



Are birdwatchers willing to participate in local goose management? A case study from Sweden

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Abstract

Stakeholder involvement in wildlife management is important and requires knowledge about factors motivating such participation. With several goose populations increasing in Europe and goose management incorporating multiple objectives, involvement of stakeholder groups with diverse interests is needed. In this study, we examined how evaluations of geese (attitude and acceptance capacity), but also experiences of birdwatching and birdwatcher identity, were associated with willingness to participate in local goose management. A survey among members of Sweden's largest birdwatching organization was conducted ($n = 5010$). The majority of respondents, 64%, displayed a divided evaluation of geese, most frequently in terms of an overall positive attitude towards geese but a low acceptance for current goose population levels (i.e. acceptance capacity). Birdwatchers' willingness to participate in goose management was generally low. Whereas they were more willing to take part in goose counts (i.e. monitoring) than to participate in local goose management groups, they were least willing to contribute to mitigating crop damage through scaring geese. Results further revealed that birdwatchers with a divided evaluation of geese and an entirely positive evaluation displayed the highest willingness to participate in goose management. However, a stronger distinct birdwatcher identity as a result of more birdwatching experiences was even more strongly associated with higher willingness to take part in goose management. The results highlight a need to intensify efforts to engage stakeholder groups with an interest in conservation issues in the participatory goose management system in Europe.

Keywords Birdwatchers · Attitudes · Acceptance capacity · Identity · Geese · Goose management

Introduction

Several wild goose populations in Europe have historically been overexploited and were once threatened by extinction. Since the 1930s, however, populations of for example the

greylag goose (*Anser anser*) and barnacle goose (*Branta leucopsis*) have recovered to the extent that they can now be termed as 'superabundant' (Fox and Madsen 2017; Stroud et al. 2017). Provision of refuges and increased hunting restrictions have, together with favourable changes in agricultural practices, contributed to the recovery of goose populations. Whereas geese provide ecosystem services such as nutrient cycling and stimulation of plant productivity, recreational hunting, meat, and aesthetic experiences (Green and Elmberg 2014), the superabundance of some populations has led to agricultural damage, compromised air traffic safety, impact on ecosystems, fouling on beaches and in parks, and conceivably disease transmission (Samelius and Alisauskas 2009; Buij et al. 2017; Fox et al. 2017; Bakker et al. 2018). Increases in the latter, so called 'eco-system disservices', have led to heated debates about conservation of birds and hunting practices (Buij et al. 2017; Madsen et al. 2017).

Given that several goose species are migratory and move within a geographic flyway on an annual basis, there is a need to balance different interests and to coordinate

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management among countries. Therefore, a multi-level system for an adaptive flyway management of goose populations in Europe is emerging. In 2015, the European Goose Management Platform was established under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) acknowledging different interests such as conservation objectives, public health, air safety, and crop damage (AEWA 2016a, b; Stroud et al. 2017; Jensen et al. 2018; Powolny et al. 2018). In this participatory approach, involvement from diverse actors and stakeholder groups is needed at different levels of the system to share knowledge, learn, and reach agreements (Williams and Madsen 2013). Thus, there is a growing interest to understand stakeholders involved in participatory management (e.g. Tombre et al. 2013; Tuvendal and ElMBERG 2015) as well as the perspectives of the broader stakeholder groups (e.g. individual farmers) to learn about and improve linkages between the system and individuals (e.g. Eriksson et al. 2021a). However, stakeholder groups with a conservation focus, such as birdwatchers, have until now been given little attention in the goose management context. Even though birdwatchers' conservation efforts have been examined more generally (Hvenegaard 2002; Cooper et al. 2015; Cheung et al. 2017; Shipley et al. 2019), there is a gap in the understanding of their interest in becoming involved in management of birds where conservation is one of several objectives. In this study, we examined birdwatchers' willingness to participate in goose management in Sweden, a context where problems associated with superabundant goose species are increasing and a participatory approach to manage geese is emerging.

Birdwatchers

Ornithology is the study of birds, which is an academic discipline as well as a pastime activity carried out by laypersons. The term 'birdwatching' is more recent and is used for a wide spectrum of human activities focussing on birds, but with a leisure and pastime connotation. Accordingly, birdwatching encompasses detecting, watching, and listening for birds in their natural habitat (Kellert 1985; Cooper and Smith 2010; Vas 2017). It also includes activities such as photographing birds, creating lists of observed species, traveling to see birds, and creating bird friendly habitat around the residence by adding, e.g. feeders and baths. Explicit motives for birdwatching include studying birds, enjoying the sight and sound of birds and nature, seeing a new or rare species, enjoying the outdoors, and contributing to conservation (Scott et al. 2005; Sali et al. 2008; Chen and Chen 2015; Randler 2021). Nevertheless, birdwatchers are a heterogeneous group, engaged in different forms of birdwatching and with different motives for it (Hvenegaard 2002; Vas 2017; Kruger and Viljoen 2020). Birdwatchers are often differentiated based on recreation specialization, depicting

