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Authors: Hansson-Forman, Katarina, Sandström, Camilla, and Ericsson, Göran

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What influences hunting participation of potential new hunters? Qualitative insights from Sweden

Katarina Hansson-Forman, Camilla Sandström and Göran Ericsson

K. Hansson-Forman ✉ (katarina.hansson@umu.se) and C. Sandström, Dept of Political Science, Umeå Univ., Biblioteksgränd 6, SE-90187 Umeå, Sweden. – G. Ericsson, Dept of Wildlife, Fish and Environmental Studies, Swedish Univ. of Agricultural Sciences, Umeå, Sweden.

Hunting, an activity conceptualized as part of wildlife management partnership between the state, landowners and hunting communities, is increasingly challenged by a decreasing hunter base. This has ecological, economic and socio-cultural consequences, and the issue of hunter recruitment deserves more scholarly and political attention. In Sweden, the number of individuals taking a hunting proficiency test is high even though the number of hunters has declined during the last few decades although with a recovery the last 12 months, indicating an under-utilized source of potential new hunters. We explore in an interview study with potential new hunters in Sweden what factors affect and motivate individuals to take the hunter proficiency test and to hunt. Our thematic analysis identifies structural, institutional and individual factors influencing hunting participation, such as social networks and access to land, rendering two ideal types of new hunters. We offer suggestions to help curb the negative trend of declining hunter numbers and we identify research gaps for future studies to address.

Keywords: hunting, management, proficiency test, recruitment, wildlife

The declining number of active hunters (Decker et al. 2012) has been identified as a growing problem world-wide (Ryan and Shaw 2011, Hansen et al. 2012, Andersen et al. 2014, U.S. Fish and Wildlife Service 2016, Eriksson et al. 2018). According to the hunter recruitment and retention (HRR) literature, a decline in hunters can have major ecological, economic and socio-cultural consequences (Larson et al. 2013). Management of wildlife in production landscapes require regular harvest as wildlife populations may cause problems such as disease outbreaks and biodiversity reduction (Messmer 2000), and damage to crops, forests and vehicle collisions incur high costs that may be mitigated by hunting (Messmer 2000, Larson et al. 2013). A decline in hunters can lead to less revenue and taxes through the sales of hunting gear and hunting opportunities (Arnett and Southwick 2015, Mensah and Elofsson 2017).

Socio-culturally, when hunters provide meat to the larger society outside the hunting community, hunting constitutes a socio-cultural bridge between urban and rural communities, upholding not only the importance of rural activities to urban communities but also gaining public acceptance and support for hunting and wildlife management activities (Ljung et al. 2015). It is argued that a decline in hunters also leads to a general dissipation of hunting culture (Ryan and Shaw 2011, Price Tack et al. 2018), as recruitment require time for socialization into a hunting community (Littlefield and Ozanne 2009). Individuals already within a hunting community are more likely to recruit new hunters (Larson et al. 2013), but this will be impeded if the hunting culture is breaking down. Another challenge is that the role of hunters as ecosystem stewards may change (Lindqvist et al. 2014).

An often overlooked effect is the negative impact declining numbers of hunters can potentially have on wildlife management. In many countries, wildlife management is carried out by a partnership between landowners, hunting communities/organizations and the state. Various forms of such partnerships can be found around the world (Brainerd and Kaltenborn 2010, Helle et al. 2016), and common to these models is the vital role that hunters play. Fewer hunters can lead to the breakdown of institutional arrangements such as lack of funding for wildlife management, decreased legitimacy, lower capacity in implementation, and erosion of urban–rural relationships (Decker et al. 2012, Larson et al. 2014, Eriksson et al. 2018). There is a lack of in-depth knowledge about HRR in the Swedish partnership model for wildlife management and, from a Euro–American perspective, we suggest that Sweden provides an interesting case study for exploring the issues facing HRR.

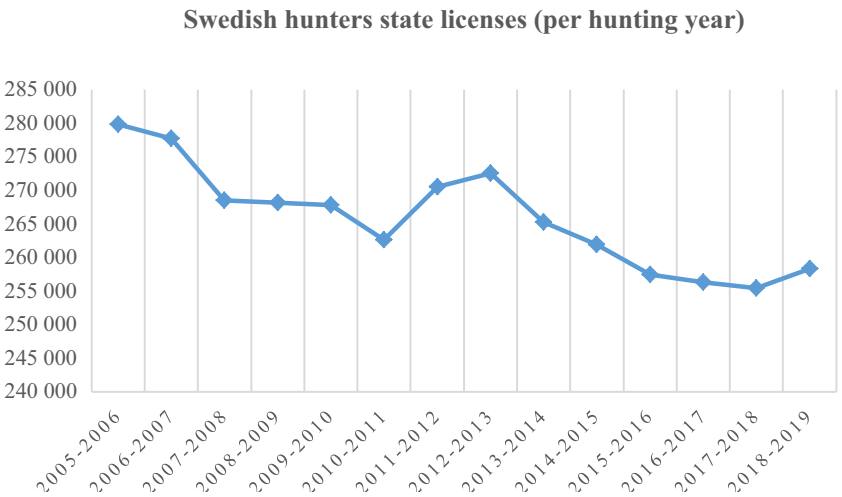

Figure 1. Number of Swedish hunting licenses sold to Swedish hunters between 2005 and 2019.

