



IFRO Working Paper

Motivations of volunteers in Danish grazing organisations

Sari F. Madsen
Niels Strange
Jesper S. Schou

2019 / 09

IFRO Working Paper 2019 / 09

Motivations of volunteers in Danish grazing organisations

Authors: Sari F. Madsen, Niels Strange, Jesper S. Schou

JEL-classification: Z18, Z32

Published: December 2019

See the full series IFRO Working Paper here:

www.ifro.ku.dk/english/publications/ifro_series/working_papers/

Department of Food and Resource Economics (IFRO)

University of Copenhagen

Rolighedsvej 25

DK 1958 Frederiksberg DENMARK

www.ifro.ku.dk/english/

Motivations of Volunteers in Danish grazing organisations

Sari F. Madsen, Niels Strange¹ and Jesper S. Schou^{1*}

¹Department of Food and Resource Economics, Rolighedsvej 25, 1858 Frederiksberg, Denmark

*Corresponding author: jss@ifro.ku.dk

Abstract

Global biodiversity is under pressure from human activities, and despite the expansion of protected areas, investment in nature conservation and restoration, and allocation of economic resources for managing existing conservation is insufficient. Therefore, volunteers can play an important role as a resource in nature conservation projects if their recreational activities interact with the objectives of nature management. In recent years, the number of volunteers in conservation work has increased in Denmark, with more people volunteering to contribute to nature conservation projects. Ensuring that volunteers remain motivated and engaged is crucial to the success of such conservation projects. In this study, we evaluate the motivation among members of grazing organisations, an activity which represent the most prominent voluntary nature conservation initiatives in Denmark. We apply exploratory factor analysis (EFA) and ordinal regression to analyse survey data from 25 Danish grazing organisations. We find that five motivational factors are determining the engagement of the volunteers, namely social, nature value, instrumental, identification, and personal benefit. Whereas the social, nature value and personal benefit are factors also identified in the existing literature, the instrumental and identification factors add new perspectives to the motivation of environmental volunteers. We find that place attachment is an important driver, and that the chairpersons/coordinators of the grazing organisations especially emphasized the sharing of values and knowledge with their members as a driver. Last, volunteers were reluctant to support the idea of forming a more formal setup in terms of a “Grazing organisation union”.

Keywords: Volunteers, Motivational Factors, Conservation, Grazing Organisations.

1. Introduction

Global biodiversity is under huge pressure from human activities and nature is declining globally at rates not seen before in human history (Ceballos et al. 2015). The IPBES global assessment (2019) reveals that more than a third of the world surface is devoted to crop or livestock production. Despite an increase in the numbers of protected areas (Kuempel et al., 2018) and global spending on nature restoration and preservation (Waldron et al., 2013), funding and efforts on existing protected areas are still considered insufficient (Le Saout et al., 2013) and the lack of financial resources is one of the main barriers. One way of addressing the lack of resources is to increase attention to non-financial and voluntary activities to enhance both biodiversity and improve human livelihood (Rode et al., 2016). Especially in areas close by urban settlements, urban conservation efforts matter and offer a solution to the lack of resources for nature conservation as it offers possibilities for rerouting volunteers who devote their time and other resources to restore and conserve biodiversity for altruistic reasons and to gain socio-psychological benefits (Asah & Blahna 2012).

Substantial research has focused on investigating landowners' motivation or willingness to contribute to nature and landscape conservation mainly performed by the land owner (Paloniemi et al., 2017; Selinske et al., 2014), or on what motivates volunteers to participate in citizen science projects (Rotman et al., 2012), conservation tourism, or conservation and wildlife initiatives (Asah et al., 2014; Bramston et al., 2010). Environmental volunteers have been studied in various contexts such as the conservation of forests (Adhikari et al., 2007; Messier et al., 2014) freshwater (Kreutzwiser et al., 2011), grasslands and rangelands (Appiah-Opoku, 2007; Henderson et al., 2014; Sayre et al., 2013) but few studies have focused on the diversity of motivations for volunteering. Understanding what motivates individuals to participate in volunteering could play a significant role in ensuring the success of conservation projects and empower the role of volunteers in nature conservation. Therefore, citizens' motivation for participating in practical nature management on public and private areas still needs to be understood (Larese-casanova and Hill, 2018), and additionally understanding why they continue to volunteer (Liarakou et al., 2011; Omoto and Packard, 2016).

The contribution of our study builds on previous research on voluntarism by exploring which factors that motivate volunteers for nature conservation and sustain their motivation, by exploring Danish nature volunteers organised in grazing organisations managing public and privately owned land.

In this paper, we explore the motivational properties of members participating in voluntary grazing organisations in Denmark. First, we introduce the general literature of motivational research and then we focus on the literature on motives for environmental and nature volunteering in order to identify the motivational factors to be explored in the case study. Then we present the data and methodology used in the case study followed by the results, and last, we discuss the findings and present the conclusions.

2. Voluntarism

2.1. Motivational research on volunteering

Volunteers' commitment and engagement can be explained by completely different motivational processes (see Table 1). Therefore, forming a universal theory for volunteer motivation is a significant challenge (Hustinx et al., 2010). Clary et al. (1998) applied a volunteer functions inventory (VFI) to identify six socio-psychological benefit of volunteering: 1) understanding, 2) strengthened social ties, 3) expressed altruistic values, 4) protecting the ego from negative feelings, 5) enhancing psychological growth, and 6) career related experience. This inventory has since been used in many studies to investigate volunteers' motivation (Bruyere and Rappe, 2007; Selinske et al., 2014), as it offers a guide to stakeholders and managers, in need of understanding what this group of contributors can offer and create the most effective and generative collaboration, and as a measure for fulfilment of the nature volunteers' values.

Volunteering is often more attractive to resource-rich individuals, who already have the capital and/or knowledge required for participation (Einolf and Chambré, 2011). In general, volunteers have a job, are well-educated, are wealthier and healthier, and have a large social network than non-volunteers (Choi, 2003; Erlinghagen et al., 2005; Principi et al., 2016; Wymer, 1999). Thus, the level of education is the most consistent predictor of volunteering. The higher a volunteer's level of education, the more likely they are to volunteer. It may be due to a larger network, and therefore a greater likelihood of being encouraged to volunteer and because well-educated people are more likely to be aware of problems that need attention (Measham and Barnett, 2008; Wilson, 2000). High levels of education were found to be associated with volunteering for altruistic reasons, but also to reduce negative feelings, such as guilt and loneliness (Principi et al., 2016). The presence of children, especially if living at home, may affect the degree of volunteering, depending on the type of volunteer work, civil and employment status of the parents, and the age of the children and parents. Parents

with children living at home are more likely to volunteer, but this will be for fewer hours if the children are young (Wilson, 2000). If children can be involved in the volunteer activity, the parents are motivated by a desire to transmit values, be a role model, and have fun and spend time together (Littlepage et al., 2003). Friends, social roles and social networks are key factors that influence behaviour and opportunities in a person's life. Having friends involved in volunteering has a positive effect on an individual's volunteer involvement (Einolf and Chambré, 2011). Most volunteers have been encouraged to join a cause, which is why social ties are important for volunteer involvement (Hjortsø et al., 2006). Such individuals may be motivated to volunteer by the social opportunity of spending time with their friend (Ryan et al., 2001).

Table 1. Summary of findings regarding the link between demographic and motivational in volunteer research.