a progression in birdwatching engagement reflected in three related domains: behaviour, skill and knowledge, and commitment (Lee et al. 2015; De Salvo et al. 2020; see also Scott and Shafer 2001; Lee and Scott 2004; Scott et al. 2005; Vas 2017). Recreation specialization is believed to develop through long-term participation, and it is associated with changes in preferences and group affiliations (McFarlane 1996). For example, Scott et al. (2005) confirmed that individual motives specific for birdwatching, such as seeing new species and seeing as many species as possible, were more important to birdwatchers with higher levels of specialization. Yet, studies have also suggested that the three specialization domains may not form a coherent indicator but reflect different dimensions (Lee and Scott 2004; De Salvo et al. 2020).

Studies predominately from the United States and Asian countries (e.g. Thailand and Taiwan) have revealed that birdwatching and the level of recreation specialization are associated with structural factors, including gender, age, education, and income. Whereas earlier studies suggest that women are overrepresented among birdwatchers (Scott and Thigpen 2003; Carver 2009), several recent studies have found that more men than women are birdwatchers (Chen and Chen 2015; Lee et al. 2015; Cheung et al. 2017; Vas 2017). Moreover, a higher level of recreation specialization has been confirmed among male compared to female birdwatchers (Hvenegaard 2002), but gender differences may rather reflect diverse birdwatching styles with women being more likely to engage in birdwatching as a recreational hobby and men more involved in the competitive type of birding (Cooper and Smith 2010; Lee et al. 2015). The age span among birdwatchers varies; in many countries, there is an overrepresentation of older age groups (Chen and Chen 2015; Cooper et al. 2015; Lee et al. 2015; Vas 2017). Hvenegaard (2002) found that the level of recreation specialization was positively associated with age, but a progression trajectory where specialization increases with age is only one potential developmental path for birdwatchers over time; specialization level may also simply be maintained or even decline (Oh et al. 2011; Backlund and Kuentzel 2013). Birdwatchers have furthermore been found to have high educational and income levels (Hvenegaard 2002; Scott and Thigpen 2003; Carver 2009; Chen and Chen 2015; Lee et al. 2015; Cheung et al. 2017; Vas 2017). However, while Hvenegaard (2002) found that the level of recreation specialization was positively associated with higher income, it was unrelated to education.

Birdwatchers and conservation

Values and value orientations are often considered important for understanding varying levels of support for conservation (Teel et al. 2010; Manfredo et al. 2020). Conservationist groups generally endorse a mutualism value orientation,

reflecting compassion for wildlife and considering wildlife to deserve rights similar to those of humans (Bruskotter et al. 2019; Ehrhart et al. 2021). A stronger mutualism value orientation has in turn been found to be associated with stronger support for wildlife conservation measures (Teel et al. 2010; Hermann et al. 2013). With birdwatchers' desire to experience birds (e.g. watching and listening rather than utilizing them for food), their interests converge with conservationists. In line with this reasoning, studies have confirmed birdwatchers' high willingness to contribute to wildlife conservation (McFarlane and Boxall 1996; Cooper et al. 2015; Cheung et al. 2017; Shipley et al. 2019) and a higher recreation specialization level among birdwatchers has been found to be associated with higher involvement in conservation behaviours (Hvenegaard 2002; Cheung et al. 2017).

Conceptual framework

As certain wildlife populations have transitioned from depletion to recovery, management strategies incorporate objectives to reduce negative impacts of wildlife on human interests and the ecosystem, alongside conservation efforts (Cammen et al. 2019). To learn about the psychological basis of birdwatchers' willingness to participate in local goose management with diverse objectives, we draw on acceptance of geese reflecting individually constructed evaluations and self-identity processes associated with birdwatching. Acceptance of wildlife has been conceptualized as either an attitude ranging from negative to positive, such as from 'in favour of' to "against" (e.g. Dressel et al. 2015), or as wildlife acceptance capacity reflecting the maximum level of a wildlife population level that is acceptable to people (sometimes labelled 'tolerance') (Decker and Purdy 1988; see also Bruskotter and Fulton 2012; Bruskotter et al. 2015). Attitude is considered a key predictor of intention and behaviour (Eagly and Chaiken 1993), and a more positive attitude towards wildlife as well as a higher acceptance capacity has been found to be associated with increased engagement in conservation behaviours (Bruskotter et al. 2015; Onyishi et al. 2021). However, whereas measures of wildlife acceptance are confirmed predictors of involvement in conservation, there is a limited understanding of how stakeholders' acceptance of wildlife is associated with management where conservation is not the sole aim, and a range of management tools is used. By considering attitude and acceptance capacity simultaneously, diversity in acceptance of wildlife may become visible, thereby enabling identification of consistent negative evaluations (e.g. a negative attitude and low acceptance capacity), neutral evaluations (e.g. a neutral attitude and an average acceptance capacity), divided evaluations (e.g. a misalignment between attitude and acceptance capacity), and consistent positive evaluations (e.g. a positive attitude and high acceptance capacity).