To have the right to hunt and to apply for gun license for hunting, you need to pass a theoretical and a practical test in Sweden. In addition, each individual hunter pays an annual mandatory hunting fee to the state, termed state-owned hunting license (Swedish Environmental Protection Agency 2019a). Over a ten year period, the number of state-owned hunting licenses paid has decreased by about 7%, or about 20 000 hunting licenses, which translates to an annual income loss of SEK 6 million (approx. €600 000) (the number of hunters has started to increase again during 2019, after an institutional intervention where payment information was sent out more frequently, as a measure of reactivation, Swedish Environmental Protection Agency 2019b, Fig. 1). An increase in the number of foreign hunters may partially fill the gap left by declining numbers of Swedish hunters (Fig. 2), for example in terms of revenue for the state. However, with a fly-in–fly-out approach, these hunters will be focused primarily on the hunting and will probably not assume any responsibility for wildlife management. During the same period, the number of new potential hunters, i.e. people taking the hunting proficiency test, has almost doubled (Eriksson et al. 2018). This suggests that an aging hunter population cannot solely explain the decreasing number of hunters, and that other factors come in place. Hence, we explore what factors that are both enabling and hindering individual potential new hunters to understand if and how new hunters can be recruited, to maintain the partnership model.

Factors determining hunter participation

Structural factors

Structural factors to HRR include issues relating to societal economic and political trends, such as demographic changes (Heberlein et al. 2002, Ryan and Shaw 2011, Hansen et al. 2012), urbanization (Heberlein and Ericsson 2005) and social networks (Larson et al. 2014). The global demographic transition towards an older and urban population is assumed to be a key driver of change in hunter demographics (Decker et al. 1984, Hansen et al. 2012). This transition may create potential structural barriers to new hunters, such as distance to hunting land or socio-economic status

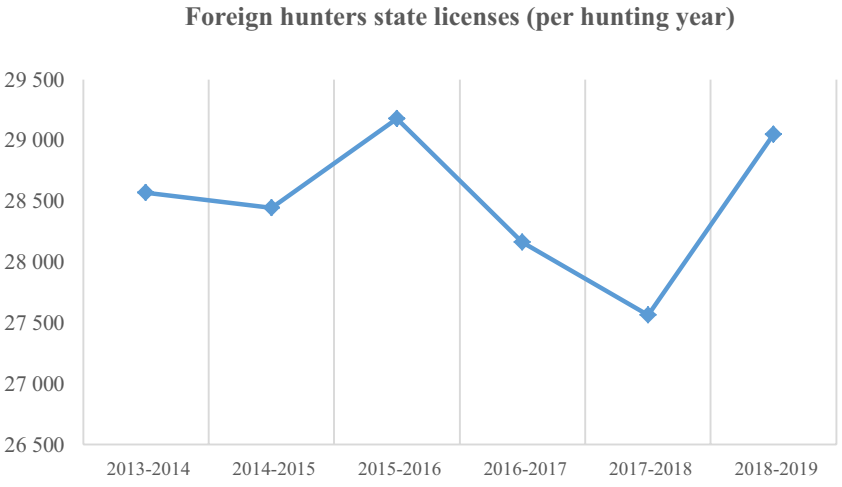

Figure 2. Number of Swedish hunting licenses sold to foreign hunters between 2013 and 2019.

(Hansen et al. 2012). In response to demographic change, many countries have developed tailored programs for hunter recruitment and mentorship (Andersen et al. 2010, Gude et al. 2012, Hansen et al. 2012, Pellikka and Forsman 2013, Zhang and Miller 2019). Other findings highlight the need for state agencies and organizations to provide sufficient funding to encourage recruitment, such as lower license prices (Schorr et al. 2014) and retaining active hunters (Mehmood et al. 2003, Ryan and Shaw 2011).

Demographic changes are linked to the degree of urbanization, which is why area of residence matters. Urbanization imply that people have less direct contact with nature, which can affect attitudes to wildlife and hunting (Heberlein and Ericsson 2005), thus connecting the structural level to an individual level. The issue here is that socialization mechanisms are not functioning as they once did because potential hunters live to a large extent in urban areas far from the physical natural resources and hunting culture typical of rural communities (Stedman 1993, Littlefield and Ozanne 2009). Furthermore, social network is an important determinant of whether a person hunt or not. People living or growing up in rural areas, who have at least one parent who hunts, hunt more often than others (Heberlein et al. 2002). Men hunt more frequently and regularly than women (Heberlein et al. 2008, Pellikka and Forsman 2013). Previous research also suggests that more women, compared to men, hunt with a partner (Larson et al. 2014, Eriksson et al. 2018). Thus, one of the key barriers to new hunters' actual participation is the lack of an appropriate social network (Andersen et al. 2010, Lindberg 2010, Pellikka and Forsman 2013, Eriksson et al. 2018).

