidents (Haikonen and Summala 2000) are topics of public concern in Finland. The pubic debate has been hampered by inadequate knowledge of the interested parties – the debate being frequently informed by generalities that may have little to do with reality.

To address this lack of knowledge, the Finnish Forest Research Institute has conducted a multi-disciplinary project, "Moose and Society" that has examined the costs and benefits of the moose from the standpoint of the main interested parties. First, the structure and activities of moose hunting clubs were assessed by a survey of over 5,000 moose hunting clubs in 1999 (Koskela and Nygrén 2002). At that time, about 800,000 man-days had been employed for hunting by about 100,000 hunters. A mean input of 16.5 hunting days was required to harvest one moose,

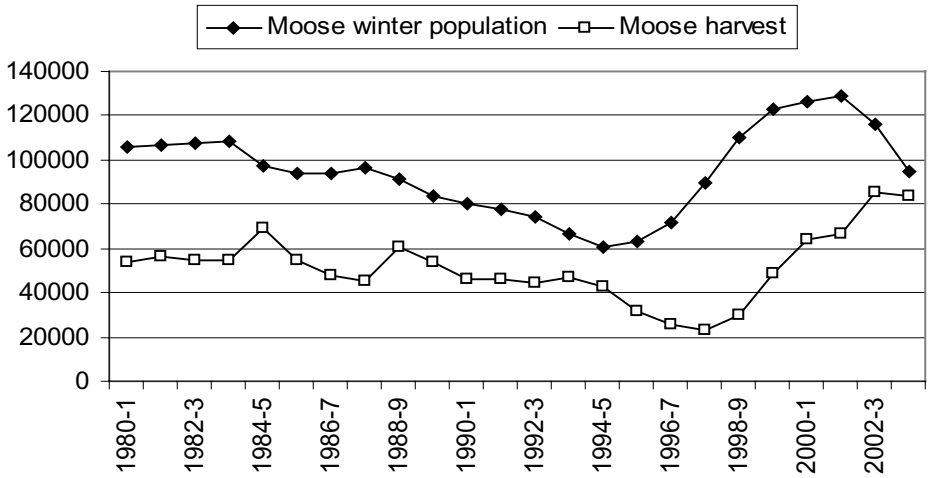

Fig. 1. Post-harvest winter population of moose and the moose harvest in the hunting years 1980-1 to 2003-4 (Finnish Statistical Yearbook of Forestry 2004).

although the input varied regionally from 9.3 to 24.6 days. The return for this effort was an average 7.7 kg of moose meat per hunter per hunting day.

Until now there has been a strong correlation between the number of moose to be harvested and the number of hunters willing to hunt moose, but given the current and ongoing decline in farm numbers and the weakening demographic situation in rural areas, this paper questions whether this situation can continue for much longer. For example, in a study of 1,800 hunters in 2002 (Petäjistö et al. 2004), 25% gave time as the primary reason and 26% the second most important reason why they were not interested in taking part in moose hunting. This study also found that 22% of the moose hunters wished that the hunt was not so time-consuming.

In other studies (Petäjistö 2002, Heikkinen 2003), 60% of forest owners were found to favour a reduction of the moose population because of moose damage. Forest owners who were also moose hunters were of the opinion that the moose population was too large, and over half of this group had observed moose damage in their forests. Forest owners who did not hunt were less likely to have observed moose damage. Over 40% of the forest owners in the study felt that demands of forest owners concerning control of the moose population are not taken into account sufficiently when the number of annual moose hunting permits is determined.

Petäjistö et al. (2005) found that half of 2,400 citizens surveyed in 2004 were of the opinion that the moose population was too large. One-third of respondents considered that the moose population could be 20% less than in winter 2004 (95,000), while 10% of respondents considered that the moose population could be reduced by one-third or even more. Very few citizens (7%) hunted, but hunting was generally considered to be the only means to control the moose population. Only 3% of the respondents opposed hunting, while 5% did not give an opinion.