Further, this approach provides an opportunity to analyse how consistent and divided evaluations are associated with behaviours.

Given birdwatchers' interest in birds in general (not only geese), acceptance of geese is one plausible psychological basis for involvement in management. Thus, drawing on research on self-identity (Stryker and Burke 2000), we considered birdwatching experiences and associated identity processes as potentially important for management involvement. Self-identity are meanings attached to the self and individuals generally have multiple identities based on e.g. group membership or role (Stets and Burke 2000; Burke and Stets 2009). In addition, identities vary in how central they are to the overall self, depending on prominence, commitment, and salience (Stets and Biga 2003). Interactions in the social world are important for the formation of self-identities, and since people are motivated to act in congruence with their identities, self-identity influences behaviours (Stryker and Burke 2000). Given that birdwatchers are a heterogeneous group (Hvenegaard 2002; Vas 2017), the meanings attached to a birdwatcher identity may cover diverse sentiments of an individual as a birdwatcher. Thus, based on an identity framework, we suggest that experience of birdwatching (e.g. frequency of birdwatching) should be associated with a stronger birdwatching identity, which in turn, should be positively associated with willingness to get involved in wildlife management. This reasoning is in line with research of recreation specialization, i.e. more specialized experience of birdwatching is important for, e.g. membership in a conservation group (Hvenegaard 2002; Vas 2017; Kruger and Viljoen 2020). Nevertheless, our study is novel by depicting that experiences are the root of a birdwatcher identity (i.e. differentiating psychological processes from behaviours) and by outlining a connection between birdwatcher identity and willingness to get involved in management. Whereas the role of a social identity (i.e. the identification with a social group) has been examined in the conservation literature (e.g. Lute et al. 2014; Bruskotter et al. 2019), self-identity has been given less attention, despite the strong association between self-identity and diverse pro-environmental behaviours (Udall et al. 2020).

The aim of this study is to examine how the acceptance of geese, as well as birdwatching experiences and self-identity, is associated with willingness to participate in local goose management among Swedish birdwatchers. Diverse types of management including taking part in local goose management groups, counting geese as part of monitoring, and mitigating crop damage by scaring geese were explored. First, we examined how evaluations of geese (i.e. attitude and acceptance capacity) were associated with structural characteristics (e.g. gender, age, and region), birdwatcher identity, and willingness to participate in goose management. Second, by drawing on an identity framework, we

analysed the importance of previous birdwatching experiences and birdwatcher identity for willingness to participate in goose management.

Methods

Study context

Nine goose species occur in Sweden; five are breeders, and the other four are transient migrants or winter visitors. Wetlands and coastal meadows are natural goose habitats; but nowadays, agricultural land is the main foraging habitat for geese outside the breeding season. A significant number of geese are present in all 21 Swedish counties, but the highest densities are found in the south (Nilsson 2013).

Goose management in Sweden is part of the international and European goose management platform, which includes multiple levels of governing bodies with decision power as well as arenas for participation. In Sweden, local goose management groups have emerged in areas with a history of conflict over geese on farmland. These local management groups comprise representatives of diverse interests, including farmers, hunters, birdwatchers, conservationists, and the county administrative board (Hake et al. 2010; Tuvendal and Elmberg 2015). Hence, birdwatchers' involvement is needed in local participatory management. In addition, monitoring of goose numbers constitutes an important basis for adaptive management, and it relies to a large extent on volunteering birdwatchers. Scaring of geese is an important management tool to reduce crop damage, especially when hunting is not an option. Such scaring is generally carried out by individual farmers but is also carried out by consultants employed by the county agency (Hake et al. 2010).

Respondents

A questionnaire including a pre-paid return envelope was distributed by mail with the bi-monthly national magazine *Vår Fågelvärld* to members of Birdlife Sweden, the largest birdwatching organization in Sweden, in February 2021 ($n = 15,700$). Approximately 2 months later, after no reminders, the response rate of completed questionnaires was 31.9% ($n = 5010$).

Measures

The questionnaire included questions about socio-demographics and birdwatching experience, geese, and goose management. Only questions analysed for this study are described below.

