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## Promoting hunting tourism in north Sweden: opinions of local hunters

Tomas Willebrand

**Abstract** Hunting tourism can help to diversify local economies in rural areas. In northern Sweden, hunting tourism has the potential to counteract outmigration and unemployment, but may entail ecological and social risks. I used a mail survey of 2,110 hunters in rural northern Sweden to assess attitudes toward hunting tourism. Respondents emphasized the importance of hunting to maintain economical, social, and cultural values in the rural areas. Most hunters estimated that game contributed equal or larger amount of meat to their household than meat bought commercially. Few respondents had first hand experience of hunting tourism and they were divided on their attitude towards promoting hunting tourism. Many (46%) were uncertain about their attitude towards hunting tourism; 36% were positive and 18% were negative. Ethical values on using wildlife in hunting tourism and the attitude towards new hunters coming to hunt influenced attitudes on development of hunting tourism. Hunters that were positive to hunting tourism believed that it would create new jobs. Because hunting in Sweden is highly organized and collective, there are no models of hunting tourism adapted to the hunting culture in northern Sweden. The uncertainty of the potential local benefits from a development of hunting tourism should be placed within a research framework, especially in the northernmost parts where governmental undertakings are large and the state can influence land use.

**Keywords** Rural development . Attitudes . Questionnaire . Adaptive co-management

### Introduction

The 200,000 km<sup>2</sup> region of northern Sweden constitutes almost 50% of Sweden, but <4% of the population resides here. The economies of the sparsely populated communities, excluding coastal municipalities, have been dependent on resource extraction (mining, hydropower, and forestry). However, technological development and increased mechanization has reduced the need for labor. Employment in the forestry sector has decreased by about 50% since 1985 (Lundgren 2005). Currently, these communities depend on employment in the public sector such as health care, schools, and administration (Kniivilä and Saastamoinen 2002). The region has a declining depopulation and an aging populace despite support from governmental undertakings at different levels (Wiberg 2005). Natural resources are obvious assets for tourism and regional development in the region but, although several regional tourist programs have been initiated, it has not been able to counteract negative development (Lundmark 2006).

Wildlife is associated with significant consumptive and recreational values (Swanson et al. 1989; Snepenger and Bowyer 1990; Mattsson 1990; Rockel and Kealy 1991; Condon and Adamowicz 1995; Reid 1999) which can be realized through consumptive harvest or recreational tourism. In Canada, hunter tourists contributed about \$30 million (US) in direct revenue in 1994 (MacKay and Campbell 2004). Hunting tourism contributed to the direct employment of 12,000 full-time equivalents in UK, and the total gross and net expenditures for deer stalking were estimated as £14 million and £5 million, respectively (Murray and Simcox 2003). Hunting tourism can diversify local economies in rural areas and increase protection of important habitats, but may entail ecological and social risks. Increased

commercial value could increase harvests to unsustainable levels (Milner-Gulland and Akcakaya 2001) and may create incentives for illegal predator control. Furthermore, the harvest potential of many species may already be used for subsistence by rural communities. Berkes et al. (1994) showed that the replacement value of the bush food harvested in Mushkegowuk region of the Hudson and James Bay Lowland in Canada was about \$7.8 million in 1990. Hunters and non-hunters support consumptive hunting more than hunting for recreation (Heberlein and Willebrand 1998; Zinn et al. 1998). Therefore, hunting tourism may have little support as a legitimate use of wildlife. Traditional hunting in rural areas is often seen as a natural part of the cultural landscape (Stedman and Heberlein 2001). New policies and regulations may be perceived as illegitimate changes of the rules governing hunting and a potential threat to local traditions (O'Brien 2005; Kianicka et al. 2006).

In rural Sweden, hunting maintains economic, social, and cultural values. Moose hunting is the most important form of hunting because of its economic value (Mattsson 1990; Storaas et al. 2001) and social function (Heberlein 2000). In rural parts of northern Sweden, 38,800 moose were harvested in 1998 (>0.8 moose for each hunter), and most households use meat from game at least once a month (Ericsson et al. 2005) despite the lack of a hunter in some of the households. Most hunters in these parts lease land to hunt, and many are members of local Hunting Management areas or hunting clubs. Hunting Management areas are designed to promote long-term management, and small landowners can be forced to join these cooperatives (Bergström et al. 1992).