Moose hunting is a voluntary activity, but it is regulated by the Law on Hunting (Metsästyslaki 615/1993) under the jurisdiction of the Ministry of Agriculture and Forestry. The principal aim of the law is to ensure the vitality of the moose population. Moose hunting is managed by a central training and advisory organization for hunters that is organized locally into 15 game management

districts and 300 local-level game management associations.

Moose hunting rights belong to landowners. The law requires an integrated land area of at least 1,000 ha for a hunt. While such areas can be found on state land, private landowners rarely possess such areas. Landowners therefore "rent" their forests to hunting clubs and associations for a nominal fee or payment in kind, usually meat. Moose hunting clubs are one of the few remaining social institutions in rural Finland. The continuing decline in the number of active farms, rural depopulation, and the aging of the remaining rural population each act to weaken such institutions (Maaseutupolitiikan yhteistyöryhmä 2000).

Nevalainen and Haapanen (2002) have made a detailed study of the demographic trends in Finnish municipalities for the period 1975 – 2030. Apart from the aging of the rural population concomitant with a low birth rate and out-migration, a striking feature of the demographics is the concentration of the future population in the region surrounding the capital city, Helsinki, as well as in areas adjacent to other urban centres. Natural population growth and the effects of migration will cause the rural areas to lose between 20 and 40% of their population during the period 2000 – 2030. The relationship between these demographic effects and the current distribution of moose hunting clubs is shown in Figure 2. The areas with the greatest concentration of moose hunting clubs are those that will experience the greatest effects of demographic change and out-migration. The sparsely populated areas are those that are already experiencing the greatest effects of agricultural adjustment; i.e., widespread farm closures and extensive field afforestation (Selby and Petäjistö 1994 Selby et al. 2005). It is estimated that by 2030, 20% of the population in the sparsely populated areas and 15% of the population in the core rural areas will be over 65 years old, with a further 11% in both types of area falling in the 55 – 64 age class (Nevalainen and Haapanen 2002).

The international trade in agricultural goods has forced radical changes in Finnish farming. Since 1990 the number of active farms has declined from about 130,000 to 71,000 in 2004. By 2020, the number of remaining farms could be as few as 40,000 (Niemi and Pietola 2005). Changes in farming and other economic and demographic changes in rural areas will also affect the forest ownership structure that in turn can affect moose management. In addition, the widespread afforestation of former fields and natural forest regeneration on abandoned farmland that is associated with the decline of farming and the aging of the rural population (Selby and Petäjistö 1994, Selby et al. 2003) also creates ideal browsing conditions for moose (Heikkilä and Härkönen 1993, Heikkilä 1999).

Forty-four percent of forest owners are now in the 60+ age-group, while a further 45% are in the 40 – 59 age-group. These age groups respectively own 40 and 47% of the private forest area (Karppinen et al. 2002). Thirty-two percent of the area of private forests is currently owned by retired persons, while 33% of the private forest area is owned by farmers, and 25% by wage earners. Only half of the forest owners live permanently on their farm and one-third live in municipalities other than that in which their forest is located. These "remote owners" have an average distance of 125 km to their forests (Karppinen et al. 2002).

The on-going changes in rural society and its economy have the potential to directly or indirectly affect the future of moose management in Finland, especially given the current institutional arrangements for moose hunting. This paper examines the structure of the membership of moose hunting clubs in 2002 and assesses how current trends in rural society may affect moose management in the future. The assessment is made from the standpoint of club leaders. Club leaders are responsible for club activities and they can participate in

