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CONTESTED LANDS? DISSONANCE AND COMMON GROUND IN STAKEHOLDER VIEWS ON FOREST VALUES

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ABSTRACT

Forest lands are used in increasingly plural ways and serve society with numerous benefits. This paper analyses the views of private forest owners and the general public in Sweden on the values of the forest. Two main dimensions were identified: ‘preservation and recreation’ values, reflecting ecological and social aspects; and ‘production’ values, reflecting economic aspects. While the general public emphasised the importance of forest uses which cater to ecological and social forest values more strongly compared to the forest owners, no significant difference was found concerning economic forest values. This suggests that while there is scope for contestation over forest land use, there is also some potential for common ground across stakeholder groups. These findings add to the body of knowledge of the views on the use of forest lands, and can inform forest related planning, management and policy development.

Key words: forest values, land use, survey data, principal component analysis, regression analysis, Sweden

INTRODUCTION

Forests are natural environments as well as also economic, social and cultural landscapes and landscapes of protection (e.g. Slee 2005). They provide a habitat for plants and animals, and host essential natural processes (Groot *et al.* 2002). Forestry and its related industries maintain much of their economic importance despite economic restructuring towards the urban-oriented service and knowledge economy (Lundmark 2006; Sandström *et al.* 2011). Forests are also important in the maintenance of attractive living and leisure environments (Elands & Wiersum 2001), and provide societal benefits, for example, as venues for recreation (Eriksson *et al.* 2012).

Forests have a role in the production of private as well as public goods and services (Sandström *et al.* 2011), and the importance of

privately owned forest areas is not exclusive to the land owners.¹ The common law right of public access entails the right of the general public to use privately owned land for purposes of leisure, recreation and certain commercial activities such as berry picking and tourism (Sandell & Fredman 2010). Besides the land owners, other forest stakeholders include for instance NGOs for nature conservation; real estate or industrial developers; aboriginal reindeer herders; birdwatchers; hunters and tourism entrepreneurs.

There is a long history in Europe of competing claims and uses of forest lands (Niemelä *et al.* 2005), and recent trends towards rural diversification (Marsden 1998) and ‘post-productivism’ (Wilson 2001; Mather *et al.* 2006) have further increased and broadened the demands (Elands *et al.* 2004; Niemelä *et al.* 2005; Cubbage *et al.* 2007). Moreover, forecasts

for demographic and economic development into the future point to further increase in the demand for biological resources and thus intensified land use (Beland Lindahl & Westholm 2011). Forest land can become subject to contestation when the interests of different users call for diverging, and potentially incompatible, land use management strategies. For instance, recreational users, environmentalists and the paper industry might have rather different views on forest management (Cutter and Renwick 2004). However, stakeholders with divergent interests can co-exist without conflict if their respective needs are negotiated and recognised (Cutter and Renwick 2004). It merits mention that although downright conflicts tend to be destructive and costly (Redpath *et al.* 2013), lower-key disagreements may have positive connotations in terms of, for instance, the definition and awareness of problems and issues; the consideration of a plurality of voices and interests; the fostering of creative solutions (Hellström 2001); and people's emotional engagement with the environment (Buijs & Lawrence 2013).

This study aims to scrutinise the views of two stakeholder groups – private forest owners and the general public in Sweden – on the values of the forest for different areas of usage, and to explore how this may be interpreted against the background of individual characteristics and whether this implies diverging priorities across the groups.

LITERATURE REVIEW

Forest values as ecosystem services – Forest values, which can be defined as ‘conceptions of the “good” related to forests and forest ecosystems’ (Xu & Bengston 1997, p. 44) or aspects of ‘the relation between humans and the forest’ (Eriksson 2012, p. 1103), are multifaceted, and the forest is simultaneously valued in several dimensions (Xu & Bengston 1997). Some of the values are instrumental, that is, means for human-defined ends; while others are non-instrumental or intrinsic, namely, ends in themselves. Forest values include economic or utilitarian values and ecological life-support systems as well as aes-

thetic and ‘moral/spiritual’ values (Xu & Bengston 1997; Farber *et al.* 2002; MA 2003; Satz *et al.* 2013).