Hunting tourism is uncommon in northern Sweden, and attempts to establish hunting tourism has been met with strong skepticism by local hunters in several instances since the early 1990s. The most common arguments are exclusion of local hunters, increased lease land fees, and overharvest. Strong local opposition makes large forest companies reluctant to change their land lease policy for hunting, especially since the potential income from fees is only marginal. Hunting tourism continues to attract interest from policy makers despite few examples of success, and in 2004 the largest forest company (45,000 km<sup>2</sup>) was directed to actively promote nature, fishing, and hunting tourism by its owners where the Swedish state is the major shareholder. There are no previous studies that have quantified the attitude of local hunters towards the development of hunting tourism, and hunters' opinions may be affected by their concern for future wildlife abundance and hunting possibilities, local norm-setting hunting traditions, and a need for local economic development and creation of employment opportunities. I present a study where demographic factors, beliefs on hunting, and social values were used as explanatory characteristics to hunters' opinion about increasing support for the development of hunting tourism.

## Methods

This study is part of a project aimed at estimating the potential for hunting tourism in the Swedish area eligible for European commissions structural funds Objective 6 ([ec.europa.eu/regional\\_policy/atlas/sweden/se\\_en.htm](http://ec.europa.eu/regional_policy/atlas/sweden/se_en.htm); Lundmark and Bergsten 1998). Objective 6 is now a part of Objective 1. An advisory group included the Swedish Hunting Organization, forestry companies, hunting tourist operators, and local hunting interests. Three mail surveys were developed; one directed to hunters living in the area, one directed to the chairmen of the local hunting organizations, and one to known hunting tourism operators (187 individuals).

In this study, I used a direct mail survey of hunters selected from a total hunter population of 52,007 from the area defined in Objective 6. The population was stratified in five sub-regions based on county borders, and hunters were sampled in proportion to the number of hunters in each region. The questionnaire contained 68 questions (18 pages on A4) and was mailed in March 1999 after the hunting season of 1998/1999. A total of 2,110 questionnaires were sent out and 1,352 were returned (64%). Two reminders were sent out to non-respondents 3 and 6 weeks after the initial contact. Hunting tourism was defined as a commercial operation that could provide access to guide, dogs, necessary equipment, food, and lodging.

Questions were divided in three categories: (I) Demographic factors (n=6); (II) hunting preferences (n=27); and (III) attitudes towards hunting tourism in their commune (n=35) (Swedish smallest administrative unit). The response variable was whether they would be positive, uncertain, or negative to the development of hunting tourism. The first part of my analysis focused on three questions from category I: age, sex, and region of residence; eight from category II; and eight from category III (see [Appendix](#)). The survey included several statements on a four-point scale as a measure of whether they agreed or not (e.g., II.k, III.c–f; [Appendix](#)). These answers were pooled into agree or disagree in the statistical analysis.

I used a Pearson's  $\chi^2$  test to evaluate if positive, uncertain, and negative hunters were statistically independent from the alternative answers in the 19 questions described above. I calculated the contribution of each cell to the total  $\chi^2$  when the test showed a statistically significant dependence. I wanted to evaluate how well I could discriminate between positive, negative, and uncertain hunters using the total set of questions, and which questions contributed most to the classification. I used the non-parametric random forest method (RF) to rank the variables in importance to classify hunters' response (Breiman 2001; Liaw and Wiener 2002). RF is based on classification and regression trees (Breiman et al. 1984). Each tree is built on a bootstrap sample containing about 64% of the observations, and the remaining 34% ("Out Of the Bag"; OOB) is used for prediction. All OOB predictions are aggregated and the error rate is calculated. I used the weighted mean of the individual trees' improvement in the splitting criterion by each variable (Gini importance). The random forest contained 500 trees and six variables tried at each split. I used program R for all data handling and analyses (R Development Core Team 2005).

## Results

The average age was 50 years for men and 42 for women (6% of respondents were female); sex did not influence the opinion towards hunting tourism but there was a strong effect from age (Table 1). Young and especially middle age respondents were less uncertain and more positive than older (>50 years) hunters. Respondents in the two most northern counties were more positive and less negative to development of hunting tourism than respondents further south (Table 1).