Factor	Findings
Age	<p>Low social capital, through lower education, poorer health. More prone to volunteer for social reasons.</p> <p>Age above 60 increases the chance of volunteering.</p> <p>As age increase motivation changes, learning and career becomes less important.</p>
Gender	<p>Males and female generally volunteer the same number of hours.</p> <p>Worldwide females volunteer slightly more than male.</p> <p>In Europe, males do not volunteer more than female and vice versa.</p> <p>Life stage (young and old) affects the female to male ratio.</p> <p>Females generally put more importance into all motivations found in previously studies, while males see volunteering more as completing a task.</p>
Education	<p>Most influential predictor of volunteering, as a reflection of more awareness and resources.</p> <p>Levels of education were associable to volunteering for value reasons, social reason and reduce negative feelings, such as loneliness.</p>
Children	<p>Parents with children, living at home, was likely to volunteer.</p> <p>People with young children volunteer fewer hours.</p> <p>Adults who can involve children in the voluntary work, are often motivated by transmitting values, opportunity to be a role model, having fun and spend time together.</p>
Friends	<p>Having friends involved in volunteering positively affects your own involvement.</p> <p>People already having friends involved, may be motivated by the social opportunity to spend time with these friends.</p>

Ethical and moral values are often a major motivational factor among volunteers (Alender, 2016; Chacon et al., 2011; Davila and Díaz-Morales, 2009). Age has been linked to volunteering as it expresses a measure for stock of resources, which changes over a lifetime. Volunteering occurs at all ages, but certain life stages are particularly associated with volunteering. Middle-aged people between 35–44 years show the highest rates of volunteering (Measham and Barnett, 2008), while people above 60 years, are more likely to volunteer and continue volunteering compared to younger generations (Einolf and Chambré, 2011). Younger people are more motivated for education and forging a career, while life existence goals become more important later in life, especially generative goals where “taking responsibility for future generations” becomes stronger (Alender, 2016; Davila and Díaz-Morales, 2009). However, the frequency of volunteering may decrease with age caused by decreasing social capital, poor health, or becoming widowed (Clary et al., 1998). Gender may have an influence on volunteering, but the results are ambiguous. In some geographical settings it is found that women volunteer more than men and in others there is no difference (Bussell and Forbes, 2002). It is generally found that females volunteer more when they are young, while males volunteer more when they become older (Wilson, 2000). It is found that females attach more importance to the six VFI motivations than males do (Papadakis and Frater, 2004).

2.2. Exploring motives for environmental and nature volunteering

Strzelecka et. al's results from 2017 suggested that environmental volunteer (travellers/tourism) is mainly driven by a belief that participation in ecological restoration is a worthwhile activity. The motivations to participate in an ecological restoration project can be strengthened or weakened depending on the promise of a pleasurable experience. This also indicated that there may be a difference between initial motivation and motivation for long term continuation in volunteering.

In general, the motivation of volunteers can be connected to one or more of the key elements of the VFI (Clary et al., 1998). However, this may not always be sufficiently comprehensive to capture all the motivations for volunteering among environmental volunteers. Schroeder (2000) found improved environmental outcomes to be the primary motivator for individuals becoming involved in restoring degraded habitats, preserving wilderness areas or improving natural resources. Environmental motivations were also found to be linked to, or associated with, desired social outcomes such as a desire to be social or fulfil economic, health, physical or cultural needs (Bennett et al., 2018). In other words through participation in conservation initiatives, the volunteers gain both pleasure as well as a sense that their actions are needed to defeat the increasing global environmental degradation

(Strzelecka, Nisbett and Woosnam, 2017). Jacobson et al. (2012) found that years of volunteering was negatively correlated with the advancement of career goals or experience, but positively correlated with a motive to help the environment. Environmental volunteers' long-term commitment was, in general, more closely associated with a motivation to protect the environment (nature values), whereas episodic volunteers were more motivated by a need to reduce negative feelings or to develop personally.

Ryan et al. (2001) added five factors important for commitment and motivation of volunteers in environmental stewardship programmes: 1) Learning: using the volunteer opportunity to learn new things about the environment; 2) Helping the environment: an opportunity to do something good for the environment; 3) Social: meeting new people or spending time with family and old friends; 4) Reflection: using the volunteer experience to reflect, and; 5) Project organisation: the opportunity to participate in a well-organised project, where time is used efficiently.

Motivation among environmental volunteers may also be associated with attachment to a local environment and sensing a need to contribute to the local community (Bramston et al., 2010; Measham and Barnett, 2018; Takase et al., 2018). Although Selinske et al. (2015) did not study environmental volunteers but private landowners' willingness to voluntarily participate in conservation of their land, they found that environmental or conservation values were the strongest motivator, closely followed by place attachment to their land.

Many of the motivational factors identified in the literature review above have been confirmed by studies that investigate motivation among environmental volunteers, both in larger and smaller scale (Alender, 2016; Bruyere and Rappe, 2007; Measham and Barnett, 2008).

2.3. Nature volunteering in Denmark

Approximately 39% of the Danish population volunteer (Center of Volunteering for Social Work, 2017), but only about 1% volunteer in nature protection activities, although 30% express a wish to do so (Hjortsø et al., 2006). The Danish voluntary community is a combination and collaboration of nationwide organisations, funds and public authorities (the state, municipalities, etc.), and nature volunteer programmes e.g. organised by the Danish Society of Nature Conservation (DSNC). Focusing on the management of many of Denmark's most important and recognizable natural habitats the lack of large grazers are considered one of the largest issues (Svenning et al., 2016). Collaboration between nature volunteers and landowners (public and private) provides

opportunities to establish more differentiated nature management, often in small nature areas, which can be hard to manage due to poor accessibility or difficult terrain (e.g. steepness or high soil moisture). Such areas may however be important for supporting threatened species, which depend on open nature areas. Grazing supports the structure and composition within such habitats and is essential for a variety of plants and animals (Svenning *op cit.*).

Although no official census exists, it is estimated that approximately 300 grazing organisations exist distributed all over Denmark, which contribute to the management of small-scale open nature areas. Most of the grazing organisations are located in urban surroundings and in the proximity to the place of residence of the members/volunteers. The formation of a grazing organisation is often encouraged or kick-started by the municipality, the local department of the DSNC or a local enthusiast (The Danish Society of Nature Conservation, 2006). Once formed, the organisations are usually self-driven, bottom-up managed often in collaboration with the land owner. In this respect the grazing organisations differ from the typical volunteer initiatives (Alender, 2016; Bruyere and Rappe, 2007; Measham and Barnett, 2008). On the other hand, one crucial similarity is that the grazing organisations are highly dependent on recruiting volunteers and keeping them motivated to continue being members and active.

3. Data and Methods

3.1. Data collection

This exploratory study includes survey data collected from members of 25 grazing organisations, which are geographically distributed across Denmark, but with the majority located in NE Zealand, supplemented by a few on Funen and in Jutland (Fig. 1). All organisations allowed a questionnaire to be circulated among their members and the answers are used as the primary data in this study (n=347).

Data was collected using an online survey between 28th November, 2017 and 14th January, 2018. The language of the questionnaire was Danish as all the participants were native Danish speaking. The questionnaire was constructed using Google Forms and distributed by email to the chairpersons of the organisations, who then distributed it to the members of their organisation in accordance with the Danish Privacy Act law (The Danish Ministry of Justice, 2017).

Fig. 1. Location of the voluntary grazing organisations participating in the study.



The questionnaire was structured into five sections containing questions on demographic values (gender and age), and motivation and attitudes. The questions addressing motivation were designed using inspiration from other volunteer motivation research e.g. Asah et al., 2014; Bramston et al., 2010; Bruyere and Rappe, 2007; Clary et al., 1998; Guiney and Oberhauser, 2009; Ryan et al., 2001 and Selinske et al., 2014. Further, we specifically addressed the project organisation, the management of the voluntary organisations and the linkage to other conservation programmes.

The structure of the questionnaire was as follows:

- 1) A compulsory section, which collected background and socio-demographic information.
- 2) A voluntary section with statements about the members' motivation, evaluated on a 5-point Likert scale (1=strongly disagree to 5=strongly agree), including an "I don't know" option.

- 3) A voluntary section about the members' attitudes toward membership (including sharing of the organisation's values, the reason for becoming a member and connection to the organisation), evaluated on a 5-point Likert scale similar to section 2.
- 4) A voluntary section with open-ended questions, which was designed to assess the participants' motivation; if they like the idea of a union for all grazing organisations in Denmark;
- 5) Finally, an opportunity for them to comment on the questionnaire or share any additional thoughts.

Before conducting the full-scale survey we tested the questionnaire in a pilot study by the Laanshoj grazing organisation and in the Facebook group 'Grazing organisations for nature active citizens' (Græsserforeninger for naturaktive borgere). In total, eight individuals participated in the pilot study and their input contributed to design the final version of the questionnaire.