The ecosystem² services concept refers to ‘the benefits people obtain from ecosystems’ (MA 2003, p. 5) through their processes and functions (Groot *et al.* 2010). It is an anthropocentric concept emphasising human and societal gains from ecosystem functionality (Groot *et al.* 2002, cf. Farber *et al.* 2002; MA 2003; Summers *et al.* 2012) through either direct or indirect utilisation (Krieger 2001; Fisher *et al.* 2009). Forest ecosystems provide a multitude of goods and services, including foodstuffs, clean air and water, raw materials, and recreational opportunities and other services (Krieger 2001). Ecosystem services can be classified into ‘supporting’ services, referring to the ecological processes that are necessary preconditions for all other ecosystem services; ‘regulating’ services, the benefits (e.g. clean air and water) stemming from the regulation of ecosystem processes; ‘provisioning’ services, denoting products (food, fuel wood etc.) acquired from ecosystems; and ‘cultural’ services, referring to non-material benefits (recreation, education, cultural heritage, aesthetics, etc.). Ecosystem services are influenced by ‘drivers’ operating across different spatial and temporal scales. The indirect drivers include demographic, economic, political, technological and cultural change, whereas the direct drivers include, for example, land use change and natural processes. The indirect drivers, such as changes in people's values and consumption patterns, may also influence the direct drivers, in turn affecting ecosystems and the services they provide (MA 2003).³

Planning for sustainable (forest) land use – Virtually all forms of land use are prone to tension between the different priorities represented in the ‘planner's triangle’ (Campbell 1996). The aims of economic development (exploitation), ecological/environmental protection (conservation/preservation) and social concerns (e.g. the equitable distribution of resources) represent the overarching goals and visions of contemporary planning. They are also the constituents of the sustainability concept (Brundtland 1987), sometimes accompanied by

a notion of 'livability' (Godschalk 2004) or cultural sustainability (Rannikko 1999). Trade-offs are often required to achieve an appropriate balance between these potentially conflicting aims. Although they are of equal importance on a conceptual level, social and cultural aspects of sustainability have a tendency to lag behind the economic and ecological aspects in practice (Campbell 1996; Godschalk 2004; Axelsson *et al.* 2013). Moreover, dissonance may arise not only between but also within the dimensions of sustainability (Nalle *et al.* 2004).

Sustainability is a key goal in the current paradigm of forest management and policy, which acknowledges forests' multiple functions, outputs and management objectives (Uliczka *et al.* 2004; Cabbage *et al.* 2007) and thus the different values and needs associated with these lands. Different objectives and management strategies may produce rather different outcomes for land use and influence forest ecosystem services. Management emphasising multi-functional uses is often beneficial from economic, ecological, social and cultural points of view, in comparison to land use which accommodates fewer functions in converted, mono-functional landscapes (e.g. clear-cutting). This suggests that although trade-offs are often necessary, different agendas are not unavoidably at odds with each other (Groot 2006; Groot *et al.* 2010). Also, forest owners who take a multi-functional approach to forest management have been found to be more prone to provide not only private benefits but also public benefits (Urquhart & Courtney 2011). However, multi-functional land-use depends on spatial scale and level of aggregation inasmuch that mono-functional land use on for instance a sub-local scale (such as individually owned forest holdings) can amount to multi-functional land use on a local scale.