Most respondents had been hunting for >10 years (77%) and hunted within the community where they lived (80%) on land which was owned by either the state or a larger forest company (87%; Table 2). Respondents that hunted for >10 years were more negative or uncertain to the development of hunting tourism than those with shorter experience. Most respondents spent >10 days hunting in 1998 (75%), and were either satisfied with the amount of time or could not spend more time (90%). The respondents which said they were constrained by lack of money or access to land were more negative and less uncertain to

development of hunting tourism than other hunters. Two thirds estimated their annual expenditure on hunting to less than 5,000 SEK (1998), about 529 €(Table 2).

Moose hunting was important and 86% participated in moose hunting in 1998, and 57% spent most of their time on moose hunting. Meat from game was an important contribution to the household to more than two thirds of the hunters (Table 2). A large majority (75%) were very dedicated to hunting and could not see any other activity which could replace hunting. Only a few hunters had been hunting with a guide (4%), and they were mostly positive to the development of hunting tourism. All respondents (>95%) agreed with the statement that hunting was an important part of the social and cultural traditions in rural areas.

More respondents agreed than disagreed to the statement that tourism would become an important source of employment in the future, although the majority only saw it as an uncertain possibility (47%). These beliefs also explained a large part of the opinions towards the development of hunting tourism (Table 3). Of the positive hunters, 71% believed that new job opportunities would be the most positive effect of developing hunting tourism but most (72%) of the negative hunters did not believe in any positive effects (new jobs or better wildlife management). Few respondents believed that hunting tourism was comparable to other tourism activities (28%), and more hunters were either doubtful or believed it to be unacceptable to sell hunting as a tourism activity (48%). Few in the latter two groups were positive to the development of hunting tourism (Table 3).

Most hunters agreed to the statement that hunting tourism would lead to poorer hunting quality for local hunters (79%) and reduced abundance of wildlife (65%). The majority of respondents that disagreed with these statements were positive to the development of hunting tourism (Table 3). However, less than 10% of all respondents saw a reduction in game abundance as the most negative potential factor following an increased hunting tourism, and identified increased social tension and increased hunting costs as the most important factors (57%). Few hunters agreed to the statement that it would be positive to see more foreign hunters visit their county as hunter tourists (37%) or Swedish tourist hunters in their hunting teams (42%). Almost none of the negative (<8%) and few uncertain (<37%) respondents agreed with these statements (Table 3).

Overall, most hunters were uncertain (46%) about a development of hunting tourism in their commune; 36% were positive and 18% were negative. The discriminant analysis (RF) classified the three categories with an OOB error rate of 35% using 44 of the 68 variables in the questionnaire (Table 4). The largest error was recorded for the negative class with large overlap with uncertain hunters (67%). Positive respondents also overlapped with uncertain hunters but significantly less so (29%). Thus, there was a substantial difference in the answers from positive and negative respondents but the uncertain and negative respondents were difficult to tell apart based on their answers. The most significant questions were age, region (Table 1), and beliefs about tourism as a source of employment (III.a), ethical approval of hunting tourism (III.b), and view on more foreign hunters in the commune (III.e; Table 3). The question on ethical approval of hunting tourism was the most important. Keeping only these five variables in the RF model increased the OOB error rate to 38%, mostly due to larger errors between uncertain and negative respondents.

There was an interaction with age and the three variables III.a, III.b, and III.e. The two older age groups were more likely to disagree (73%) with the statement that more foreign hunters in the commune would be positive ( $\chi^2=52$ ,  $df=3$ ,  $P<0.001$ ), to view selling of hunting as unethical ( $\chi^2=88$ ,  $df=9$ ,  $P<0.001$ ), and to disagree with the statement that tourism in general would be an important source of future employment ( $\chi^2=57$ ,  $df=6$ ,  $P<0.001$ ).

Variables addressing hunting activities and preferences were generally associated with a low ranking (Table 2). Typical examples were whether or not hunters hunted close to where they lived, if they regularly used game meat in their households, or the amount of time spent hunting annually.