As no validated statistics exist on the number and location of voluntary grazing organisations in Denmark, we were not able to design a stratified data sampling strategy. Instead, we contacted 120 voluntary grazing organisations included in the DSNC's nature management network (The Danish Society for Nature Conservation, 2017). Twenty-five of these responded to the questioner and formed the data of the study. Most of the 25 organisations were established since year 2000 around larger cities, including Copenhagen. The locations managed by the voluntary organisations ranged from 1 ha to 11 ha (mean 8.1 ha, median 7.5 ha), and are fully or partially covered by a conservation order (e.g. §3 in the Danish Nature Protection Act). Sixty percent of the locations are owned by municipalities, whereas the remainder are owned by the Danish Nature Agency and private landowners. The organisations had, on average, 37 members, practised summer grazing (May to September) with leased or bought animals on areas with an average size of 8 ha. All organisations had a dual-purpose; 1) to manage and conserve nature, and; 2) to produce organic meat with a high degree of animal welfare.

3.2 Analysis

Data was organised and coded in Microsoft Excel 2016 to construct descriptive statistics. Initially KMO and Bartlett's Test of Sphericity coefficient were used to test the data fit for factor analysis. Then members' responses to the motivational questions of the questionnaire were analysed using Exploratory Factor Analysis (e.g. Costello and Osborne 2005), which is a multivariate method that

enables the survey information to be reduced from several statements into fewer unmeasured variables, termed factors. These statistical analyses were completed using R Studio v.3.4.2 (R Studio Team 2017) and the package Psych: Procedures for Psychological, Psychometric, and Personality Research version 1.8.10 (Revelle, 2018). If the p value of the model was larger than the chosen significance level ($p > 0.05$), the tested number of factors efficiently described the underlying variables. The null of this test was that the tested number of factors were sufficient for our model.

Having determined the number of factors, their loadings were used to connect the variables to a specific factor¹. Factors which connected less than three variables were not included in the analysis (Costello and Osborne, 2005). Connections between demographic variables and motivation statements were analysed using an ordinal approach. Due to the nature of the data, we applied backward reduction and a CLM (Cumulative Link Model) to fit the data (Christensen, 2011). The fitted model was analysed using ordinal regression, to find relations between motivation and background measurement e.g. membership status. The tests were completed using Rstudio 2017 (R Core Team, 2017), package Ordinal Regression Models for Ordinal Data version 2018.8-25 (Christensen, 2018). As a post hoc, pairwise comparison (EMMEANS) of the groupings within a measurement, e.g. chairperson, vice chairperson, member and support member, were completed using the package EMMEANS: Estimated Marginal Means, aka Least-Squares Means version 1.3.0 (Lenth et al., 2018).

4. Results

4.1. Descriptive results

In Table 2 an overview of the grazing organisations are presented. 347 members responded to the questionnaire, corresponding to approx. 38% of all possible answers². All the contacted organisations were represented and most of the responding members were *regular* members. The volunteer group had an almost equal number of males (53.3 %) and females (46.7%), and a third were brought up in the city, suburbs or countryside, respectively. The organisations' foundation dates span from 1990-

¹ Variables with low loadings were kept, if they had a strong theoretical connection.

² Where number of members are reported in households it was assumed that one from each household had been able to participate.

2017, reflected in years of membership, where almost a third has been members in 1-5 years, more than 5 years or from the foundation of their organisation.

The typical volunteer was in their middle to late adulthood with no children living at home, had a long education, and worked full-time or was retired.

Table 2: The basic information for the 25 grazing organizations, incl. Name of organization, year of foundation, area size, land owner, economic support, advice contact, animal, number farm animals

Organization	Foundation year	Area size** (Ha)	Land owner	Conservation order	Economic support/funding (EU, Ha etc.)	Does the owner provide facilities (fencing, water, power etc.)	Advise contact	Number of members	Animal	Number of Animals
Arrenaes grazing organization (AN)	2013	8.5	The Danish Nature Agency	General conservation order and §3 protection; grassland (partly)	Support pr. Hectare and EU subsidies	Fencing and water	Agrovi	50	Cattle	12
Bondemosens grazing organization (BM)	2002	7.7	Nyborg municipality	§3 protection; fen	Support pr. He and grazing subsidies	Fencing and power	None	40	Cattle	10
Copenhagen grazing organization (CPH)	2014	25	Copenhagen municipality	§3 protection; fen (North enclosure)	None	Fencing	None	144	Cattle	17
Dalbyhoj grazing organization (DH)	2008	7.5	Kerteminde municipality and Odense harbour	§3 Protection; grassland	None	Fencing	None	34	Cattle	9
Furesoe grazing organization (FS)	2002	7	Private	Conservation order (new), §3 protection; fen (partly)	None	none	None	25-30 households	Cattle	6 + calves
Hjortespring nature conservation association (HS)	2002	8.1	Herlev municipality	General conservation order. FTF enclosure partly §3 protected; fen	None	Fencing, power and water	None	48 households	Cattle & sheep****	9 cattle, 14 lambs, and 12 sheep
Hojmosen grazing organization (HM)	2016	4	Copenhagen municipality	General conservation order. §3 protection; meadow	Other	A club house shared with the football club	None	80	Cattle	4
Jyllinge Holme sheep association (JH)	1990	11	The church and Roskilde municipality	Natura 2000 : Semi-natural dry grasslands and shrubland (6210) and Atlantic salt meadow (1330), and §3 protection	Grazing subsidies, agricultural subsidies	Fencing	None	20	Sheep	36 sheep, 1 ram and lambs
Kasted fen grazing and conservation organization (KF)	2008	9.1	Aarhus municipality and private	Enclosure 1+ New: §3 protection fen (partly). Enclosure 2; §3 protection,	Grazing subsidies	Fencing and water	None - resources	85	Cattle	15

				meadow enclosure 3 §3 protection; fen and meadow			within the organization				
Kelleris grazing organization (KR)	2013	8	The Danish Nature Agency	General protection order	None	Water & shelter	None	21 households	Cattle & sheep****	8-10	
Kodriverne (KD)	2008	8	The Danish Nature Agency	§3 protection; fen and meadow	None	Fencing, water, power and shelter	None	approx. 50	Cattle	8	
Konusserne (KN)	2008	2	Private	§3 protection fen and grassland	None	None*	None	9 households (2 inactive)	Cattle	2	
Munksoegaard grazing organization (MSG)	2001	18.8	Munksoegaard and Roskilde municipality	Enclosure F, §3 protection; fen and meadow.	Grazing subsidies	Fencing, power and water	None	5	Cattle	10	
Nivaa sheep breeding association (NSBA)	1991	3	Den Hageske Stiftelse	§3 protection; meadow and grassland (small parts near the edges)	Other	None	Sheep breeders and experts	98	Sheep	14	
Petersminde grazing organization (PM)	2015	4	Vejle municipality	§3 protection; grassland	None	Fencing	None	13	Cattle	4	
Saerlose grassland forest boar and grazing organization (SG)	2016	2.3	private	§3 protection: Grassland. Natura 2000, Asperulo-Fagetum beech forests (9130), a small part.	None	Fencing, water and power	Anna Bodil Hald, (one time)	14	Cattle	2	
Slaglunde grazing organization (SL)	2006	5.5	Egedal municipality	§3 protection; meadow	None	None	None	7+	Cattle	10	
Slotsmosens grazing organization (SLM)	1996	4	Frederikssund municipality	§3 protection: Fen. Part of the enclosure	None	Power and materials for fencing	None	16	Cattle	4	
Soellerod nature conservation- & grazing organization (SOR)	1999	3.2	Jaegersborg forest district	General conservation order, Part of Soellerod National park	None	Fencing, power and water	None	32	Cattle	8	
Sondermarkens grazing organization (SOM)	2009	12	Vejle municipality	None	None	Fencing and power	None	30	Cattle	3	
Soroe grazing organization (SR)	2006	20.6	Stiftelsen Soroe Akademi	General conservation order, §3 protection meadow for Banefolden (BFO) and	None	Fencing, power and water	None	40 households	Cattle	25	

				Bagflommen (BFL) §3 protection grassland Flommen (FL) §3 meadow, Bimosen (BM)					and persons	
Svogerslev grazing organization (SVL)	2017	6.4	Roskilde municipality	Natura 2000 for the area as Semi-natural dry grasslands and shrubland (6210) (small part)	None	Fencing, power and water	None	15	Sheep	34
Taarnby conservation organization (TB)	1997	1	Taarnby municipality	General conservation order.	None	None	None	10	Cattle	6
The grazing organization of Avedoere salt meadow (AS)	2002	13	Hvidovre municipality	General conservation order §3 protection; salt meadow	None	Fencing and shelter	None	24	Sheep households and cattle	23 (7 sheep,11 lambs and 5 cattle
Utterlev grazing organization (UT)	2007	2	Copenhagen municipality	General conservation order and §3 protection, meadow	None	Fencing, power, water and mowing	None	18	Sheep households	9 and lambs

* The fence was funded by Nyborg municipality. ** Area sizes were found on ArealInfo 2017 and were therefore approximate numbers. *** Number of animals were based on season 2017. **** Only the cattle grazed enclosures were investigated

Most members lived close to the area they managed; corresponding to about 5 to 15 minutes' transport time from their place of residence to the nature area. They used less than one hour including time for transportation per week volunteering.