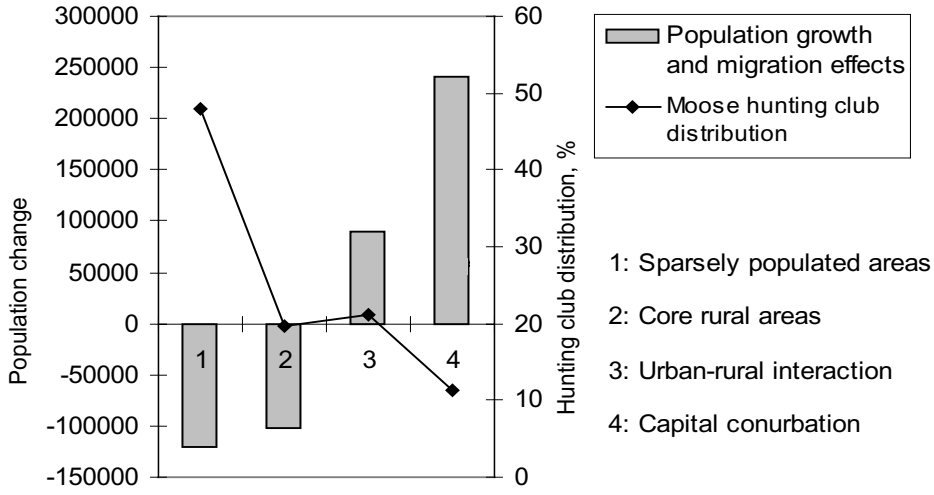

Fig. 2. Cumulative effects of population growth and migration by 2030, by types of municipality, and the current distribution of moose hunting clubs.

and have knowledge of the procedures related to the issue of moose hunting permits. It is assumed that they possess a sound overview of current club membership and activities.

METHODS

A systematic sample was drawn from 5,200 moose hunting clubs that submitted reports for the 1999 moose hunting season. The questionnaire was sent to 520 club leaders just prior to the 2002 hunting season and 327 forms (63%) were returned. The questionnaire was not mailed again to clubs that did not respond to the initial questionnaire. Some of the returned questionnaires were not fully answered. The double-sided layout of the questionnaire sometimes resulted in even-number pages being left unanswered. Consequently, the number of observations in the following analyses is less than 327.

To examine moose club membership structure, k-means cluster analysis was used. This procedure identifies relatively homogeneous groups of cases based on selected characteristics (SPSS 1997). Moose hunting club membership class percentages formed the input variables in this study. Five clusters were considered to give the best result, after which cluster membership was assigned to each case for use in the subsequent analysis.

Relations between variables were examined by cross-tabulation. The Chi-square test was applied. This test is a measure of how much the observed cell counts diverge from the expected cell counts. The null hypothesis is that there is no association between row and column variables; i.e., all categories have equal expected values (SPSS 1997, Moore and McCabe 1999). Tables in this study only report percentage values even though the Chi-square test has been applied to cell counts.

RESULTS

Membership Structure

The largest single group are the local landowners (42%) followed by non-landowning local residents (29%), while landowners' non-local relatives and friends accounted for 10% of members. The two smallest groups were non-local landowners (about 10%) and a non-specific "others" group (8%). The latter group was mainly composed of friends and colleagues that mostly hunted on state or company land. Local residents therefore

Table 1. Five-cluster solution for moose hunting club membership based on membership composition.

	Cluster centres (Club membership type)[1]						
Membership category	Mainly local residents	Mainly others	Mainly local landowners	Mainly local landowners and their relatives and friends	Mainly local landowners and residents	F^2	P
Local landowners	12.9	3.1	72.6	29.5	38.1	227.5	0.000
Local inhabitant (non-landowning)	81.7	7.4	10.7	10.2	28.6	254.6	0.000
Other landowner (not dwelling locally)	1.2	1.5	10.1	9.1	15.1	12.1	0.000
Landowners' non-local relatives, friends	2.4	0	5.3	48.2	7.8	170.4	0.000
Others (unspecified)	2.1	88.5	2	2.8	3.5	549.7	0.000
n	54	21	101	38	105		

[1] Data expressed as percentages within club type.

[2] The *F*-tests are only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. Observed significance levels are not corrected for this and therefore cannot be interpreted as tests of the hypothesis that the cluster means are equal.

account for 71% of moose hunting club members. Differences in club membership with respect to hunting methods (hunting with dogs, flushing by beaters, tracking and baiting) were not statistically significant ($\chi^2_{12} = 14.6$, $P = 0.26$, $n = 319$).