## Discussion

Most respondents were uncertain in their support of developing hunting tourism in their commune. Uncertain respondents shared more views with the negative rather than with the positive respondents, and it will probably require more convincing arguments to influence the uncertain hunters to become positive than negative. The most important question to discriminate the attitudes towards the development of hunting tourism was whether selling hunting could be considered ethical or not. The motives of hunting are important for its acceptance. Hunting for recreational and fun receive low acceptance by hunters and non-hunters worldwide (Heberlein and Willebrand 1998; Radder 2005). The ethics of hunting have kept recurring for a long time (e.g., Leopold 1981; Ortega y Gasset 1985; Nelson et al. 2005), and there are many formal and informal rules of conduct to reduce the suffering of the animal. A concern that hunter tourists will not adhere to these rules and represent hunters that hunt for recreation and fun is likely one of the most important factors for the uncertainty towards hunting tourism.

Many respondents believed that hunting quality and wildlife abundance would decrease following an increase in hunting tourism but did not see these as the most negative factors. Instead, increased social tension and conflicts were ranked the highest. The collective moose hunting has become an increasingly important event in the rural areas of northern Sweden during the last 60 years, and resident hunters or those with strong ties to the land are prioritized when adding members to the local hunting organizations (Bergström et al. 1992). Most hunters in this study were long-term members of a local hunting organization and had hunted in the same area for many years. The highly organized moose hunting has formed cultural traditions and social norms which probably extend outside the hunting community (Henning 1990; Greider and Garkovich 1994; Fell 2006), and a small change in the policy of leasing hunting rights by the large forest companies could result in large changes for the social life in many rural areas. An increased hunting tourism is probably seen as a threat to the stability of the long-standing traditions of local hunting teams by many hunters, which could reduce their possibility to make decisions on their hunting. Local hunting teams have for a long time voiced the risk to be excluded from hunting if the large landowners secured land for exclusive hunting tourism. As this study shows, local hunters would then lose one of the most important factors for their well being, and would have great difficulties finding an interest that could replace hunting.

Increased costs of hunting was seen as the second most negative risk with an increased hunting tourism. The cost of hunting in this study was comparatively low despite that meat from game was a substantial part of their household consumption. Earlier studies showed a positive discrepancy of how much hunters valued their hunting in economical terms compared

the cost of leasing land to hunt (Mattsson 1990; Bergström et al. 1992). This was followed by a debate on price regulation on hunting fees, and the Swedish Hunters Organization was commissioned by the parliament to evaluate the need for state regulation of fees for hunting lease in 1993. After extensive discussions, it was decided to avoid a price regulation, but it was emphasized that fees should be kept at reasonable levels. A development of hunting tourism is probably seen as counterintuitive to this conclusion and could remove the incentives for the longstanding tradition to participate in management and monitoring activities without reimbursement.

The perceived large risks to local hunters' traditional way of living could probably be moderated if an increase in local employment and economical development would follow the establishment of hunting tourism. The two northern regions in this study have higher unemployment and a larger public sector than the other parts, and the hunters in these regions were more positive to hunting tourism. A decrease in public service following decreased employment and population levels is evident in many rural communities of northern Sweden. Younger hunters were more positive to the development of hunting tourism, and are probably more concerned with future employment than older hunters. However, the potential of hunting tourism to create new employment in the local community remains unknown, and even today there are more examples of failures than success.

The principle of adaptive management is a common approach when uncertainty is high in wildlife management, and Willebrand et al. (2006) discussed the problem when stakeholders have to agree on policy decisions under large uncertainty of potential outcomes. They emphasized the need to formally evaluate policies before large-scale implementation, and emphasized the consensus on criteria for success and failure before evaluation. It will also be essential to agree on steps to be taken when a policy is deemed a failure. The question whether to support the development of hunting tourism could be placed within this framework in a research program, especially in the northernmost part where governmental undertakings are large and the state can influence land use.