Institutional factors

Institutions represent the rules and regulations that individuals and groups have agreed upon for cooperation, or coexistence, within societies. Institutions can be formal, in terms of rules and laws, as well as informal, such as social norms, steering individuals towards a certain behavior (North 1990). If formal and informal rules correspond to a high degree, individuals tend to comply. For this reason, formal rule changes, such as new hunting legislation, or changes in informal systems, such as in hunting culture, can affect hunter participation. A number of Swedish studies have shown that changes to the Swedish hunting law and policy on wildlife management may have affected hunter behavior, as a result of increased costs, increased bureaucratization and higher demands on performance of wildlife management (Wennberg DiGasper 2008, Sandström et al. 2013, Bjärstig et al. 2014, Lindqvist et al. 2014). We suggest that at least three institutions affect hunter recruitment in Sweden: those that provide access to hunting land, access to hunting firearms and a knowledge-based hunting practice. Access to hunting land is regulated by the law of property rights (SFS 1987:259), which means that hunting rights belong to the landowners, implying that a hunter either needs to own land or have the opportunity to lease the hunting rights. This is probably limiting how many people can hunt in Sweden, as the resource is presumed to be constant over time (Eriksson et al. 2018). To access firearms in Sweden the usual requirement for obtaining a weapon license is that an individual practice either hunting or target shooting – and have passed the hunting proficiency tests (SFS 1987:905, SFS 1996:67). Access to firearms may limited by economic reasons, as it can be expensive to purchase firearms (Andersen et al. 2010, Pellikka and Forsman 2013). Lastly, knowledge-based hunting practice refers to the institutional change that took place in Sweden in 1985, when the knowledge based hunting proficiency test replaced the previously needs based license (Protocol 1983/84: 56–58, 161). A norm turning the focus toward the need to increase the knowledge among the hunters.

Individual factors

Individual factors that may constrain behaviors can be intrapersonal (psychological states and attributes) or interpersonal (the interaction between different individual's characteristics and preferences) (Crawford et al. 1991). Some individual factors frequently discussed in the HRR literature are psychological factors such as values, attitudes, norms and behavioral intentions held by an individual (Heberlein et al. 2002), and instrumental factors such as money and time (Pellikka and Forsman 2013, Larson et al. 2014). By psychological factors we refer to how individuals consider themselves and their environment with respect to values, attitudes and behavioral intentions (Heberlein 2012). Values are transferred between people in processes of socialization, and they can shift due to modernization and societal changes (Manfredo et al. 2015). Often, practical considerations or norms/social expectations circumscribe which attitudes and behavioral intentions are translated into practice, meaning that not all behavioral intentions actually lead to a behavior, depending on what social norms are at play (Heberlein 2012). Therefore, we assume that psychological factors such as attitudes, emotions and social norms affect hunting participation.

We also assume that instrumental factors such as access to time and money are crucial in determining whether a person hunt or not. Hunting opportunities in Sweden are limited by a lack of leisure time and money (Lindberg 2010, Eriksson et al. 2018). Historically, more leisure time and higher incomes have resulted in more hunting opportunities (Mattsson et al. 2007).

Based on previous research, three groups of factors: structural, institutional and individual, are guiding the analysis (Table 1). This frame enables us to formulate three research questions: 1) what are the motives for taking the hunting proficiency test? 2) Which factors affect intentions to hunt/not hunt? 3) Are there common factors across the groups?

Methods

We address potential new hunters, defined as those taking the hunter proficiency test (reactivation of former hunters could be a potential target group to find answers for why the number of state-owned hunting licenses are decreasing, but they have not been addressed in this study as the paradox concerns the hunter proficiency test), from all over Sweden. To reach this group we involved the two largest hunter organizations in Sweden (the Swedish Association for Hunting and Wildlife Management and the National Association of

Table 1. Analytical framework.

Factors		Theoretical definition	Operationalization
Structural	Demography	Age, sex	The typical newly recruited hunter is male and +30 years old
	Urbanization	Area of residence	Urban/rural divide (an urban resident is defined as an individual living in a city with > 10 000 inhabitants)
			North/south divide
	Social networks	Access to hunters	Relationships with other individuals that hunt
Institutional	Institutions	Rules and norms	Proficiency test (importance of knowledge)
			Landowning/access to hunting land
			Access to weapons
Individual	Psychological factors	Social norms and attitudes	The individual shares existing norms, e.g. views on the environment, hunting-related activities and management
	Instrumental factors	Time	Leisure time
		Money	Costs of damage to forest and crops, income
		Knowledge	Individual capital

Hunters), who provide the examiners for the hunter proficiency tests. The theoretical test is usually performed before the practical exam, and in larger groups than the practical exam, so in order to reach as many as possible we aimed for contact during the theoretical tests. During the course period between March and May in 2017, the examiners administered a brief questionnaire (Eriksson et al. 2018). As part of the questionnaire, the course participants were asked to do an interview about hunting and wildlife management, if willing they signed a consent form. Of the 869 respondents, 128 consented to be interviewed. From these 128 interested participants, we used purposeful sampling (Marshall 1996) to derive 40 participants for the semi-structured interviews (Ritchie et al. 2014, see Supplementary material Appendix 1 for interview guide).