Hunting clubs and associations of clubs are created under varying circumstances – social, socio-economic, and socio-cultural, etc. The composition of club and association membership may therefore affect, directly or indirectly, the sustainability of hunting. To facilitate further analysis, a membership typology of the moose hunting clubs was constructed.

Membership Typology

Cluster analysis employing the membership groups (above) as variables resulted in 5 clusters (Table 1) that are interpreted as follows:

Mainly local residents. — Club membership consists mainly of local residents, with a few local landowners. The cluster contained 54 clubs (16.9%).

Mainly others. — Clubs in this cluster are dominated by the non-specific membership group "others". Clubs in this cluster also contain a small proportion of local residents. Other membership categories are insignificant. The cluster contained 21 clubs (6.6%).

Mainly local landowners. — This type of club is dominated by local landowners, although a small proportion of non-local landowners and local residents are present. This was the second largest cluster and contained 101 clubs (31.7%).

Mainly local landowners and their relatives and friends. — The membership of these clubs is characterised by the non-local relatives and friends of local landowners and the landowners themselves. A few local residents and other landowners can also be found in this group. The cluster consisted of 38 clubs, 11.9% of the total in the study.

Mainly local landowners and local residents. — These clubs are characterised by a strong presence of local landowners and local residents, with the occasional non-local landowners. This was the largest cluster, the 105 clubs accounting for 32.9% of clubs in the study.

Membership Trends

The majority of the moose hunting clubs

Table 2. Change in club membership over recent years, by club membership type.

	Cluster centres (Club membership type)[1]					
Change in membership	Mainly local residents	Mainly others	Mainly local landowners	Mainly local landowners and their relatives and friends	Mainly local landowners and local residents	Total[2]
Increase	11.1	38.1	11.9	7.9	10.5	12.5
No change	70.4	52.4	73.3	81.6	69.5	71.2
Decrease	18.5	9.5	14.9	10.5	20.5	16.3
Total	100	100	100	100	100	100
n	54	21	101	38	105	319

[1] Data expressed as percentages within club type.

[2] $\chi^2_8 = 16.34$, $P = 0.04$, $n = 319$.

in the investigation are over 40 years old with 58% founded in the 1960s, 21% in the 1970s, and 15% in the 1980s. Only 6% have been formed more recently.

The great majority of clubs (71%) reported that their membership figures had remained virtually the same over the past 10 years (Table 2). Of the remaining clubs, 13% reported an increase in membership and 16% reported a decrease. The trends were virtually the same ($\chi^2_8 = 3.36$, $P = 0.91$, $n = 327$) regardless of whether the clubs hunted by dogs, beaters, or both methods. However, significant differences in membership trends were found in the different membership groups (Table 2). The "mainly local landowners and their relatives and friends"-type clubs have the most stable membership – 82% reported no change in membership over the past 10 years. "Mainly others"-type clubs experienced the greatest increase in membership at some three times the average of all clubs (Table 2). The greatest decrease in membership was found in the "mainly local residents"- and "mainly local landowner"-type clubs. This result is consistent with current rural trends that are characterized by farm closures and rural depopulation.

Membership Constraints

Nearly two-thirds (60%) of the club leaders reported that applications for membership had not exceeded their membership openings. This suggests that more new members could have been admitted. On the other hand, one-quarter of the club leaders reported that their clubs had received more applications for membership than were admitted.

The "mainly local land owners and their relatives and friends"-type clubs were most likely to have had more applicants than there were openings (34%), while the "mainly local residents"-type clubs were least likely to have had more applicants than openings (17%). The difference between club types concerning the openings for membership applications was statistically significant ($\chi^2_8 = 20.72$, $P = 0.008$, $n = 316$).