Socio-demographics

Questions about gender, age, education, occupation, and residence (the latter ranging from altogether rural to cities of more than 100,000 residents, using six categories) were included in the questionnaire. *Birdwatching experience* was assessed by means of three questions: how long time they had been birdwatchers (0–5 years, 6–10 years, 11–20 years, 21–30 years, 31 years or longer) (i.e. *seniority*), how frequently they went birdwatching away from home last year (0–10 days, 11–20 days, 21–50 days, and more than 50 days) (i.e. *frequency away from home*), and how frequently they went birdwatching overall (Every day or several days per week, Several times per month, Approx. one time per month, One or a few times per year, More seldom or never) (i.e. *overall frequency*).

Birdwatcher identity

To assess birdwatcher identity, eight statements reflecting different types of birdwatchers were developed based on previous research of motives for birdwatching and outdoor recreation in general (Decker et al. 1987; Chen and Chen 2015). More specifically, two statements each covered the dimensions: appreciation (i.e. enjoying nature), affiliation (i.e. social relations), achievement, and management involvement. Answers were given on a five-point scale (Completely disagree to Completely agree) (see Table 1).

Attitude, acceptance capacity, and willingness to participate in goose management

The attitude towards geese was assessed by means of two items: “What do you think about having geese present in Sweden?” using a five-point dislike to like response scale and “What is your attitude towards geese?” using a five-point negative to positive response scale (Eriksson et al. 2020). The composite measures displayed good reliability ($\alpha = 0.81$). Acceptance capacity was measured by two questions: (a) “What is your perception of the goose population in your municipality?” using a five-point response scale (Far too few, Too few, Just right, Too many, Far too many) and (b) “What is your perception of whether the number of geese has changed the last 10 years in your municipality?” using a five-point response scale (Diminished a lot, Diminished a little, No change, Increased a little, Increased a lot) (Eriksson et al. 2020). The scales were subsequently reversed so that a higher value reflected a higher acceptance capacity, and a composite measure was created, albeit with rather low reliability ($\alpha = 0.63$). Nevertheless, given that only two items were used, the reliability was considered acceptable. Willingness to participate in goose management was assessed by means of the question: “How likely is it that you would

Table 1 Results from the exploratory factor analysis of birdwatcher identity statements and descriptive results (means and standard deviation)

	Descriptives M (SD)	Factor analysis	
		Factor 1 Factor loadings	Factor 2 Factor loadings
I often report birds to e.g. Artportalen ^a	2.55 (1.63)	.81	-.07
When I have seen rare bird species I tell others or report ^b	3.85 (1.33)	.75	.09
I participate in birdwatchers' networks ^c	2.54 (1.82)	.75	-.06
I regularly watch birds together with others, e.g. family or friends ^c	3.35 (1.39)	.66	.22
For me it is important to identify all birds I see when I watch birds ^b	3.95 (1.14)	.64	.14
I participate in organized bird counts ^a	2.60 (1.59)	.54	-.02
For me, birdwatching is just one way of many to experience animals and nature ^d	4.20 (1.03)	-.07	.85
I watch birds for the total animal and nature experience, not only to see birds ^d	4.43 (0.92)	.16	.81
Eigenvalues	n/a	3.00	1.41
α	n/a	.72	.58
Factor 1: distinct birdwatcher identity	3.14 (1.04)		
Factor 2: appreciation	n/a		

The four dimensions of self-identity measured: ^aWildlife management, ^bAchievement, ^cAffiliation, ^dAppreciation
Factor loadings >.4 in bold

participate in the following activities?" (a) Organized goose counts, (b) Scaring with the aim to reduce goose damage, and (c) A local goose management group with hunters, farmers, ornithologists, and agencies collaborating to prevent goose damage. Responses were provided on a five-point scale (Not at all likely to Very likely). The composite measure displayed satisfactory reliability ($\alpha=0.72$).

Analyses

Analyses were conducted using SPSS 24, except for the identity model, for which AMOS 24 was utilized. Analyses of structural variables were employed to describe the sample, including median, mean, frequencies, and standard deviation for gender (women, men, but not willing to say was treated as missing), age (<65 years, 66–75 years, and >76 years), education (university education, no and yes), residence (rural = 10,000 or less inhabitants and urban = more than 10,000 inhabitants), and region (north = counties Norrbotten, Västerbotten, Jämtland, Västernorrland, Gävleborg; middle = counties Dalarna, Värmland, Örebro, Västmanland, Uppsala, Stockholm, Södermanland; and south = counties Västra Götaland, Östergötland, Jönköping, Halland, Kronoberg, Kalmar, Skåne, Blekinge, Gotland). In addition, birdwatcher identity was examined by means of an exploratory factor analysis with varimax rotation using the eight statements. Associations between birdwatcher identity and structural characteristics were analysed by means of univariate ANOVAs with partial η^2 to assess effect size.