We used four criteria to select interviewees and capture variation in sex, age, county of residence and access to hunting land (Table 2). As the interviewees voluntarily decided to participate in the interviews the sample is not representative of the whole population of people taking the hunter proficiency test. A qualitative research approach seeks to go in-depth in a small amount of cases (Marshall 1996), so from our novel results Sweden can begin to understand how potential new hunters think about the hunter proficiency test and hunting participation, e.g. what motives that drives them and so forth. This is valuable for further studies on this topic. The results presented here are based on the interview material from the 40 interviewees. The interviews were conducted via telephone and lasted 20–45 min.

We performed a thematic analysis on the material (Ritchie et al. 2014). Factors from Table 1 guided the analysis, but without excluding any other themes that appeared in the data. Coding was conducted using computer software NVivo Plus ver. 12, by using key words and sentences, matching them with the thematic framework. For the presentation in the result chapter we made a prioritization of the themes/factors based on the number of interviewees stating the same theme/factor. First-order themes were those that >20 people mentioned, second order themes were mentioned by >10 people, and so on. Quotes are translated by first author.

Table 2. Descriptive characteristics of the interviewees.

Sex	Access to hunting land	Year of birth	Rural area of residence (other)	Intention to hunt
Female = 12	9 of 12	1955–1985	6 (1 unknown, 5 urban)	9 of 12
Male = 28	15 of 28	1950–2000	12 (1 unknown, 15 urban)	18 of 28

This research project was conducted following Swedish and European research practice (ALLEA 2017, Swedish Research Council 2017), including principles of honesty, respect and accountability. Ethical review and approval was not required for this case study in accordance with local legislation and institutional requirements.

Results

Motives to take the hunting proficiency test

We found five motives to be prominent for the willingness to take the hunting proficiency test: interest in nature, social relationships, knowledge, access to game meat and responsibility for land. First, interest in nature is defined in three ways by the interviewees: 1) using nature for its various facilities, such as providing a means of recreation, relaxation and possibly meditation. 2) Being interested in nature because of previous experience of outdoor activities such as fishing, or berry or mushroom picking. 3) Learning, i.e. wanting to learn more about topics currently unfamiliar to the respondent, such as how ecosystems function and knowledge of various animals and birds.

Secondly, the interviews revealed a connection between taking the hunting proficiency test and social relationships that could also be defined further in three ways: the interviewee knew someone who was a hunter and had been influenced by that person(s) to hunt, either 1) alone or 2) with the known hunter. Alternatively, 3) the interviewee viewed hunting as a highly social activity that incorporated meeting new people and doing things collectively. More than half of the interviewees had never participated in hunting, or only participated once such as joining a drive, or similar activity, without actively shooting an animal. Therefore, the interviewees cannot be said to have a strong social connection with hunting, rather the idea of hunting as a social activity seemed attractive to many of them.

Thirdly, the theme of gaining in-depth knowledge of the skills associated with hunting contained three different aspects: 1) dogs (training hunting dogs), 2) target shooting

(for fun/leisure activity) and 3) food and nutrition (butchering, how to handle meat and what to cook). Fourthly, gaining access to game meat was another reason for taking the hunting proficiency test. As defined by the interviewees, game meat is desirable because it is organic, locally produced, ethically produced and has a good flavor.

The final reason for taking the test was exclusive to those interviewees who were landowners. These interviewees described how being a landowner meant managing not only forest and crops but also the wildlife populations on their land. They needed the hunting proficiency test to manage wildlife such as wild boar and geese. From a production perspective, this theme is connected with economic factors, i.e. decreasing damage to crops and forest. However, few of the interviewees provided economic arguments; rather, they highlighted a sense of responsibility.

Motives not to hunt

The motives for hunting differed slightly compared with the motives for taking the hunting proficiency test. Urban residents expressed less intention of hunting than rural residents did. The primary structural reason appeared to be urbanization: living in an urban environment with lack of access to hunting land or socialization mechanisms. However, we found that although rural hunters owned or had access to land to a greater extent, this did not mean that lack of access to hunting land was a prominent theme among the urban group. In fact, the majority of interviewees stated that they had access to hunting opportunities if they wanted to primarily through their social networks. Urban residence was noteworthy because the urbanized potential new hunters were not taking the hunting proficiency test to hunt, but were driven by other motives. Of the interviewees that had no intention of hunting (regardless of sex), we found that there were individual factors at play. A desire for knowledge was the single most important reason why these interviewees had chosen to take the hunting proficiency test, as exemplified by the following quote.

> "I am quite interested in many different things really, but I have a fairly large environmental commitment in general. Trying to live more sustainably, but also in that, I think maybe I need a greater understanding of how things interconnect in nature, different biotopes, what affects what. I have certainly received some [knowledge] through my years at school but I have never received it from a hunter's perspective and I am quite curious about the culture around it and getting to know how hunters position themselves in relation to the environment and environmental care and such things. I find it exciting to gain insight."