The descriptive analysis shows a mutual tendency across organisations, revealing a general concern and interest in nature and involvement in their organisation among members including an concern for being able to provide the next generations with a nature of high quality (87%). Two third of the members (63%) felt it was important to protect and improve nature. Further, sharing knowledge was highly valued by members (61%), and about 72% experienced, that being a member contributed to the local community. Seventy five percent were part of the organisation because they enjoyed spending time outdoors but only one third considered meat and/or wool as their primary reason for membership. Almost all members (97%) though that their experiences in the organisation had been personally enriching. Apart from the alignment with their expectations of being a member, agreement with the organisation's values is important for continued membership. Especially values supporting animal welfare were strongly shared by members (90%) whereas connect to the social values were the least important.

The point of entrance to the organisations were typically personal invitation by friends or family and only about 13% learned about the organisation through social or other medias and 17% had no prior association with the organisation before joining. When asked about the need of organizing the grazing organisation more than half did not answer the question, and among members who responded the opinion were mixed. The main reasons for not wanting a union were the concern that organisations were too diverse and resentment towards more bureaucracy. Members positive towards a union stressed collaboration, knowledge and experience sharing among the primary reasons.

4.2. Members' motivation

Initially, the factorability of the 22 motivation questions (items) were examined. The Kaiser-Meyer-Olkin measure of sampling adequacy (0.82) and Bartlett's test of sphericity ($X^2 = 1877.9$, $df = 231$, $p < 0.05$), both indicated good factorability supporting the explanatory power of the explanatory factors. Following the test of factorability the EFA (Exploratory Factor Analysis) confirmed that the items in the questionnaire could be grouped into nine factors ($p = 0.19$) of which 4 were excluded due to a low number of explanatory items (< 3) and low loadings (< 0.30), making them unqualified to be

considered factors (Field, 2009; Costello and Osbourn 2005). However, if an item had a strong theoretical fit, it was kept despite low loadings.

The five remaining factors related to 18 of the 22 items and were termed according to the items that described them (Table 3).

Table 3. Results from the exploratory factor analysis (EFA).

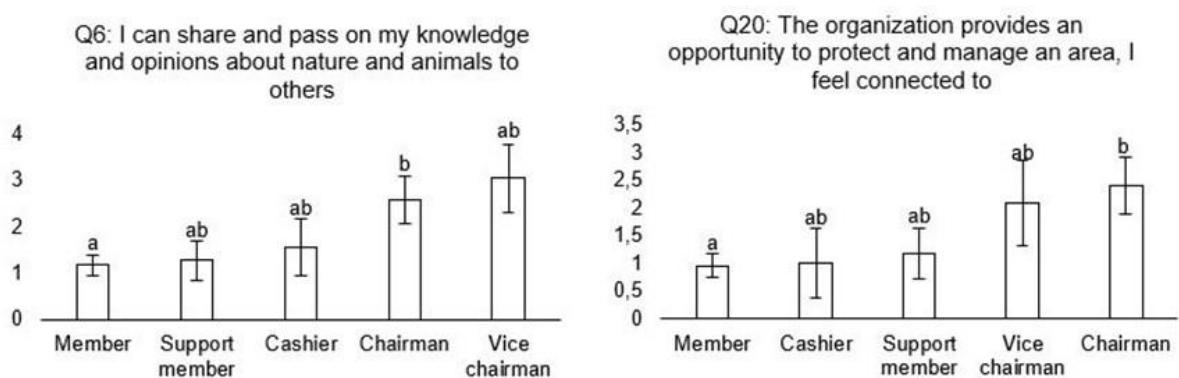
Factors	Loadings	Mean	SD
<i>Social</i>		3.05	1.02
Q8: The organisation is, for me, a way to meet new people	0.71		
Q9: The organisations social arrangements are important to me	0.75		
Q15: I am a member of the organisation, to associate/be with others	0.8		
<i>Personal benefit</i>		3.75	0.88
Q4: Participating in the grazing organisation gives me a new perspective on things	0.38		
Q6: I can share and pass on my knowledge and opinions about nature and animals	0.55		
Q7: By being a member of the organisation I can pass something on to other people	0.73		
Q10: I find that, in the organisation, we contribute to the local community	0.37		
Q11: Through the organisation, I have been able to make a difference	0.56		
<i>Nature value</i>		3.59	1.43
Q1: I am concerned about the loss of nature and biodiversity in Denmark	0.84		
Q2: I feel it is important to take care of / protect/improve nature	0.44		
Q5: I feel we today do enough to protect nature	-0.31		
<i>Identification</i>		3.73	0.99
Q12: People in close to me support my decision to be a member of a grazing organisation	0.31		
Q18: I expect to be a member of the organisation, for at least the next 5 years	0.45		
Q19: I consider joining another organisation within the next 5 years	0.32		
Q21: My experiences with the organisation are personally enriching	0.50		
<i>Instrumental</i>		3.22	1.06
Q14: I am a member of the organisation primarily for the meat and /or wool of the animals	0.56		
Q17: I am a member of the organisation because it provides good stories to tell family, friends and acquaintances	0.38		
Q22: The opinions, of people in my circle, are important to me	0.28		

The first factor is the *Social factor*, as all its explaining items concerned with meeting or associating with other people. The second factor is the *Personal benefit factor*, as relates to items all revolved around membership benefits. The third factor is the *Nature value factor*, relating to items describing

the concern for degradation of nature and the will to conserve it. The fourth factor is the *Identification factor*, encompassing items describing connectivity (or place attachment) to the group of volunteers and the local community. The last is the *Instrumental factor* representing the items connected with obtaining rewards, through meat, wool, storytelling, or social recognition.

Besides the motivational factors, the location of the area subject for the voluntary engagement relative to the place of residence, and thus the time spent on transportation when doing the voluntary work, show to have strong impact on the motivation. Transportation time is an indicator of a cost-benefit mentality, which characterises the modern person's lifestyle where time is equally important as money. People who spent the least time on transportation and had the strongest connection to the local community found that the organisation contributed to the local community (Fig. 2).

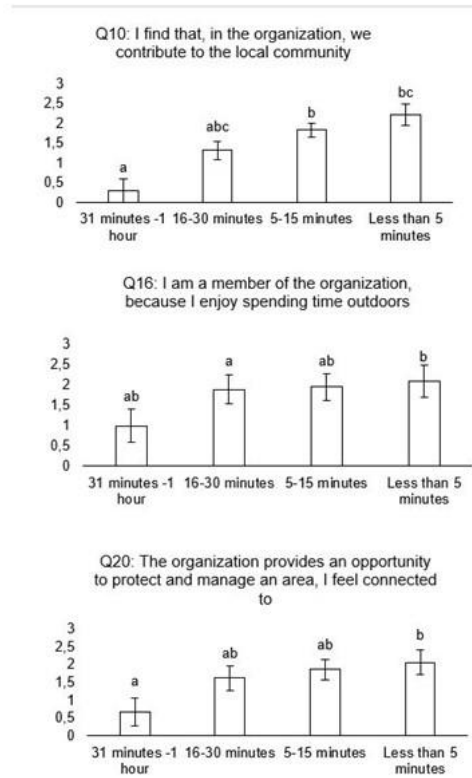
Fig. 2. The likelihood of agreement with the motivation statements between members with different membership status.