The first objective concerning evaluations of geese and willingness to participate in goose management was analysed using means and standard deviations of attitude,

acceptance capacity, and willingness. To analyse how evaluations of geese were associated with structural characteristics, birdwatcher identity, and willingness to participate in goose management, respondents were divided into four groups based on the measures of attitude and acceptance capacity: "negative" (<3 for both measures), "neutral or close to neutral" (3 for both measures/3 for one measure and <3 or >3 for the other measure), "divided" (<3 for one measure and >3 for the other measure), and "positive" (>3 for both measures). Associations between evaluations of geese and structural characteristics were assessed by means of chi-square tests and Cramer's *V*, and associations between evaluations of geese and both birdwatcher identity and willingness were assessed using univariate ANOVAs and partial η^2 . Effect size was evaluated based on Cohen's rules of thumb with a value of Cramer's *V* of 0.10, 0.30, and 0.50, reflecting a small, medium, and large effect size (when $df=1$), respectively, and with equivalent values being 0.01, 0.06, and 0.14 for partial η^2 (Cohen 1988). In addition, a regression analysis including attitude and acceptance capacity as predictors and willingness as dependent variable was conducted. The variance inflation factor (VIF) was utilized to assess multicollinearity among the predictors.

The second objective, concerning relations between birdwatching experiences (i.e. seniority, frequency away from home, and overall frequency), birdwatcher identity, and willingness to participate in goose management, was analysed by means of a path analysis with the maximum likelihood estimation method. Since there were missing values in the data set (ranging from 0.6–2.2% for the included variables), means and intercepts were estimated. More specifically, seniority, frequency away from home, and overall frequency

were endogenous variables and assumed to be correlated. Each of these was stipulated to be associated with birdwatcher identity, which in turn was believed to be linked to willingness in accordance with the proposed identity model. Model fit was assessed by two absolute fit indices (chi-square and the root mean squared error of approximation, RMSEA) and one relative fit index (Bentler's Comparative Fit Index, CFI). In line with Browne and Cudeck (1993), a RMSEA value of 0.05 or lower was considered indicative of a good fit, with the *P* value of close fit (PCLOSE) revealing whether the RMSEA value differed significantly from 0.05. Furthermore, a CFI value of 0.95 or higher was considered a fairly good fit, as suggested by Hu and Bentler (1999). Path coefficients and standardized multiple correlations were reported for the endogenous variables to determine the level of explained variance.

Results

Descriptives

A majority (74%) of the respondents were men. Median age was 70 years ($M=68$, $SD=12$) and 66% of the respondents were retired. Among the respondents, 67% had a university education and 46% lived in a rural area with 10,000 or less inhabitants. While 51% of the respondents lived in the south region, 40% and 10% lived in the middle and north region, respectively. Compared to the overall Swedish population, the sample is comprised of a larger share of men, the mean age and average education level are higher, and the sample is slightly more rural (Statistics Sweden 2021). Yet, the sample is largely representative for members of Birdlife Sweden in 2020, where 67% were men and median age was close to 69 years (Birdlife Sweden 2021).

More than half of the respondents, 56%, had been birdwatching for more than 31 years, 11% between 21 and 30 years, 14% between 11 and 20 years, and 19% for 10 years or a shorter time. Respondents displayed high levels of birdwatching activity; only 35% were away on birding trips less than 10 days the previous year, and 23%, 21%, and 21% were away 11–20 days, 21–50 days, and more than 50 days, respectively. Moreover, 44% stated that they engaged in birdwatching every day or several times a week, 32% several times a month, 12% approximately once a month, 10% one or more times per year, and only 2% more seldom or never.

Birdwatcher identity

An exploratory factor analysis of the birdwatcher identity statements with varimax rotation revealed two factors explaining 55% of the variance (see Table 1). Factor 1 reflected a distinct birdwatcher identity based on

achievement, affiliation, and management involvement. This factor displayed good reliability, but the reliability of the second, reflecting appreciation, was low. Hence, in subsequent analyses only factor 1 was retained. Analyses of associations between the distinct birdwatcher identity and structural factors revealed that men displayed a stronger identity than women (men: $M=3.24$, $SD=1.04$ and women: $M=2.85$, $SD=0.99$, $P=0.001$, partial $\eta^2=0.03$) and birdwatchers under the age of 65 displayed a stronger identity than older birdwatchers (< 65 years: $M=3.35$, $SD=1.05$, 66–75 years: $M=3.15$, $SD=1.02$, and > 75 years: $M=2.87$, $SD=0.99$, $P=0.001$, partial $\eta^2=0.03$). In addition, respondents with a university education displayed a slightly stronger distinct identity than those without (no: $M=3.08$, $SD=1.05$ and yes: $M=3.17$, $SD=1.03$, $P=0.005$, partial $\eta^2=0.00$). Respondents in the north and the south regions displayed a stronger identity than respondents in the middle region (north: $M=3.23$, $SD=1.06$, middle: $M=3.08$, $SD=1.04$, and south: $M=3.16$, $SD=1.03$, $P=0.004$, partial $\eta^2=0.00$). However, the distinct birdwatcher identity was not significantly associated with residence (rural: $M=3.14$, $SD=1.03$ and urban: $M=3.14$, $SD=1.04$, *ns*).