Also, a not so prominent motive was how to feel about killing an animal, which can be considered a psychological factor. Those hesitant of the idea of shooting an animal had a great interest in animals and nature, so rather this motive seemed to be connected to an ethical consideration to not take an animal's life. We also had responses where the person was not interested in the act of hunting, but wanted to gain the knowledge provided by the hunting courses. They wanted to learn something new or expand their knowledge in an area they were already interested in. Finally, interviewees also had other interests, such as training dogs or target shooting. Having passed the hunter proficiency tests is the most straightforward way to firearm access for hunting, as other forms of firearms usage and ownership are much more strictly regulated.

Motives to hunt

Structural factors: demography, urbanization and social networks

Area of residence was important for individuals intending to hunt for the first time. It was not described as a motive in itself, other than in a few cases where physical closeness to the land was expressed as being important like living on or close to hunting land. The rural interviewees expressed an intention to hunt, in contrast to the urban group. Furthermore, the responses indicated that a social network, i.e. a personal relationship with someone who hunted, was the single most important factor influencing how and why people intended to hunt. Either this person had influenced them to hunt or was the person that the interviewees would hunt with. The hunter could be a family member, relative, friend, colleague or neighbor.

Institutional factors: rules and norms

Institutional studies imply that formal and informal rule changes, such as new hunting legislation or a change in hunting culture, affect hunting participation (Bjärstig et al. 2014, Lindqvist et al. 2014). Closely connected with a social network, is access to land. In a theoretical sense, access to land is governed by the institution of property rights. However, not all of the interviewees were landowners, which is why social networks fed into the institutional factor of access to land. Access to land is an important factor, directly affecting their intention to hunt. As stated by a landowner:

> "My mother owns land […] and we have our cabin there, and we have always been up there a lot, in the forest, planting trees, participating in hunting, picking berries and all kinds of things. So I see it [hunting] as a natural part of owning land and partly I think that the day me and my siblings will inherit that forest, it is good to know things. I am interested in learning everything possible".

Another relevant institution revealed by the responses was that of knowledge; a desire for knowledge about something new, mostly the physical experience of hunting. In the quote below, the respondent talks about his thoughts on participating in hunting for the first time. It is a mix of a desire to pass the tests and to learn more about how hunting is actually practiced in real life.

> "Primarily I do not look forward to shooting an animal, but I look forward to first passing the test so that I can come out [in nature] and then see how everything works when it comes to the organization in a hunting team and how it is practically to be in the forest and maybe go on a drive."

Course participants probably learned during the proficiency course that it is important to have a broad

knowledge of hunting. The importance of knowledge can be traced back to the institutional change that took place regarding the hunting proficiency test in 1985, when hunters' knowledge became central to hunting.

The interviewees with a behavioral intent to hunt often knew someone who hunted, for example family members, relatives or friends. Hunting was considered a family activity that symbolized links with family associations, hunting teams and neighbors – a social norm. One theme that was revealed was that of community and tradition, where many expressed a desire to maintain community structures and old traditions:

> "The community. We are a fairly scattered group in our hunting team, those who are very old and very young. That community, across generations, is very nice. It is a big part of living in the countryside, which I do. And a part of the neighborhood community. Even if we do not harvest anything, it does not matter, it is more about being out in nature, looking for animals and tracks, and then being happy when you find them even if you do not shoot. To talk about it afterwards is such a big part of the neighborhood community. You would not want to be without it."

Individual factors: psychological and instrumental factors

Individual factors such as attitudes and resources were prominent. For example, access to meat was often mentioned as a motive for hunting. It was described as a product that they wanted to consume in preference to any other kind of meat, for ethical and environmental reasons – and to be self-sufficient. The aspects of wild game meat that were mentioned were flavor (it tastes good), ethics (the animals are killed in a respectful manner) and being environmentally friendly.

> "It may sound strange to kill an animal when you like them, but I have the attitude that I want to eat meat that I know where it comes from. Instead of going to the grocery store like everyone else and buying meat. I think it's a little more ethical and better for the environment as well, and I've always liked that."

A second recurring theme was stewardship. Originally this was not a part of the analytical framework; however, a combination of various psychological factors formed this theme. It was only relevant to those who were landowners, directly or indirectly. Access to land seemed to determine their intention to hunt. Access to land was also connected with three other separate but intertwined factors: ecological motives, economic motives and self-sufficiency. In general, the narrative was that owning land means that you have a responsibility for the animals living on your land, and harvest becomes part of maintaining a balance between the animals and the land (either forest or agricultural crops), identified as sustainability. The interviewees preferred to harvest wildlife populations that caused damage and they had a strong determination to a balance wildlife populations and access to food on their local hunting land. They thus identified hunting as the tool to achieve sustainability within the ecosystem. They did not want wildlife populations to grow too big, and they did not want their land that was used for agriculture and forestry to be damaged. Species that were explicitly mentioned were roe deer, wild boar, fox and badger. There might be reinforcing effects between the institution to own land and the responsibilities that come with that, and the individual perceptions of being a responsible landowner, but it was impossible to separate out those relationships within this study. Interviewees living in areas defined as a rural saw hunting and wildlife management as being strongly connected with the ownership of hunting land, and, in most cases, they lived on or close to their hunting land. It was a part of the lifestyle to partake in hunting, and to reduce the size of the wildlife populations on their own hunting land, which we understood as an ecological motive.