It is not uncommon in social institutions that are based on actual or perceived privileges for there to be pre-conditions for group membership. Moose hunting clubs and associations are no exception. Club leaders were asked to react to a set of pre-conditions for membership that included "other pre-conditions". The most common pre-conditions were domicile in the hunting area (19%), land ownership in the hunting area (17%), and "other pre-conditions" (18%) (Table 3). Written explanations to the latter response mentioned hunting proficiency and an understanding of the hunting culture as the main pre-conditions. Twenty-two percent

of the leaders reported that their clubs did not impose pre-conditions. The imposition of pre-conditions could be a factor restricting the growth of clubs, but the relationship between pre-conditions and changes in club size as such was not found to be statistically significant ($\chi^2_{12} = 10.98$, $P = 0.53$, $n = 317$).

A significant relationship exists between the imposed pre-conditions for membership and the type of membership group (Table 3). The "mainly local residents"-type clubs were the most open with 30% having no pre-conditions, while the clubs mainly comprised of local landowners were the least open (less than 20% were without pre-conditions). Domicile in the hunting district was mostly demanded by the "mainly local residents"- and "mainly local farmers and local residents"-type clubs: a logical result. Land ownership in the hunting district was naturally an important pre-condition for the "mainly local landowners"-type club (30%) and to some extent in the other club types where landowners were prominent. Hunting proficiency and an understanding of hunting culture were also common pre-conditions, particularly by the "mainly local residents"-type and "mainly others"-type clubs (Table 3). The "mainly local landowners and their relatives and friends"-type group did not set "being a relative" as an important pre-condition, which suggests that the tacit recommendation of the landowner in question was sufficient. This interpretation is supported by the relatively high importance of the recommendation of a club member in this type of club. The recommendation of a club member as an important pre-condition for "the mainly others"-type clubs (Table 3) was a logical result given that this club type is based on comradeship.

Over half (54%) of the clubs had rejected membership applications over the past 10 years. The main reasons for the rejections were failed pre-conditions (63%), lack of trust

Table 3. Pre-conditions of moose club membership by club membership type.

	Cluster centres (Club membership type)[1]					
Membership preconditions	Mainly local residents	Mainly others	Mainly local landowners	Mainly local landowners and their relatives and friends	Mainly local landowners and local residents	Total[2]
No preconditions	30.2	27.8	19.2	21.6	20.6	22.3
Land ownership and domicile in hunting district	5.7	0	14.1	13.5	15.7	12.3
Domicile in hunting district	22.6	0	16.2	13.5	24.5	18.8
Land ownership in hunting district	0	5.6	30.3	16.2	14.7	16.8
Relative of land owner in hunting district	1.9	5.6	8.1	8.1	2.9	5.2
Recommendation of club member	5.7	22.2	4	13.5	4.9	6.8
Other (e.g., hunting proficiency)	34	38.9	8.1	13.5	16.7	17.8
Total	100	100	100	100	100	100
n	53	18	99	37	102	309
No preconditions	30.2	27.8	19.2	21.6	20.6	22.3

[1] Data expressed as percentages within club type.

[2] $\chi^2_{24} = 68.22$, $P = 0.000$, $n = 309$.

Table 4. Maintaining good-fellowship as a reason for rejecting applications for membership, by club membership type.

Maintaining good-fellowship via application rejections	Cluster centres (Club membership type)[1]					
	Mainly local residents	Mainly others	Mainly local landowners	Mainly local landowners and their relatives and friends	Mainly local landowners and local residents	Total[2]
Not important	20	9.1	35	22.2	50	33.3
Fairly important	46.7	27.3	27.5	22.2	22.2	27.5
Important	33.3	63.6	37.5	55.6	27.8	39.2
Total	100	100	100	100	100	100
n	15	11	40	18	36	120

[1] Data expressed as percentages within club type.

[2] $\chi^2_8 = 13.26$, $P = 0.10$, $n = 120$.

(26%), and a desire to limit club size (18%).