Attitude, acceptance capacity, and willingness to participate in goose management

The respondents displayed a positive attitude towards geese ($M=4.33$, $SD=0.67$), but a fairly low acceptance capacity ($M=2.43$, $SD=0.71$). By considering attitude and acceptance capacity simultaneously, results further revealed that only 2% displayed a consistently negative evaluation of geese, 25% a neutral or close to neutral evaluation, 64% a divided evaluation, and finally 10% a consistently positive evaluation of geese. The respondents' overall willingness to participate in goose management was generally low ($M=2.10$, $SD=0.99$). The willingness was slightly higher for participating in organized goose counts ($M=2.73$, $SD=1.45$) than for participating in a local management group ($M=2.02$, $SD=1.25$). The lowest willingness was found for participation in scaring geese ($M=1.53$, $SD=0.92$).

Evaluations of geese were significantly associated with gender, age, education, and region, yet the effect size was generally small (see Table 2). Nevertheless, women were more likely to display a positive or a neutral/close to neutral view of geese compared to men, and men were more likely to demonstrate a divided evaluation of geese than were women. It was also more common in the north region compared to the other regions to evaluate geese favourably and more common in the south region to display a divided evaluation of geese. In addition, evaluations of geese were significantly associated with birdwatcher identity and willingness to participate in goose management. The divided

Table 2 Structural factors, birdwatcher identity, and willingness to participate in goose management as a function of evaluations of geese

		Negative	Neutral or close to neutral	Divided	Positive	Effect size
		%	%	%	%	Cramer's V
Gender***	Women	3	33	52	13	.15
	Men	2	22	68	9	
Age***	> 65 years	1	25	60	13	.07
	66–75 years	2	23	68	7	
	< 76 years	2	26	62	10	
University education**	No	2	27	61	11	.05
	Yes	1	24	65	10	
Place	Rural	2	24	63	11	.03
	Urban	2	25	64	9	
Region***	North	1	26	55	18	.08
	Middle	2	27	61	10	
	South	2	22	68	8	
		<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	Partial eta ²
Birdwatcher identity***		2.66 (0.95) ^a	2.94 (1.02) ^a	3.24 (1.03) ^b	3.12 (1.03) ^b	.02
Willingness***		1.94 (1.13) ^a	1.97 (0.98) ^{a,b}	2.15 (0.98) ^c	2.13 (0.97) ^{a,c}	.01

P* < .01; *P* < .001

Means having the same superscript letter did not differ at *P* < 0.05

The superscripted 2 denotes partial eta square and does not need to be explained

and the positive groups showed a stronger birdwatcher identity than both the neutral/close to neutral group and the negative group. Furthermore, the divided and positive groups displayed a higher willingness than the other groups, yet the group with a positive evaluation did not significantly differ from the group with a negative evaluation, potentially due to the low sample size and large standard deviation in the negative group. Residence was not significantly associated with evaluations of geese. The results from the regression analysis of evaluations as predictors of willingness revealed no evidence of multicollinearity (*VIF* = 1.07). A more positive attitude ($\beta = 0.19^{***}$) but a weaker acceptance capacity ($\beta = -0.08^{***}$) were found to be associated with a higher willingness to participate in goose management (*Adj R*² = 0.03^{***}).

Path analysis of the identity model

Path coefficients and standardized multiple correlations for exogenous variables from the path analysis are displayed in Fig. 1. The results revealed that the three measures of birdwatching experience were positively correlated, and each had a significant positive effect on the distinct birdwatcher identity, with frequency of birdwatching away from home being the strongest predictor. In turn, a stronger distinct birdwatcher identity was associated with a higher willingness to participate in goose management. The model explained 38% of the variance in identity and 15% of the variance in will-