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## Tables

**Table 1** The respondents' opinions to the development of hunting tourism (positive [+], uncertain [0], negative [-]) dependent on sex, age, and place of living

	N	Opinion		
		+	0	-
<b>Sex</b>				
Female	71	45	39	16
Male	1,172	36	46	18
<b>Age of hunter: <math>\chi^2=38</math>, <math>df=6</math>, <math>P&lt;0.001</math></b>				
<35 years	234	41	43	16
35–50 years	450	44	40	16
51–67 years	390	30	49	21
>67 years	169	21	59	20
<b>Region of the study area: <math>\chi^2=28</math>, <math>df=8</math>, <math>P&lt;0.001</math></b>				
South-west	198	24	55	21
South-east	165	30	49	21
Middle	352	37	41	22
North	273	42	45	13
Far north	343	39	46	15

N is the number of respondents in a specific category (row), and opinion is shown as percentage within that row.  $\chi^2$  statistic from contingency table analysis is presented where statistically significant ( $P<0.10$ )

**Table 2** The respondents' opinions to promote the development of hunting tourism (positive [+], uncertain [0], negative [-]) dependent on attitudes and hunting experience

	N	Opinion		
		+	0	-
II.a Years as hunter: $\chi^2=13$ , $df=6$ , $P<0.04$				
<6 years	104	47	36	17
6–10 years	131	40	49	11
11–20 years	311	36	44	20
>20 years	702	33	48	19
II.b Hunting in commune of residency				
No	195	35	46	18
Yes	1,110	41	44	15
II.c Hunting rights				
Own land	167	37	42	21
Leased land	1,129	35	47	18
II.d Hunting days				
<11 days	330	35	49	16
11–20 days	382	34	45	21
>20 days	612	37	45	18
II.e Allocate more time to hunting: $\chi^2=5.8$ , $df=2$ , $P=0.05$				
No, time constraint	1,147	36	47	17
Yes, money or land constraint	127	35	39	26
II.f Annual cost of hunting				
<211 €	446	37	45	15
211–528 €	552	32	49	19
529–1,055 €	226	38	47	15
>1,056 €	83	47	32	21
II.g Importance of game meat				
Important	883	35	45	20
Not important	428	37	48	15
II.h Hunting preferences: $\chi^2=4.9$ , $df=2$ , $P=0.09$				
Generalist	570	39	43	18
Moose	746	33	48	19
II.i Hunting important for well being				
No	445	36	45	19
Yes	851	36	47	17
II.j Committed to hunting: $\chi^2=5.0$ , $df=2$ , $P=0.08$				
Weak (3+4)	334	32	51	17
Strong (1+2)	975	38	44	18
II.k Hunted with guide: $\chi^2=21$ , $df=2$ , $P<0.001$				
No	1,253	35	46	19
Yes	55	65	31	4
II.l Hunting important in rural areas				
Yes, agree	1,186	37	45	18
No, disagree	100	25	47	28

N is the number of respondents in a specific category (row), and opinion is shown as percentage within that row.  $\chi^2$  statistic from contingency table analysis is presented where statistically significant ( $P<0.10$ ). See Appendix for a translation of the specific question II.a–l

**Table 3** The respondents' opinions to promote the development of hunting tourism (positive [+], uncertain [0], negative [-]) dependent on attitudes towards tourism

	N	Opinion (%)		
		+	0	-
III.a Tourism is a future employment source: $\chi^2=108$ , $df=4$ , $P<0.001$				
Yes, agree	512	48	29	13
Possibly	609	32	51	17
No, disagree	184	12	49	39
III.b Ethical approval of hunting tourism: $\chi^2=389$ , $df=6$ , $P<0.001$				
Similar to all other tourism	366	73	22	5
Doubtful, not even comparable to fishing tourism	364	24	53	23
Unacceptable to sell hunting to make money	259	11	49	40
I have no opinion	307	25	64	11
III.c Hunting tourism will lead to poorer hunting quality of local hunters: $\chi^2=95$ , $df=2$ , $P<0.001$				
Yes, agree	975	29	49	22
No, disagree	262	61	32	7
III.d Hunting tourism will lead to lower abundance of wildlife: $\chi^2=109$ , $df=2$ , $P<0.001$				
Yes, agree	805	26	51	23
No, disagree	436	55	35	10
III.e Positive to foreign hunter tourists: $\chi^2=251$ , $df=2$ , $P<0.001$				
Yes, agree	478	65	31	4
No, disagree	815	19	54	26
III.f Positive to Swedish hunter tourists in the area where I hunt: $\chi^2=182$ , $df=2$ , $P<0.001$				
Yes, agree	516	57	36	7
No, disagree	710	21	53	26