Club leaders that had rejected membership applications were asked further questions concerning the reasons for restricting membership. Of these, the most common reason (given by 24% of all the clubs in the study) was to maintain camaraderie or good fellowship. Of the "mainly other"-type clubs that had rejected applications, over 90% reported that maintaining good fellowship was an important or a very important issue when rejecting membership applications (Table 4). The result is logical given that this type of club is founded on comradeship in personal life or the work-place. The large majority of "mainly local landowners and their family and friends"- and "mainly local residents"-type clubs that had rejected applications had also done so in order to maintain good fellowship. Maintaining good fellowship was reported to be least important in the "mainly local landowners and local residents"-type clubs.

The rather "closed" nature of moose hunting clubs also extends to their acceptance of visitors. When asked how often visitors took part in the hunt, one-fifth of the clubs (22%) replied "never", while the majority (70%) replied that visitors took part "now and then". Regular visitors were reported by only 9% of the clubs. However, the difference between club types concerning their acceptance of visitors was not statistically significant ($\chi^2_8 = 11.09$, $P = 0.21$, $n = 314$).

Continuity and Sustainability

Two-thirds (65%) of club leaders in this study estimated that in 2002 the average age of their members was in the 40 – 50 year age group, whilst 30% estimated that the average age of members was in the 50 – 60 age group. Less than 4% estimated that their members' average age was < 40 years. The difference in the distribution of age classes between club types was not statistically significant ($\chi^2_{12} = 18.80$, $P = 0.094$, $n = 318$).

The "mainly local landowners and their family and friends"-type clubs had the lowest average age while the "mainly local landowners"-type clubs had the highest average age. Whether this result is indicative of an attempt to rejuvenate the "mainly local landowner"-type clubs cannot be ascertained at this juncture. Regional variations in the mean age of membership are also observable – clubs with the youngest mean age are found in eastern and northern Finland (Selby et al. 2005).

Over one-third (35%) of the club leaders considered that the increase in the proportions of older members was already affecting moose hunting activities, either because active members were now fewer (22%) or because elderly members were finding the hunt to be

too physically demanding (13%) (Table 5). The remaining 65% considered that aging had not yet affected hunting activities or that new members had maintained the mean age of members.

The clubs least affected by age were the "mainly landowners and their relatives and friends"- and "mainly local residents"-types (50% and 48%, respectively). Conversely, the effects of aging were most often found in the "mainly others"-type clubs (45%) and the mainly landowner and local residents-type clubs (40%), but the club types with a strong landowner component also show signs of aging (Table 5). With the exception of the "mainly others"-type club, this result would be consistent with aging of the farming population.

New membership was reported to offset the effects of aging in a quarter of the clubs in the study. The most successful in this respect were the "mainly local residents"- and "mainly local landowners"-type clubs (29.6% and 27.8%, respectively). One-fifth of the other club types reported benefits from new, younger members.

Club leaders were asked about young people's interest in moose hunting (young people are not to be confused with "younger members", which often means the middle-aged). From the standpoint of the future social renewal of moose hunting clubs, the answers were not encouraging. Only 10% of club leaders reported that "several" young people had expressed interest in moose hunting, while 58% reported a very limited interest ("one or two" young people) (Table 6). Fairly large differences exist between club types concerning the participation in the hunt of young members. The greatest youth activity is found in the "mainly local residents"-type clubs, of which 15% reported that there were "several" interested young people, while a further 49% reported that one or two young people were interested in hunting. Nearly two-thirds of the "mainly local land owners"-type and "mainly local land owners and local residents"-type

Table 5. The effect of aging membership on moose hunting club activities, by club membership type.

	Cluster centres (Club membership type)[1]					
Aging problem	Mainly local residents	Mainly others	Mainly local landowners	Mainly local landowners and their relatives and friends	Mainly local landowners and local residents	Total[2]
1-Age has reduced active membership	14.8	35	18.6	19.4	26.9	21.9
2-Age has caused hunt to be too physically demanding	7.4	10	17.5	11.1	13.5	13.2
Sub-total 1+2	22.2	45	36.1	30.5	40.4	35.1
3-New, younger members maintain the average age of club	29.6	20	27.8	19.4	21.2	24.4
4-Increase in average age of members has not brought changes in activities	48.1	35	36.1	50	38.5	40.5
Sub-total 3+4	77.7	55	63.9	69.4	59.7	64.9
Grand Total	100	100	100	100	100	100
n	54	20	97	36	104	311

[1] Data expressed as percentages within club type.