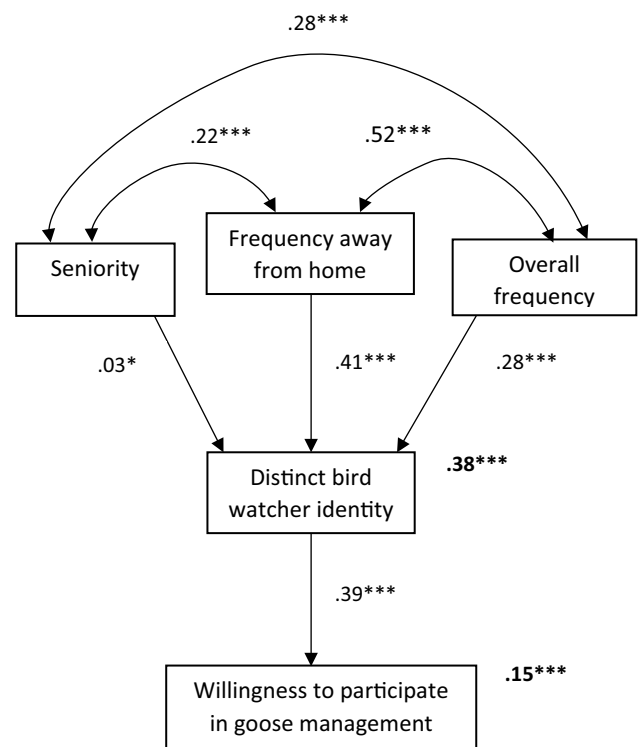


Fig. 1 Birdwatching experiences and distinct birdwatcher identity as predictors of willingness to participate in goose management (path coefficient significant at *** *P* < .001, **P* < .05, squared multiple correlations in bold)

ingness. As commonly found when sample size is large, the χ^2 value was significant, indicating that fit was poor ($df = 3$, $\chi^2 = 22.29^{***}$). However, the other goodness-of-fit measures confirmed a very good model fit (RMSEA = 0.04 (90% confidence interval = 0.02–0.05, PCLOSE = 0.945), CFI = 0.99).

Discussion

There is a growing need for involvement of diverse stakeholder groups in participatory goose management in Europe (Tuvendal and Elmberg 2015; Eriksson et al. 2021a). This study examined evaluations of geese and willingness to participate in local goose management in a large sample of Swedish birdwatchers, an important stakeholder group in this context. The study highlights the importance of broadening the scope from conservation groups' involvement in wildlife conservation to management in more general terms, and it provides insights important for a more inclusive goose management.

The sample of birdwatchers was derived from members of a national birdwatching organization, not, e.g. self-identified birdwatchers, and can therefore be considered rather specialized (cf. Lee et al. 2015). The sample contained a high share of men, older, and more highly educated people, which is largely in line with the demographic profile of birdwatchers in recent studies (Lee et al. 2015; Vas 2017, but see Randler 2021). The measure of birdwatcher identity embraced sentiments of achievement, affiliation, and wildlife management involvement. It differs from a general appreciation for nature, thus supporting a divergence between a distinct birdwatcher identity versus one where birdwatching is part of an outdoor recreation identity. This distinct birdwatcher identity was stronger among men than women, which is in line with the gender difference in birdwatching styles revealed in previous studies (cf. Lee et al. 2015). However, whereas recreation specialization has been found to be positively associated with age (Hvenegaard 2002), the present study found that younger birdwatchers displayed a stronger distinct birdwatcher identity than did older birdwatchers. Although seniority was positively associated with the two measures of birdwatching frequency, seniority only had a weak effect on identity, indicating that the distinct birdwatcher identity had less to do with the number of birdwatching years and more to do with involvement in watching birds. This result is in line with research showing that recreation specialization may not follow a linear trajectory across the age span (Backlund and Kuentzel 2013). In order to learn about the formation of a recreational identity, our study also suggests a need to examine the role of diverse experiences and interactions associated with the activity.

A large majority of birdwatchers in this study displayed a divided evaluation of geese, most commonly a positive attitude coupled with a low acceptance capacity. Thus, the size of goose populations was considered a challenge. This

pattern may be linked to the fact that the superabundance of some goose species actually leads to eco-system disservices, including negative impact on ecosystems and on other wild birds. Compared to a study of the general public in Sweden (Eriksson et al. 2020), birdwatchers in the present study displayed a higher appreciation for geese than did the public, but they shared the view that abundant goose populations may represent a challenge. Given that large numbers of geese concentrate to certain hot spots mainly in the south of Sweden for much of the annual cycle (Nilsson 2013), the higher share with a consistently positive evaluation of geese in the north region and the higher share with a divided evaluation of geese in the south region may reflect different experiences of geese in these contexts. The results further revealed that the willingness to get involved in goose management was low, with the strongest willingness found for counting geese and the weakest for scaring them. Yet, as indicated by the coherence of the willingness measure, birdwatchers that were more willing to engage in one management activity were also more willing to engage in the others. Birdwatchers with a divided evaluation, also those with an overall positive evaluation of geese, displayed the strongest willingness to participate in management. Hence, whereas involvement in conservation has been found to be associated with a positive attitude and higher acceptance capacity (Bruskotter et al. 2015), our study indicates that an entirely positive evaluation and also a divided one may be linked to involvement in management with multiple objectives. Future studies should examine how appealing a broad set of management involvement is to birdwatchers, such as taking part in evaluations of goose management measures and contribute with their knowledge about species to hunters' education. In addition, involvement in goose management in other relevant stakeholder groups (e.g. hunters) needs to be studied.