These members were typically local residents living in the vicinity of the grazing area, which is why they would be most likely to hear about or notice any positive feedback. People living close to the area also expressed high place attachment, which suggests that people get more joy and are more willing to volunteer in their local community due to the first-hand experiences and feedback they receive about the effect of their efforts. The members who spent more time on transportation were less likely to consider the enjoyment of outdoor activities as a primary reason for membership. Similar results were found by The Danish Economic Councils (2014), showing that people who visit recreational areas mostly travel one to three kilometres from their homes. This emphasises the importance of local nature in enjoyment, active involvement and use.

Last, the scope of the conservation is closely connected to the commitment of the volunteers leading the organisations (Fig. 3). We find that members who volunteer for the board and/or are elected by the other members, distinguishes them significantly from commercial initiatives. The individuals who volunteered for the position of chairperson expressed higher place attachment/connection to the managed areas and felt they could pass on and share their knowledge about nature and animals with the members of their organisation.

Fig. 3. The likelihood of agreement with motivations statements between members with different transportation time.



1.3. Inter organisational differences

After having identified the five motivational factors a Kruskal Wallis tests and ordinal ANOVA and regressions for the CLM (Cumulative Link Models) were performed to investigate the differences in the members' motivation between organisations (Table 4). For the tests showing a significant difference ($p < 0.05$) a post hoc tests were performed to determine where the differences or correlations were.

Table 4. Result from the post hoc test for the Kruskal Wallis tests and ordinal ANOVA and regressions for the CLM (Cumulative Link Model). The different letters in Group indicates significant difference between the groups.

Social			
Q8: The organisation is, for me, a way to meet new people			
Organisation	mean	SE	Group
Soellerod nature conservation- & grazing organisation (SOR)	1.74	0.79	a
Saerlose grassland forest boar and grazing organisation (SG)	5.35	0.87	c
Age	mean	SE	Group
21-30	1.43	0.75	a
31-40	2.16	0.62	ab
41-50	2.51	0.62	abc
51-60	2.94	0.6	abc
Older than 81	3.48	1.17	abc
61-70	3.69	0.64	c
71-80	3.96	0.78	bc
16-20	6.5	1.61	bc
Q9: The organisations social arrangements are important to me			
Organisation	mean	SE	Group
Soellerod grazing organisation (SOR)	0.1	0.7	a
Saerlose grassland forest boar and grazing organisation (SG)	3.43	0.77	cd
Q15: I am member of the organisation, to associate/be with others			
Organisation	mean	SE	Group
Soellerod nature conservation- & grazing organisation (SOR)	0.52	0.67	a
Saerlose grassland forest boar and grazing organisation (SG)	4.87	0.79	c
Gender	mean	SE	Group
Female	1.91	0.45	a
Male	2.37	0.45	b
Personal benefit			
Q6: I can share and pass on my knowledge and opinions about nature and animals			
Membership status	mean	SE	Group
Member	1.17	0.22	a

Chairman	2.59	0.52	b
Q10: I find that, in the organisation, we contribute to the local community			
Transportation	mean	SE.	Group
31 minutes -1 hour	0.3	0.3	a
More than 1 hour	0.94	0.85	abc
16-30 minutes	1.32	0.23	b
5-15 minutes	1.83	0.18	bc
Less than 5 minutes	2.23	0.27	c
Q11: Through the organisation, I have been able to make a difference			
Education	mean	SE	Group
Short higher education	0.81	0.45	a
Skilled	2.33	0.36	b
Nature Value			
Q2: I feel it is important to take care of / protect / improve nature			
Gender	mean	SE	Group
Male	2.18	0.27	a
Female	2.69	0.3	b
Education	mean	SE	Group
Short higher education	1.52	0.41	a
Skilled	2.32	0.33	ab
Long higher education	2.59	0.26	ab
Unskilled	2.72	0.72	ab
Intermediate higher education	3.03	0.29	b
Q5: I feel we today do enough to protect nature			
Gender	mean	SE	Group
Female	-0.86	0.38	a
Male	-0.41	0.37	b
Upbringing	mean	SE	Group
In the city	-0.78	0.36	a
In the countryside	-0.01	0.37	b
Identifikation			
Q21: My experiences with the organisation are personally enriching			
Organisation	mean	SE	Group
Soellerod grazing organisation (SOR)	-0.01	0.58	a
Hjortespring nature conservation association (HS)	2.4	0.46	b
Soroe grazing organisation (SR)	2.7	0.54	b
Q12: People in close to me support my decision to be a member of a grazing organisation			

Gender	mean	SE	Group
Male	1.23	0.24	a
Female	1.75	0.27	b
Membership status	mean	SE	Group
Support member	0.19	0.43	a
Chairman	1	0.43	ab
Member	1.28	0.14	ab
Cashier	2.27	0.6	b
Vice chairman	2.71	0.68	B

Instrumental

Q14: I am member of the organisation primarily for the meat and /or wool of the animals

Age	mean	SE	Group
Older than 81	-0.96	0.98	ab
16-20	-0.72	1.3	ab
71-80	-0.23	0.38	a
61-70	0.84	0.34	b
51-60	0.89	0.34	b
41-50	1.02	0.36	b
21-30	1.08	0.61	ab
31-40	1.55	0.41	b
Membership status	mean	SE	Group
Support member	-1.11	0.50	a
Vice chairman	0.28	0.74	ab
Chairman	0.29	0.49	ab
Cashier	1.26	0.59	b
Member	1.44	0.26	b
Education	mean	SE	Group
Long higher education	-0.57	0.34	a
Short higher education	0.95	0.49	b

With respect to *the social factor* significant differences were found between the organisations, as the members of Saerloose grassland forest boar and grazing organisation were three times as motivated by associating with other persons compared to members of Soellerod nature conservation- & grazing organisation. Demographics also influenced the members' motivation of the social factor. The oldest and the youngest members mostly saw the organisation as an opportunity to meet new people. Males

were more likely to associate with others than females and independently of gender the members' interest for social association almost increased with age

The *personal benefit* factor did not show strong differences between organisations, and neither did the demographic variables influence all aspects of the personal benefit factor. However, the time spent in the enclosure activities influenced members feeling of passing something on to others. The Chairpersons of the organisations found sharing knowledge about nature and animals about twice as important as regular members. The time spent on transportation to the enclosure were correlated with affected the members' view on their organisation's contribution the local community as members living close to the enclosure were more likely to agree that they contributed to the local community. Members level of education also affected their view on whether they were members of an organisation who made a difference, as skilled members were twice as likely to feel they made a difference compared to members with a short education.

The nature value factor did not show significant differences depending on the organisation whereas demographics and the nature factor interacted clearly. Thus, females were more likely to think it was important to protect nature than males. Even though, all generally agreed with the importance of nature protection and disagreed that enough effort was put into nature protection, members brought up in the city were more likely to express that not enough effort were put into nature protection, especially compared to members brought up in the countryside. Besides gender, members educational level also affected their preference for protecting and improving nature as members with an intermediate and higher education shared this position most strongly.

Members of the different organisations found different motivation attached to *the identification factor*. Thus, members of the organisations attaching the most importance to this factor were more than four times as likely express that their experiences had been enriching compared to members of attaching the least importance to this factor. Females were more likely to think that other people supported their decision of being part of the organisation than males and active members, e.g. the chairpersons, were also more likely to believe their decision was supported by others.

The production of meat and/or wool represented by *the instrumental factor* seemed to be a key factor for most of the organisations except for one outlier. Members' age, membership status, educational level and the time used per week all influenced their motivation connected to the instrumental factor as the oldest and youngest members expressed the least interest in the production of wool and meat.

The members putting the most effort into the organisation showed a strong motivation for meat and wool production, with the expectance of the chairmen. Members with a short education were three times as likely to see meat and/or wool as the primary reason for membership compared to members with a higher education.