Views on the forest among the general public and forest owners – Value orientations vary along a continuum between anthropocentric (human-centred) and biocentric (nature-centred) values (Vaske *et al.* 2001), and may be associated with behaviour *vis-à-vis* the forest (Winter 2005; Eriksson 2012). Studies conducted in both Europe (including Sweden) and the US indicate that views on the values of

the forest have shifted over time from an emphasis on economic and production values towards an increasing emphasis on ecological and social values (Tarrant & Cordell 2002; Nordlund & Westin 2011; Eriksson *et al.* 2013) and non-commodity outputs from forestry (Elands & Praestholm 2008). A recent Swedish study showed that the general public emphasised multiple forest values, among which the most important were ecological, cultural and social (recreation) values, and with economic values (production) seen as the least important (Eriksson *et al.* 2013). A previous Finnish study showed that compared to forest owners, non-owners were more pronouncedly in favour of the conservation of forest land (Kangas & Niemeläinen 1996). In recent decades, forest activities have developed towards an increasing emphasis on recreational use (Hörnsten 2000).

Women, city dwellers and young people tend to stress ecological values more strongly than others (Kangas & Niemeläinen 1996; Dietz *et al.* 1998; Vaske *et al.* 2001; Tarrant & Cordell, 2002). This indicates, *inter alia*, that the advocates of conservation may primarily be those who live at a distance from the rural areas in question (Kangas & Niemeläinen 1996). Education, environmental knowledge, income and political orientation (McFarlane & Boxall 2000) are also pertinent aspects, with for instance the highly educated being more environmentally concerned than others (Dietz *et al.* 1998). Yet, socio-economic variables do not necessarily display a strong association with attitudes and values (McFarlane & Boxall 2000), and several factors, for example, income and occupation, have non-significant or inconsistent associations across studies (Dietz *et al.* 1998).

Current trends of change within the corps of forest owners include an increasing share of non-resident owners who live at a distance from their forest property; decreasing numbers of farmers; an increasing occurrence of joint ownership; increasing shares of female owners; and changes in the owners' age structure (Boon *et al.* 2004; Ingemarson *et al.* 2006; Nordlund & Westin 2011). 'Traditional' forest owners are accompanied by new groups of owners, who may have different reasons for entering forest ownership and approach it differently (Ingemarson *et al.* 2006; Urquhart & Courtney 2011). For instance, there are signs that 'hobby forest

owners', who prioritise elements of personal enjoyment in forest management and are not necessarily economically dependent on forest revenues, are becoming increasingly common (Urquhart & Courtney 2011). The objectives of forest owners are particularly likely to alter when forest ownership is passed on to a new generation of owners whose profiles, views, education and other characteristics differ from those of their precursors (Ingemarson *et al.* 2006; Nordlund & Westin 2011).

Private forest owners form a heterogeneous group (e.g. Boon *et al.* 2004; Wiersum *et al.* 2005; Ingemarson *et al.* 2006; Dhubbáin *et al.* 2007; Urquhart & Courtney, 2011; Urquhart *et al.* 2012). Swedish studies have shown that female forest owners tend to emphasise values other than economic revenue, including ecological and recreation values, to a higher extent than their male counterparts (Lidestav & Ekström 2000; Nordlund & Westin, 2011). In a Finnish study, owners living in urban environments have been found to emphasise recreational forest values to a larger extent than rural owners (Kangas & Niemeläinen 1996). Forest owners who emphasise conservation values tend to be younger, live in cities and be knowledgeable about conservation to a larger extent than other owners, as shown in studies of Swedish forest owners (Uliczka *et al.* 2004; Ingemarson *et al.* 2006). An English study has shown that owners anxious to protect their private property rights and those who emphasise conservation may express reluctance concerning public access to their woodlands (Urquhart *et al.* 2012). A study of Nordic forest owners also showed that since conservation usually implies restrictions in the use of forest resources and possible economic disadvantage for the owners, 'not in my backyard' (NIMBY) attitudes may appear (Bergseng & Vatn 2009). Also, the support of specific forest management practices varies; for instance, a Finnish study found that women and non-forest owners are often opposed to clear-cutting (Kangas & Niemeläinen 1996).