Even though evaluations of geese were associated with willingness to participate in goose management, overall birdwatcher experiences via a distinct birdwatcher identity explained a higher level of variance in willingness. Thus, whereas our study, in line with Eriksson et al. (2020), confirms that place-based experiences matter for evaluations of geese, involvement in management may be more strongly associated with an overall involvement in birdwatching activities. Our study adds to previous research by suggesting a link between experience of birdwatching and identity processes as well as between birdwatcher identity and willingness to participate in management. In addition, it is complementary to studies of birdwatchers' explicit motives (e.g. Randler 2021) since it suggests that underlying identity processes can be used to clarify why birdwatching is important to different birdwatchers. For example, the distinction between achievement, affiliation with others, and management involvement versus appreciation for nature is interesting and may be particularly relevant to consider

in studies of participation in management. However, since the measure of birdwatcher identity was based on an exploratory analysis, there is a need to confirm these results in independent samples (e.g. by including a more diverse set of identity statements). The identity framework explained barely 15% of the variance in willingness. However, given that the model included only one predictor and the willingness measure may have suffered from a floor effect, this is reasonable. Whereas one strength of using the identity framework is to highlight how general psychological processes are relevant for a specific behaviour, this framework may also be integrated with, e.g. the theory of planned behaviour to elaborate on the importance of both general and behavioural specific cognitions (cf. Fielding et al. 2008). In addition, future research needs to not only study psychological processes but also to explore how, e.g. social and institutional factors may play a role for stakeholders' willingness to get involved in wildlife management.

When interpreting our results some limitations should be considered. No reminders were used to boost response rate in this study, yet the sample was large and did not deviate greatly from the general membership of Birdlife Sweden (although with a slightly larger share of men). The sample of respondents was furthermore largely comparable to several recent survey studies of birdwatchers (Chen and Chen 2015; Lee et al. 2015; Cheung et al. 2017; Shipley et al. 2019; but see Randler 2021). Nevertheless, birdwatchers with an interest in geese may have been more prone to respond to the survey. Even though measures were developed based on theory and previous research, the measure of acceptance capacity displayed a slightly low internal reliability. Even though this measure had an acceptable internal reliability in Eriksson et al. (2020), future studies should consider increasing the number of questionnaire items used to assess this measure. Given space limitations, we did not distinguish between different goose species in the questionnaire but rather allowed the respondents' experience to be used as the starting point for evaluations. Based on contacts with respondents and comments, evaluations of geese in this study are likely to be in reference to abundant rather than scarce or threatened goose species.

Conclusions

This study revealed a low willingness to participate in goose management among Swedish birdwatchers, thus suggesting that it may be difficult to involve them in local multi-stakeholder goose management. Recruiting participants to, e.g. goose counts may nevertheless be fruitful, especially if active birdwatchers are targeted, rather than the broad member base of birdwatching organizations. However, given that people have multiple identities (Stets and Burke 2000), the distinct birdwatcher identity needs to be made salient to encourage involvement. Since a larger share of birdwatchers

are men and belong to older age groups, special consideration should nevertheless be given to engage women and younger birdwatchers to ensure diversity and continuity in stakeholder engagement. While the multi-level management system of geese in Sweden is emerging, transparency of management outside the system may be limited (Eriksson et al. 2021b). To pave the way for involving a broader range of stakeholders in management, there may be a need for improving the relationships between the system and stakeholders, including conservation focused groups. Through involvement in management, birdwatchers have the possibility to ensure that conservation needs are considered, not only in objectives but also in management practice. The large number of birdwatchers with a divided evaluation of geese indicates that this group may to some extent acknowledge farmers' problem perceptions (cf. Eriksson et al. 2020). However, whereas shared problem perceptions may constitute a constructive basis for building participatory management, diverse value orientations may still cause disagreement regarding acceptable goose management measures, indicating a need for a continuous dialogue even with stakeholder groups not directly involved in management.

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Availability of data and material The datasets generated and/or analysed for the current study are available from the corresponding author on reasonable request.

Code availability NA.

Declarations

Ethics approval The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki. The study was voluntary and based on informed consent. Data were furthermore collected anonymously. Since no sensitive personal information was collected, as defined in Swedish legislation, no explicit ethical approval was required for this study.

Conflicts of interest The authors declare no competing interests.

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