5. Discussion and conclusion

In a European perspective, citizens have increasingly become engaged in associations that carry out practical nature conservation such as tree and woodland management (Natural England, 2014), establishing and supervising grazing activities, or conserving existing and degrading habitats (O'Brien et al., 2010). However, in Denmark nature management and protection mainly is funded and practised by the State, Municipalities and the Danish Nature Agency. Therefore, there is not a long standing tradition to involve volunteers in nature management and conservation. Furthermore, many areas in Denmark with high biodiversity are small and fragmented (Fløjgaard, Bladt & Ejrnæs, 2017), and therefore suitable management on a commercial basis in terms of e.g. extensive livestock grazing are typically connected with high costs (Schou et al., 2018).

In recent years voluntary nature management and conservation initiatives have increased in Denmark and is considered to have great potential for contributing to the improvement of natural habitats and biodiversity. The current study contributes to the existing literature on volunteering and practical nature conservation initiatives by exploring the motivation of voluntary nature managers outside the scope of stewardships in a Danish context.

Prior studies of environmental volunteers have revealed that concern for nature is a major motivation (Schroeder, 2000; Selinske et al., 2014), but also the opportunity to learn, socialise, reflect, belong to a community or get career benefits. This is supported by several studies that have identified the following three main categories of motivational factors among environmental volunteers: 1) Nature enjoyment or concern; 2) Social motivation, through social activities or expansion of network, and; 3) learning motivation (Bruyere and Rappe, 2007; Ryan et al., 2001; Schroeder, 2000; Selinske et al., 2014). These three categories of motivational factors are also captured in the current study by the nature value factor, the social factor and partly the personal benefit factor (which also included reflection and teaching motivations). This reveals that volunteers in citizen-driven organisations share three dominant motivations with other environmental volunteers and volunteers who are part of larger volunteer programmes.

This study also revealed motivational factors that distinguish, at least partly, this group of environmental volunteers from others. Prior studies have shown environmental volunteers to be motivated by working and or belonging to a well-organised project, where time is spent efficiently (Ryan et al., 2001). This is partly confirmed in this study where the identification factor revealed that members who shared a expectations of long-term commitment (five years) to the project also stated strong attachment to their ‘own’ project. The voluntary or democratically elected chairpersons expressed the greatest place attachment and a strong agreement with the ideals of sharing and passing on knowledge, which establishes a strong basis for the organisations to continue into the future.

However volunteers were reluctant to support the idea of forming a more formal setup in terms of a “Grazing organisation union”. Furthermore, the identification factor included several elements of *social norm* and *enhancement* (Clary et al., 1998) and members stated the importance of receiving support from people in their close circle and personally enriching experiences.

The identification factor adds a new perspective to volunteer motivation, as commitment and enriching experiences load the highest, which suggests that wanting to be a part of not only environmental voluntary initiatives, but potentially also other voluntary work is connected to obtaining enriching experiences. The instrumental factor included elements of *enhancement* (Clay et. al. 1998). Volunteers basically volunteered for themselves and often expressed they participated for personal development. Volunteers may be motivated by an opportunity to gain something, e.g. knowledge or skills (Dolnicar and Randle, 2007; Hibbert et al., 2006). Volunteering may also come from purely selfish reasons. Participating with other environmental volunteers reduces emotional discomfort from feeling guilt toward human impact on the environment or it may seen as a way to improve career goals (Bruyere and Rappe, 2007; Clary et al., 1998; Principi et al., 2016). However, here it was more closely connected to gaining a reward, e.g. receiving meat or wool from the animals. This is backed up by the result that 84.5% of the members expected a tangible outcome of their membership efforts. This contributes to the ongoing debate that volunteers are motivated by tangible outcomes (Alender, 2016; Jacobson et al., 2012; Schroeder, 2000; The third sector, 2009).

Results show that the level of education is the most consistent predictor of volunteering. This is in accordance with prior studies showing that the higher a volunteer’s level of education, the more likely they are to volunteer’, due to a larger network, and therefore a greater likelihood of being encouraged to volunteer (Measham and Barnett, 2008; Wilson, 2000), and because well-educated people are more likely to be aware of problems that need attention. High levels of education are also found to be

associated with volunteering for altruistic reasons, but also to reduce negative feelings, such as guilt and loneliness (Principi et al., 2016).

We also find, that the scope of the conservation is closely connected to the commitment of the volunteers leading the organisations as members who volunteer for the board and/or are elected by the other members, distinguishes them significantly from commercial initiatives and expressed higher place attachment. Thus, our results supplement observations by Jacobson et al. (2012) that found that the effort in volunteering was negatively correlated with the advancement of career goals, but positively correlated with the expected environmental outcome.

This study adds a new perspective to the understanding of motivation among environmental volunteers in the context of citizen-based nature management on private and public land. The results point to the need for further studies to explore the benefits that motivate volunteers, and how these can support municipalities, NGOs and others working with nature conservation and the communication of nature values. Three issues are of specific interest. Firstly, studies should explore on how to recruit future volunteers, and how to maintain the motivation of those who are already involved. Secondly, research needs to document the effect on biodiversity of the work performed by volunteers compared to professional managers/farmers. Third, the question how voluntary organisations can contribute to larger nature initiatives driven by municipalities or other public authorities needs to be explored further to support the anchorage of voluntary organisations in nature conservation policies.

Conflict of interest

Nothing to declare.

Acknowledgements

The authors would like to express their gratitude to the Danish Botanical Organisation and the Botanical Travel Fund/M.P. Christiansen and his wife for partly funding the data collection. The authors would also like to thank Anna Bodil Hald, Nick Leyssac, Jette Bredahl Jacobsen, and Gosha Sylvester, and the volunteers of the grazing organisations who participated in this study. Niels Strange acknowledges the Danish National Research Foundation for funding the Center for Macroecology, Evolution and Climate (grant number DNRF96).

Authors Contributions

S.F.M, N.S., & J.S.S. conceived the ideas and designed the methodology, S.F.M. collected and analysed the data. All authors led on the writing of the manuscript and contributed critically to the drafts and gave final approval for publication.

Consent, Information of Respondents, and Data collection

The study presents the key findings from a Master Thesis at the University of Copenhagen (Madsen 2018). Following the university guidelines data collected as part of a Master Thesis need not the approval of university ethics committee and thus, approval for social sciences is not required. However, the outline of the Master Thesis have been approved by the Teaching Committee and informed consent were obtained from the respondents, and full anonymity of the respondents were secured.

Questionnaire data were collected between 28 of November 2017 and 14. of January 2018. Follow up were sent to all organizations after two weeks. After further two weeks the data collection was initially planned to end, by inactivating the questionnaire link. Due to the Christmas holiday, and two organizations missing in the sample the data collection period was extended with approx. two weeks

The questionnaires were only distributed to persons over the age of 18, and in accordance to the Danish Privacy Act.

Data Accessibility

Data will be available on https://ifro.ku.dk/publikationer/ifro_serier/dokumentation/

References

- Adhikari, B., Williams, F., Lovett, J.C., 2007. Local Benefits from Community Forests in the Middle Hills of Nepal. *Forest Policy Econ.* 9, 464–478.
- Alender, B., 2016. Understanding volunteer motivations to participate in citizen science projects: A Deeper look at water quality monitoring. *J. Sci. Commun.* 15, 1–19.
- Appiah-Opoku, S., 2007. Indigenous Beliefs and Environmental Stewardship: A Rural Ghana Experience. *J. Cult. Geogr.* 24, 79–98. <https://doi.org/10.1080/08873630709478212>.
- Asah, S.T., Blahna, D.J., 2012. Motivational functionalism and urban conservation stewardship:

implications for volunteer involvement. *Conserv. Lett.* 5, 470–477.
<https://doi.org/10.1111/j.1755-263X.2012.00263.x>