> "It feels like it is a responsibility to be involved in taking care of the forest. And that it is a privilege, of course. As naturally as I am related to half of the people in this village and that we have a family association, it feels like hunting is a part of that [...] it feels like it is a part of the whole package of coming from this place".

By economic motives, we refer to the economic costs to landowners of damage to forest and agriculture, which in a few cases were described as a motive to hunt:

> "We are doing it [hunting] here, we have agriculture as well and it is about to derail completely with all the wildlife. I do not really know what to do about the situation, but we need to decrease the wildlife population for sure. When I was younger we could grow all sorts of crops here, but now it is hardly possible to grow anything compared with before."

All these aspects, together constituting stewardship, are expressions of psychological factors. It is a view of the environment and hunting practices that is very close to utilitarianism, that there is an interplay between nature and humans, and that humans can and should use natural resources like wild game meat. An associated recurring theme was ecosystem services, which to some extent relates to a utilitarian view of the environment and animals. Interviewees with an intention to hunt stated that they had a larger relationship with nature that extended beyond just hunting, and it was an integral part of their motivation to hunt. Examples of other activities that these interviewees took part in were fishing, picking berries, hiking, walking and experiencing the outdoors. Using nature in these different ways makes hunting just another way of using nature for psychological restoration, as often the motives for being out in nature related to well-being: feeling calm, meditating, feeling happiness, excitement, relaxation, being away from people.

Finally, only a few of the interviewees explained that individual resources like time and money affected their hunting participation. All of them intended to hunt but they expressed negative barriers, such as not having enough time or money to participate, as exemplified by the following quote.

> "Access to hunting land requires a lot of money, it's expensive. I realize that now. It is a lot of money, both for the basic equipment, weapons, ammunition, clothing and a place to hunt, licenses, membership in the hunter association, for example. You want to read and be involved, so you need magazines and such, then it is a lot of money."

Concluding discussion

Our aim was to explore what factors that both enabled and hindered new potential hunters' participation in hunting. The results show that important drivers to taking the hunting proficiency test are an interest in animals and nature, as well as having social relationships with hunters. However, taking the hunting proficiency test is not a guarantee of actual participation in hunting. The motives to hunt/not to hunt can be defined roughly as two types of new hunters.

The first type can be defined as people living in an urban area with variable intentions concerning hunting participation. A large majority of the interviewees did not intend to hunt, especially those living in urban areas. We may partly explained this by the voluntary bias in our sample: many of our interviewees were female and/or urban. However, the finding still highlights some central challenges to hunter recruitment. Barriers similar to those identified in other countries are also present in Sweden, such as accessing hunting opportunities (Larson et al. 2014). Factors such as expanding the individual's knowledge base and connections with other forest-related activities drive up the number of people taking the hunting proficiency test.

The second type can be defined as the environmental steward, people who live and hunt in a rural setting and primarily hunt to manage wildlife. Within the rural group, a clear majority intended to hunt, largely driven by environmental stewardship and/or ecosystem services, connecting with both the institution of landowning as well as a utilitarian view on the environment, and demonstrating the importance of including institutional aspects in the analysis. This is much in line with the current hunter discourse, that hunters are managing nature as stewards of the environment (Lindqvist et al. 2014). Again, it is difficult to assess to what extent this is an effect of participating in the hunters' proficiency courses, or whether an individual has developed these ideas and views on his or her own. For many of the interviewees these were lifestyle choices. Managing land, being out in the forest, participating in hunting, using nature and its resources, were part of their lifestyle, usually described as 'natural', 'the meaning/the origin' or 'important'.

It is important to acknowledge the limitations of the studied sample. It is not possible to generalize our results to a broader population, e.g. demographic factors like sex or age did not seem to matter. However, the results are interesting to build future research on. For instance, one possibility could be to scale up the study by using sampling techniques that allow for generalizability of a whole population (Dillman et al. 2014). Another suggestion is to connect the findings from this thematic analysis to larger quantitative data of the hunter population and to general sociodemographic data on the Swedish population, to get a frame of reference.

An important implication of this study is that the Swedish Environmental Protection Agency plays a key role in the partnership model, because it has the capacity to affect the institutional setting. The current partnership model for wildlife management attaches great importance to the rural group which often are land owners living close to their hunting ground: they must, compared to the urban group, bear economic, ecological and social responsibilities for the partnerships' continued existence, which can be perceived as unfair (Bjärstig et al. 2014). By initiating a discussion about the problems and solutions among the partners, and by ensuring that structural and institutional barriers (e.g. access to land and social networks) identified in this study are minimized the state can support recruitment. Furthermore, these are new hunters that have not experienced this unfairness personally, however, considering other research that identifies how governmental institutions may burden relevant actor groups (Eliason 2012, von Essen and Allen 2017), there is a risk of this group quitting hunting if not supported properly. The hunter organizations themselves cannot recruit hunters to a necessary extent, thus the state could take a larger responsibility given the political will and intention to have hunters as the basis in the partnership model. Clearly there is strong support for hunting among the public in Sweden (Kagervall et al. 2012), as well as a large interest in taking the hunting proficiency test and participating in hunting, all of which are reasons to review how barriers can be lowered.