N is the number of respondents in a specific category (row), and opinion is shown as percentage within that row.  $\chi^2$  statistic from contingency table analysis is presented where statistically significant ( $P>0.10$ ). See Appendix for a translation of the specific question III.a-f

**Table 4** The out of bag (OOB) error rate classifying the hunters as positive, uncertain, or negative to the promotion of hunting tourism in their commune

	Positive	Uncertain	Negative	OOB error rate
Positive	233	95	2	29%
Uncertain	75	305	103	27%
Negative	6	103	55	67%

True values are in rows and predicted in columns. The overall error rate was 35%. Notice the large overlap between uncertain and negative hunters when compared with positive hunters

## Appendix

**Table 5** The questions and the alternative responses for the questions used in major analysis

Id	Question	Alternatives
	What is your personal opinion about increasing support for the development of hunting tourism, if local hunting traditions were taken into consideration? (Response variable)	(1) Positive (2) Uncertain (3) Negative
II.a	For how many years have you held a state hunting license?	<6 years, 6–10 years, 11–20 years, >20 years
II.b	In 1998, did you mostly hunt in the commune where you are registered as resident?	(1) Yes (2) No
II.c	In what type of hunting unit did you mostly hunt during 1998?	(1) Own property (2) Other types, e.g., leased land
II.d	How many days did you go hunting in 1998?	<10 days, 11–20 days, >20 days
II.e	How do you view the time you allocate to hunting?	(1) I would like to hunt more but cannot afford it or am unable to find land to hunt (2) I could not spend more time on hunting than I do today
II.f	How much would your expenditures be reduced by if you stopped hunting all together?	<211 €, 211–528 €, 529–1,055 €, >1,055 €
II.g	How important is the game meat you harvest for your household's meat consumption?	(1) It is very important. It is the majority of the meat that we consume (2) It is important. We eat equal amounts of meat from game as bought commercially

**Table 5** (continued)

Id	Question	Alternatives
		(3) It is not so important to the household economy but we would miss its contribution (4) It is not important and we would not miss it
II.h	How large a proportion of the time you allocated to hunting in 1998 did you spend moose hunting?	(1) 0–60% (2) 61–100%
II.i	Is the possibility to hunt within the commune where you live one of the most important factors for your well being?	(1) Yes (2) No
II.j	For some people hunting is the most important part of their life. For others it is one of several interests. Some also view it as something they enjoy but is not particularly important. What is your opinion?	(1) I would miss hunting very much if I was unable to continue hunting. None of my other interests could replace hunting (2) I would miss hunting if I was unable to continue hunting, but some of my other interests could probably replace it (3) I would be dissatisfied if I was unable to continue hunting. I would miss hunting but not as much as if I had to give up any of my other interests (4) I would find something else to do if I could not continue hunting. I am convinced that I would like my new interest as much as hunting. I would not miss hunting
II.i	Have you ever hunted with a hunting guide in Sweden or abroad?	(1) Yes (2) No
II.k	Hunting is very important for subsistence and recreation to people	(1) Agree completely (2) Agree (3) Disagree (4) Disagree completely

	living in the rural areas	
III.a	Do you believe that a general promotion of tourism would increase	(1) Yes (2) Possible  (3) No
	the number of employment opportunities within your commune?	(3) No
III.b	How do you view the selling of hunting to make a living?	(1) Unproblematic, it is similar to any form of tourism (2) Problematic, it cannot even be compared to fishing tourism (3) It is unacceptable to sell hunting to make money (4) I have no opinion
III.c	An increase in hunting tourism will lead to poorer quality hunting for local hunters	(1) Agree completely (2) Agree (3) Disagree (4) Disagree completely
III.d	An increase in hunting tourism will lead to a lower abundance of wildlife	(1) Agree completely (2) Agree (3) Disagree (4) Disagree completely
III.e	It would be positive if we received more hunter tourists from other countries	(1) Agree completely (2) Agree (3) Disagree (4) Disagree completely
III.f	I would like to have Swedish hunter tourists come to the area where I hunt	(1) Agree completely (2) Agree (3) Disagree (4) Disagree completely

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The Id refer to the results in Tables 2 and 3