- Asah, S.T., Lenentine, M.M., Blahna, D.J., 2014. Benefits of urban landscape eco-volunteerism: Mixed methods segmentation analysis and implications for volunteer retention. *Landscape Urban Plan.* 123, 108–113. <https://doi.org/10.1016/J.LANDURBPLAN.2013.12.011>
- Bennett, N.J., Whitty, T.S., Finkbeiner, E., Pittman, J., Bassett, H., Gelcich, S., Allison, E.H., 2018. Environmental Stewardship: A Conceptual Review and Analytical Framework. *Environ. Manage.* 61, 597–614. <https://doi.org/10.1007/s00267-017-0993-2>
- Bramston, P., Pretty, G., Zammit, C., 2010. Assessing Environmental Stewardship Motivation. *Environ. Behav.* 43, 776–788. <https://doi.org/10.1177/0013916510382875>
- Bruyere, B., Rappe, S., 2007. Identifying the motivations of environmental volunteers. *J. Environ. Plan. Man.* 50, 503–516. <https://doi.org/10.1080/09640560701402034>
- Bussell, H., Forbes, D., 2002. Understanding the volunteer market : The what , where , who and why of volunteering ’, *International Journal of Nonprofit and. Int. J. Nonprofit Volunt. Sect. Mark.* 7, 244–257.
- Ceballos G, Ehrlich , P.R., Barnosky ,A.D., García A., Pringle R.M., Palmer,T.M. 2015). Accelerated modern human–induced species losses: Entering the sixth mass extinction. *Sci Adv* 1 (5), e1400253. DOI: 10.1126/sciadv.1400253.
- Center for frivilligt socialt arbejde, 2017. Fakta og tal om danskernes frivillige arbejde. URL <https://frivillighed.dk/guides/fakta-og-tal-om-danskernes-frivillige-arbejde> (accessed 12.5.17).
- Chacon, F., Perez, T., Flores, J., Luisa Vecina, M., 2011. Motives for volunteering: Categorization of volunteers’ motivations using open-ended questions. *Psychol. Spain* 15, 48–56.
- Choi, L.H., 2003. Factors Affecting Volunteerism among Older Adults. *J. Appl. Gerontol.* 22, 179–196. <https://doi.org/10.1177/0733464803022002001>
- Christensen, R.H.B., 2018. Ordinal-Regression Models for Ordinal Data.
- Christensen, R.H.B., 2011. Analysis of ordinal data with cumulative link models-estimation with the ordinal package. R-package version August, 1–31.
- Clary, E.G., Snyder, M., Ridge, R.D., Copeland, J., Stukas, A.A., Haugen, J., Miene, P., 1998. Understanding and assessing the motivations of volunteers: a functional approach. *J. Pers. Soc. Psychol.* 74, 1516–1530.
- Costello, A.B., Osborne, J.W., 2005. Best Practices in Exploratory Factor Analysis : Four Recommendations for Getting the Most From Your Analysis. *Pract. Assessment, Res. Educ.* 10, 1–9. <https://doi.org/10.1.1.110.9154>
- Davila, M.C., Díaz-Morales, J.F., 2009. Age and motives for volunteering: Further evidence. *Eur. J. Psychol.* 5, 82–95. <https://doi.org/10.5964/ejop.v5i2.268>
- Dolnicar, S., Randle, M., 2007. What Motivates Which Volunteers? Psychographic Heterogeneity

- Among Volunteers in Australia. *Volunt. Int. J. Volunt. Nonprofit Organ.* 18, 135–155. <https://doi.org/10.1007/s11266-007-9037-5>
- Einolf, C., Chambré, S.M., 2011. Who volunteers? Constructing a hybrid theory. *Int. J. Nonprofit Volunt. Sect. Mark.* 16, 298–310. <https://doi.org/10.1002/nvsm.429>
- Erikson, E.H., 1964. *Insight and resposibilites*. W. W. Norton, New York, NY, USA.
- Erlinghagen, M., Email, G., Hank, K., 2005. Participation of Older Europeans in Volunteer Work. *Ageing Soc.* 26, 567–84.
- Fabricius, M.K., 2006. *Social kapital & frivilligt arbejde i dansk naturpleje*.
- Field, A. (2009). *Discovering Statistics using SPSS*. Sage: London.
- Fløjgaard, C., Bladt, J., Ejrnæs, R. 2017. *Naturpleje og arealstørrelser med særligt fokus på Natura 2000 områderne*. Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi, 58 s. - Videnskabelig rapport fra DCE - Nationalt Center for Miljø og Energi nr. 228. <http://dce2.au.dk/pub/SR228.pdf>.
- Guiney, M.S., Oberhauser, K.S., 2009. Conservation Volunteers' Connection to Nature. *Ecopsychology* 1, 187–197. <https://doi.org/10.1089/eco.2009.0030>
- Henderson, A.E., Reed, M., Davis, S.K., 2014. Voluntary Stewardship and the Canadian Species at Risk Act: Exploring Rancher Willingness to Support Species at Risk in the Canadian Prairies. *Hum. Dimens. Wildl.* 19, 17–32. <https://doi.org/10.1080/10871209.2013.819595>
- Hibbert, S., Piacentini, M., Dajani, H. Al, 2006. Understanding volunteer motivation for participation in a community-based food cooperative. *Int. J. Nonprofit Volunt. Sect. Mark.* 8, 30–42. <https://doi.org/10.1002/nvsm.199>
- Hjortsø, C.N., Busck, A.G., Fabricius, M.K., 2006. *Frivilligt arbejde i dansk naturforvaltning, By- og Landsplanserien*. Center for Skov, Landskab og Forvaltning.
- Hustinx, L., Cnaan, R.A., Handy, F., 2010. Navigating Theories of Volunteering: A Hybrid Map for a Complex Phenomenon. *J. Theory Soc. Behav.* 40, 410–434. <https://doi.org/10.1111/j.1468-5914.2010.00439.x>
- Jacobson, S.K., Carlton, J.S., Monroe, M.C., 2012. Motivation and Satisfaction of Volunteers at a Florida Natural Resource Agency. *J. Park Recreat. Admi.* 30, 51–67J. <https://doi.org/10.1029/2009GC002450>
- Knowles, M., 1972. Motivation in Volunteerism: Synopsis of a Theory. *J. Volunt. Action Res.* 1, 27–29. <https://doi.org/10.1177/089976407200100205>
- Kreutzwiser, R., de Loë, R., Imgrund, K., Conboy, M.J., Simpson, H., Plummer, R., 2011. Understanding stewardship behaviour: factors facilitating and constraining private water well stewardship. *J. Environ. Manage.* 92, 1104—1114. <https://doi.org/10.1016/j.jenvman.2010.11.017>
- Kuempel, C.D., Adams, V.M., Possingham, H.P., Bode, M., 2018. Bigger or better: The relative

benefits of protected area network expansion and enforcement for the conservation of an exploited species. *Conserv. Lett.* 11, 1–8. <https://doi.org/10.1111/conl.12433>

Larese-casanova, M., Hill, O.M., 2018. Engaging people in nature stewardship through Master Naturalist programs 12, 259–271.

Le Saout, S., Hoffmann, M., Shi, Y., Hughes, A., Bernard, C., Brooks, T.M., Bertzky, B., Butchart, S.H.M., Stuart, S.N., Badman, T., Rodrigues, A.S.L., 2013. Protected Areas and Effective Biodiversity Conservation. *Science* (80-.). 342, 803–805.

Lenth, R., Singmann, H., Love, J., Buerkner, P., Herve, M., 2018. emmeans: Estimated Marginal Means, aka Least-Squares Means.

Liarakou, G., Kostelou, E., Gavrilakis, C., 2011. Environmental volunteers: factors influencing their involvement in environmental action. *Environ. Educ. Res.* 17, 651–673. <https://doi.org/10.1080/13504622.2011.572159>

Littlepage, L., Obergfell, E., Zanin, G., 2003. Family Volunteering : An Exploratory Study of the Impact on Families.

Madsen, S. F. 2018. What motivates nature volunteers and how is the nature status on the areas they manage - A case study of Danish grazing organizations and open natural habitats. Master Thesis, University of Copenhagen, Department of Food and Resource Economics and Department of Biology.