Specific factors affecting the urban interviewees included landownership/leases – you need land to hunt on to practice the behavior of hunting. There are already small-scale recruitment initiatives in place to connect landless hunters with landowners (Swedish Association for Hunting and Wildlife Management 2018) but without wider coordination or on larger scales. Considering that traditional rural socialization mechanisms are not working as before, the partnership actors could find ways to connect potential hunters already when they start the hunting proficiency course with landowners in a more effective way, e.g. by networking and information campaigns. Some potential problems are individual landowners' perceptions, where other studies have shown that landowners rarely want to lease hunting rights to 'unknown' people (Burke et al. 2019). A structural problem is networking in the diversity and fragmentation of the landowner group in Sweden (Ezebilo et al. 2012). By mapping landowners in a given geographical area, one solution is to implement an outreach program to match landowners with hunters. Mentorships or cross-generational approaches to hunter recruitment (Ryan and Shaw 2011, Larson et al. 2014) could be implemented advantageously within Sweden's local hunting teams. Recruiting foreign hunters is also a marketization solution, e.g. by information, subsidies or discounts. Socio-cultural and management-oriented values might be lost in the process, but it could serve as a strategy to even out imbalances between the surplus of wildlife and decreasing numbers of hunters.

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References

ALLEA 2017. The European code of conduct for research integrity. – <https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf>, retrieved 1 October 2019.

Andersen, O. et al. 2010. Hunting desertion in Norway: barriers and attitudes toward retention measures. – Hum. Dimens. Wildl. 15: 450–466.