[2] $\chi^2_{12} = 11.98$, $P = 0.45$, $n = 311$.

Table 6. Young peoples' interest in moose hunting, by club membership type.

	Cluster centres (Club membership type)[1]					
Interest of young people in hunting	Mainly local residents	Mainly others	Mainly local landowners	Mainly local landowners and their relatives and friends	Mainly local landowners and local residents	Total[2]
Several	15.1	4.8	9	7.9	8.6	9.5
One or two	49.1	38.1	63	52.6	64.8	58.4
None	26.4	28.6	26	31.6	24.8	26.5
Cannot say	9.4	28.6	2	7.9	1.9	5.7
Total	100	100	100	100	100	100
n	53	21	100	38	105	317

[1] Data expressed as percentages within club type.

[2] $\chi^2_{12} = 32.64$, $P = 0.001$, $n = 317$.

clubs as well as half of the "mainly local residents"-type and "mainly local land owners and their relatives and friends"-type clubs reported that one or two young people were interested in hunting. The clubs in which young people showed the greatest interest were also those with the youngest average age of members ($\chi^2_9 = 29.0$, $P = 0.000$, $n = 323$).

DISCUSSION

The rationalization of Finnish agriculture will result in a drastic reduction in the number of farms over the next two decades. Much farmland will be either reforested or left to natural regeneration, thereby providing ideal conditions for moose. Demographic projections indicate that the rural areas will continue to experience rural depopulation resulting in a reduced and aged rural population by the year 2030. This trend could easily result in a situation where many of the resident landowners will no longer be physically able to participate in the annual moose hunt, while the remaining active farmers may be too few to provide the 100,000 or so hunters required annually for the management of moose even at current population levels. Recall that an average input of 16.5 man-days/moose is required during the period from October to December. This period is characterised by increasingly dark, late autumn and winter conditions, often with low temperatures and deep snow. Hunting under such conditions is arduous and requires good physical fitness.

The current membership situation is stable, but warning signals seem to be present. The largest single group of moose hunters are local landowners who are most threatened by changes in the rural economy and the aging process. The first signs of the effects of aging on hunting activities are also observable. Further, young people do not seem very interested in hunting, as reported elsewhere (Vikberg et al. 2002). This in turn may be a side effect of the aging process because the clubs in which young people showed the greatest interest were also those with the youngest average age of members.

Another cause for concern is the closed nature of moose hunting clubs – a fact that is affecting their social renewal. By imposing strict membership pre-conditions it would seem that landowners are seeking to preserve their perceived power or privileges – a behavioural pattern recognized in a number of studies of rural society (e.g., Mormont 1990, Marsden et al. 1993). Supporting this argument, Koskela (2004) has found that the majority of forest-owning moose hunters were totally opposed to the idea of an even limited

commercialisation of hunting rights.

New moose hunting clubs are also rare, and while this may indicate that there are sufficient clubs at present, it may reflect the fact that the current moose hunting legislation is weighted towards landowners. This, and the landowners' protection of their hunting privileges, may act to restrict the opportunities for new club formation.

There is, then, a cumulative set of processes that does not bode well for the sustainability of moose hunting in its present form. On the other hand, as society changes and becomes increasingly detached from rural areas, and land ownership becomes concentrated in absentee urban dwellers' hands, there may well be an increased demand for moose hunting opportunities by non-residents and non-landowners that seek to maintain ties to their family roots or who are otherwise interested in hunting. To accommodate this new demand, the pre-conditions for moose hunting club membership may need to be relaxed. Alternatively, new rural land leasing arrangements may be required to enable new urban-based moose hunting clubs to operate.

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