Measham, T.G., Barnett, G.B., 2008. Environmental Volunteering: motivations, modes and outcomes. *Aust. Geogr.* 39, 537–552. <https://doi.org/10.1080/00049180802419237>

Messier, C., Puettmann, K., Chazdon, R., Andersson, K.P., Angers, V.A., Brotons, L., Filotas, E., Tittler, R., Parrott, L., Levin, S.A., 2014. From Management to Stewardship: Viewing Forests As Complex Adaptive Systems in an Uncertain World. *Conserv. Lett.* 8, 368–377. <https://doi.org/10.1111/conl.12156>

Natural England, 2014. Access to Nature : inspiring people to engage with their natural environment.

O'Brien, L., Townsend, M., Ebdon, M., 2010. 'Doing Something Positive': Volunteers' Experiences of the Well-Being Benefits Derived from Practical Conservation Activities in Nature. *Volunt. Int. J. Volunt. Nonprofit Organ.* 21, 525–545. <https://doi.org/10.1007/s11266-010-9149-1>

Omoto, A.M., Packard, C.D., 2016. The power of connections: Psychological sense of community as a predictor of volunteerism. *J. Soc. Psychol.* 156, 272–290. <https://doi.org/10.1080/00224545.2015.1105777>

Paloniemi, R., Hujala, T., Rantala, S., Harlio, A., Salomaa, A., Primmer, E., Pynnönen, S., Arponen, A., 2017. Integrating Social and Ecological Knowledge for Targeting Voluntary Biodiversity Conservation. *Conserv. Lett.* 11, e12340. <https://doi.org/10.1111/conl.12340>

Papadakis, K., Frater, J., 2004. Understanding volunteers' motivations. *Recreation* 321–326.

- Pino del Carpio, A., Sánchez S., Nieto, A., Bilz, M. 2013. European Redlist Denmark's biodiversity at risk A call for action. European Union Representative Office: Belgium.
- Principi, A., Schippers, J., Naegele, G., Di Rosa, M., Lamura, G., 2016. Understanding the link between older volunteers' resources and motivation to volunteer. *Educ. Gerontol.* 42, 144–158. <https://doi.org/10.1080/03601277.2015.1083391>
- R Core Team, 2017. R: A Language and Environment for Statistical Computing.
- Revelle, W., 2018. psych: Procedures for Psychological, Psychometric, and Personality Research.
- Rodriguez, S.L., Peterson, M.N., Cabbage, F.W., Sills, E.O., Bondell, H.D., 2012. Private landowner interest in market-based incentive programs for endangered species habitat conservation. *Wildl. Soc. Bull.* 36, 469–476. <https://doi.org/10.1002/wsb.159>
- Rode J., Wittmer H., Emerton L., Schröter-Schlaack ,C. 2016. 'Ecosystem service opportunities': A practice-oriented framework for identifying economic instruments to enhance biodiversity and human livelihoods. *Journal for Nature Conservation* 33:35–47.
- Rotman, D., Preece, J., Hammock, J., Procita, K., Hansen, D., Parr, C., Lewis, D., Jacobs, D., 2012. Dynamic Changes in Motivation in Collaborative Citizen-science Projects, in: *Proceedings of the ACM 2012 Conference on Computer Supported Cooperative Work, CSCW '12*. ACM, New York, NY, USA, pp. 217–226. <https://doi.org/10.1145/2145204.2145238>
- Ryan, R.L., Kaplan, R., Grese, R.E., 2001. Predicting volunteer commitment in environmental stewardship programmes. *J. Environ. Plan. Manag.* 44, 629–648. <https://doi.org/10.1080/09640560120079948>
- Sayre, N.F., McAllister, R.R.J., Bestelmeyer, B.T., Moritz, M., Turner, M.D., 2013. Earth Stewardship of rangelands: coping with ecological, economic, and political marginality. *Front. Ecol. Environ.* 11, 348–354. <https://doi.org/10.1890/120333>
- Schroeder, H., 2000. The restoration experience: volunteers' motives, values, and concept of nature. *Restoring Nat. Perspect. from Soc. Sci. Humanit.* 247–264. <https://doi.org/citeulike-article-id:2687810>.
- Schou, J.S. J. Bladt, R. Ejrnæs, C. Fløjgaard, M.N Thomsen, and S. Vedel. 2018. Towards more self-sustaining nature management: Economic consequences of establishing large natural areas. Abstract for the Second Nordic Annual Environmental and Resource Economics (NAERE) Workshop, 12-13 April 2018 in Bergen, Norway.
- Selinske, M.J., Coetzee, J., Purnell, K., Knight, A.T., 2014. Understanding the Motivations, Satisfaction, and Retention of Landowners in Private Land Conservation Programs. *Conserv. Lett.* 8, 282–289. <https://doi.org/10.1111/conl.12154>
- Sparks, S.D., 2018. Volunteering Rates Dropped Among Young Americans. *Educ. Week* 37, 12–13.
- Strzelecka, M., Nisbett, G.S., & Woosnam, K.M. (2017). The hedonic nature of conservation volunteer travel. *Tourism Management*, 63, 417-425.

- Strzelecka, M., Woosnam, K.M., & Nisbett, G. (in press). Self-efficacy mechanism at work: The context of environmental volunteer travel. *Journal of Sustainable Tourism*, <https://doi.org/10.1080/09669582.2018.1526297>.
- Svenning, J.-C., P. B. M. Pedersen, C. J. Donlan, R. Ejrnæs, S. Faurby, M. Galetti, D. M. Hansen, B. Sandel, C. J. Sandom, J. W. Terborgh & F. W. M. Vera. 2016. Science for a wilder Anthropocene: Synthesis and future directions for trophic rewilding research. *Proceedings of the National Academy of Sciences* 113(4): 898-906.
- Takase, Y., Hadi, A.A., Furuya, K., 2018. The Relationship Between Volunteer Motivations and Variation in Frequency of Participation in Conservation Activities. *Environ. Manage.* <https://doi.org/10.1007/s00267-018-1106-6>
- The Danish Economic Council, 2014. Kapitel VI: Værdi af rekreative områder, in: *Økonomi Og Miljø – Omkostninger Ved VE-Støtte, Ressourcestrategi, Invasive Arter, Rekreative Værdier, Kollektiv Trafik*. pp. 103–192.
- The Danish Ministry of Justice, 2017. Lov om behandling af personoplysninger . Lovtidende A. URL <https://www.retsinformation.dk/forms/r0710.aspx?id=828> (accessed 10.5.17).
- The Danish Society for Nature Conservation, 2017. Naturplejekortet . Proj. Campaign. - Nat. Manag.
- The Danish Society of Nature Conservation, 2006. Praktisk guide for kogræsserforeninger Danmarks Naturfredningsforening.
- The third sector, 2009. Volunteering: “It’s a marketing challenge” . third Sect. URL <https://www.thirdsector.co.uk/volunteering-its-marketing-challenge/volunteering/article/917957> (accessed 11.27.18).
- UK Civil Society Almanac, 2014. How many young people volunteer? . NCVO. URL <https://data.ncvo.org.uk/a/almanac14/how-many-young-people-volunteer/#footnote-ref-77a> (accessed 12.5.18).
- Vejle municipality, 2018. Kogræsserforeninger . Udvikl. med vilje. URL <https://www.vejle.dk/om-kommunen/udvikling-med-vilje/vi-udvikler-naturen/kograesserforeninger/> (accessed 11.29.18).
- Waldron, A., Mooers, A.O., Miller, D.C., Nibbelink, N., Redding, D., Kuhn, T.S., Roberts, J.T., Gittleman, J.L., 2013. Targeting global conservation funding to limit immediate biodiversity declines. *Proc. Natl. Acad. Sci.* 110, 12144–12148. <https://doi.org/10.1073/PNAS.1221370110>
- Waters, R.D., LeBlanc Feneley, K., 2013. Virtual stewardship in the age of new media: have nonprofit organizations’ moved beyond Web 1.0 strategies? *Int. J. Nonprofit Volunt. Sect. Mark.* 18, 216–230. <https://doi.org/10.1002/nvsm>
- Wilson, J., 2000. Volunteering. *Annu. Rev. Sociol.* 26, 215–240. <https://doi.org/10.1146/annurev.soc.26.1.215>
- Wymer, W.W., 1999. Understanding Volunteer Markets: The Case of Senior Volunteers. *J.*

Nonprofit Public Sect. Mark. 6, 1–23. https://doi.org/10.1300/J054v06n02_01.