Andersen, O. et al. 2014. Applying typology analyses to management issues: deer harvest and declining hunter numbers. – J. Wildl. Manage. 78: 1282–1292.
Arnett, E. B. and Southwick, R. 2015. Economic and social benefits of hunting in North America. – Int. J. Environ. Stud. 72: 734–745.
Bjärstig, T. et al. 2014. Partnerships implementing ecosystem-based moose management in Sweden. – Int. J. Biodivers. Sci. Ecosyst. Serv. Manage. 10: 228–239.
Brainerd, S. M. and Kaltenborn, B. 2010. The Scandinavian model: a different path to wildlife management. – Wildl. Profess. 4: 52–56.
Burke, C. R. et al. 2019. Predicting private landowner hunting access decisions and hunter density. – Hum. Dimens. Wildl. 24: 99–115.
Crawford, D. W. et al. 1991. A hierarchical model of leisure constraints. – Leisure Sci. 13: 309–320.
Decker, D. J. et al. 1984. Antecedents to hunting participation, an exploratory study of the social–psychological determinants of initiation, continuation and desertion in hunting. – Cornell Univ., Ithaca, New York.
Decker, D. J. et al. (eds) 2012. Human dimensions of wildlife management, 2nd edn. – Johns Hopkins Univ. Press.
Dillman, D. A. et al. 2014. Internet, phone, mail and mixed-mode surveys: the tailored design method. – Wiley.
Eliason, S. 2012. Crowding, public image and bureaucracy: issues in the montana outfitting industry. – J. Rural Commun. Devel. 7: 57–71.
Eriksson, M. et al. 2018. Viltvårdsavgiften – en studie om svenskarnas vilja att betala det statliga jaktkortet. – Report 6853, Swedish Environmental Protection Agency, Stockholm.
Ezebilo, E. E. et al. 2012. Browsing damage by moose in Swedish forests: assessments by hunters and foresters. – Scand. J. For. Res. 27: 659–668.
Gude, J. A. et al. 2012. Deer and elk hunter recruitment, retention and participation trends in Montana. – J. Wildl. Manage. 76: 471–479.
Hansen, H. P. et al. 2012. Demographic transition among hunters: a temporal analysis of hunter recruitment dedication and motives in Denmark. – Wildl. Res. 39: 446–451.
Heberlein, T. A. 2012. Navigating environmental attitudes. – Oxford Univ. Press.
Heberlein, T. A. and Ericsson, G. 2005. Ties to the countryside: accounting for urbanites attitudes toward hunting, wolves and wildlife. – Hum. Dimens. Wildl. 10: 213–227.
Heberlein, T. A. et al. 2002. Correlates of hunting participation in Europe and North America. – Z. Jagdwissen. 48: 320–326.
Heberlein, T. A. et al. 2008. Female hunting participation in North America and Europe. – Hum. Dimens. Wildl. 13: 443–458.
Helle, P. et al. 2016. Wildlife monitoring in Finland: online information for game administration, hunters and the wider public. – Can. J. For. Res. 46: 1491–1496.
Kagervall, A. et al. 2012. Om svenskars inställning till jakt och vargjakt. – Report no. 2012:8, Swedish Univ. of Agricultural Sciences.
Larson, L. R. et al. 2013. Hunter recruitment and retention: a framework for research and action. – Cornell Univ., Ithaca, New York.
Larson, L. R. et al. 2014. Exploring the social habitat for hunting: toward a comprehensive framework for understanding hunter recruitment and retention. – Hum. Dimens. Wildl. 19: 105–122.
Lindberg, E. 2010. Hunter demography, trends and correlates of hunting participation in Sweden. – MSc thesis, Swedish Univ. of Agricultural Sciences, Dept of Fish, Wildlife and Environment, Umeå, Sweden.
Lindqvist, S. et al. 2014. The changing role of hunting in Sweden: from subsistence to ecosystem stewardship? – Alces 50: 35–51.
Littlefield, J. and Ozanne, J. L. 2009. Consumer socialization: the role of hunting and gun rituals in becoming a man. – ACR North American Advances.
Ljung, P. E. et al. 2015. Game meat consumption feeds urban support of traditional use of natural resources. – Soc. Nat. Resour. 28: 657–669.
Manfredo, M. et al. 2015. Implications of human value shift and persistence for biodiversity conservation. – Conserv. Biol. 30: 287–296.
Marshall, M. N. 1996. Sampling for qualitative research. – Family Pract. 13: 522–525.
Mattsson, L. et al. 2007. Jakten i Sverige – Ekonomiska värden och attityder jaktåret 2005/2006. Report no. 1, published at <www.viltochfisk.se>, 29 November 2007.
Mehmood, S. et al. 2003. Factors associated with declining hunting license sales in Alabama. – Hum. Dimens. Wildl. 8: 243–262.
Mensah, J. T. and Elofsson, K. 2017. An empirical analysis of hunting lease pricing and value of game in Sweden. – Land Econ. 93: 292–308.
Messmer, T. A. 2000. The emergence of human–wildlife conflict management: turning challenges into opportunities. – Int. Biodeterior. Biodegrad. 45: 97–102.
North, D. C. 1990. Institutions, institutional change and economic performance. – Cambridge Univ. Press.
Pellikka, J. and Forsman, L. 2013. The number of the hunting females is increasing in Finland. – Suomen Riista 59: 34–51.
Price Tack, J. L. et al. 2018. Managing the vanishing North American hunter: a novel framework to address declines in hunters and hunter-generated conservation funds. – Hum. Dimens. Wildl. 23: 515–532.
Protocol 1983/4:58. Thursday 12 January 1984, Swedish Parliament.
Ritchie, J. et al. (eds) 2014. Qualitative research practice: a guide for social science students and researchers. – Sage, London.
Ryan, E.L and Shaw, B. 2011. Improving hunter recruitment and retention. – Hum. Dimens. Wildl. 16: 311–317.
Sandström, C. et al. 2013. Conflict resolution through ecosystem-based management: the case of Swedish moose management. – Int. J. Commons 7: 549–570.
Schorr, R. A. et al. 2014. The Montana deer and elk hunting population: the importance of cohort group, license price and population demographics on hunter retention, recruitment and population change. – J. Wildl. Manage. 78: 944–952.
SFS 1987:259. Hunting law. – Ministry of Enterprise and Innovation, Stockholm.
SFS 1987:905. Hunting ordinance. – Ministry of Enterprise and Innovation, Stockholm.
SFS 1996:65. Arms law. – Ministry of Justice, Stockholm.
Stedman, R. C. 1993. Expanding the concepts of hunters and hunting: a social world analysis. – MSc thesis, Cornell Univ., Ithaca, NY.
Swedish Association for Hunting and Wildlife Management 2018. Integration. – <https://jagareforbundet.se/utbildning/integration/>, retrieved 6 April 2020.
Swedish Environmental Protection Agency 2019a. Jaktkort och jägarexamen. – <www.naturvardsverket.se/Var-natur/Jakt/Om-jaktkort-och-jagarexamen/>, retrieved 5 April 2020.
Swedish Environmental Protection Agency 2019b. Antal statliga jaktkort uppåt. – <www.naturvardsverket.se/Nyheter-och-pressmeddelanden/Nyhetsbrev/Viltnytt/artiklar-2019/Nr-3-2019/Antal-statliga-jaktkort-uppat-/>, retrieved 20 October 2019.
Swedish Research Council 2017. Good research practice. – <www.vr.se/download/18.5639980c162791bbfe697882/1555334908942/Good-Research-Practice_VR_2017.pdf>, retrieved 1 October 2019.

von Essen, E. and Allen, M. P. 2017. Taking Prejudice seriously: burkean reflections on the rural past and present. – Sociol. Ruralis 50: 139–147.
U.S. Fish and Wildlife Service 2016. National survey of fishing, hunting and wildlife-associated recreation. – <www.census.gov/content/dam/Census/library/publications/2018/demo/fhw16-nat.pdf>, retrieved 26 April 2017.
Wennberg DiGasper, S. 2008. Natural resource management in an institutional disorder: the development of adaptive co-management systems of moose in Sweden. – PhD thesis, Luleå Univ. of Technology.
Zhang, X. and Miller, C. A. 2019. Associations between socioeconomic status and hunting license sales among census tracts in Cook County, Illinois. – Hum. Dimens. Wildl. 24: 148–158.

Supplementary material (available online as Appendix wlb-00721 at <www.wildlifebiology.org/appendix/wlb-00721>). Appendix 1.