MATERIAL AND METHODS

The focus of the paper is on inter-group comparisons of forest owners and the general

public in Sweden, based on a pooled data set stemming from two postal questionnaire surveys conducted in November 2012–February 2013. Sampling,⁴ questionnaire testing, data collection and administration were managed by Statistics Sweden. The response rate after three waves of data collection was 60.1 per cent ($n = 1,258$) for the forest owners and 44.0 per cent ($n = 876$) for the general public. The sample of the general public was drawn among individuals aged 20–80 years. For the forest owners, the sampling frame consisted of those at least 20 years old and whose forest holdings amounted to at least five hectares. The sample of forest owners was stratified in order to ensure the inclusion of residential as well as non-residential forest owners (i.e. those living in the municipality where their forest property is located and those living in another municipality). The data are weighted in order to account for the stratification (i.e. restore the actual proportions of residential and non-residential forest owners in the population) and render the sample representative of the groups, while still maintaining the original number of observations in the sample. Information on sex, age, marital status, income, country of birth, municipality of residence and income was also added from official population registers. While the survey of the forests owners was more comprehensive than the one of the general public, certain questions were identical in both surveys to enable comparative analysis. This sub-set of data is the basis of the present paper.

The respondents' assessments of the importance of different uses of the forest were used as operational indicators of their views on forest values. The indicators were measured through the question 'How important do you consider the following uses of the forest to be', which contained the following items: 'protection of virgin forests/natural forests'; 'biofuel production'; 'timber production'; 'recreation'; 'tourism'; and 'preservation of plants and animals'. The rationale behind the selection of items was to capture different aspects and different types of qualities forests can be seen to possess; in other words, the multifaceted character of forest values. The items were measured on a seven-

point Likert-type scale ranging from one ('Not at all important') to seven ('Very important').

Sub-group comparisons through univariate descriptive analysis⁵ (Chi-square and analysis of variance) provided an initial picture of the associations between forest values and group affiliation. Then, exploratory principal component analysis (PCA) was employed to uncover underlying dimensions that guide the individual valuations of different forest uses, and interrelations between the items. The PCA produced two inductively grounded components, which were used in the subsequent analysis (cf. Haugen *et al.* 2008; Eriksson *et al.* 2012). The individual factor scores on these dimensions of forest values – 'preservation and recreation' and 'production' – were used as dependent variables in multivariate linear (ordinary least squares) regression models, thus replacing the original items and acting as representations of the latent dimensions of forest values. The independent variables⁶ (Table 1) encompassed demographic, socio-economic and geographical characteristics, and connections to forests and rural areas. Indicators of place attachment can interplay with environmental values (e.g. Kangas & Niemeläinen 1996; Lewicka 2011). It is also plausible that there are similar connections in regards to knowledge and experience (e.g. Duerden & Witt 2010) of forests and forestry.

Compared to the general public, the forest owners as a group were older, distinctly dominated by males and had a lower level of education. Forest owners also had higher average income, virtually all of them were native Swedes, and their past and previous residential patterns were more oriented towards rural geographies. They also had closer personal connections to forests and rural areas in terms of past and previous visits, knowledge and social relations.

RESULTS

Views on forest values – The views of the two groups differed significantly for all forest value items (Figure 1). On average, 'protection of virgin forests/natural forests', 'biofuel production', 'recreation', 'tourism' and 'preservation of plants and animals' were all

emphasised more strongly by the general public than by forest owners. The only forest value item that was stressed more heavily by the forest owners than by the general public was 'timber production'. The difference was most pronounced for 'tourism' and 'protection of virgin forests/natural forests', while the difference was smallest for 'timber production' and 'biofuel production'.

The exploratory principal component analysis rendered a solution (Table 2) with two latent dimensions which underlie the respondents' replies on the manifest forest value variable items. The dimensions accounted for 68.5 per cent of the variance. The first dimension had high variable loadings for 'protection of virgin forests/natural forests', 'preservation of plants and animals', 'recreation' and 'tourism'; that is, the importance of protection and conservation of natural environments and species paired with human uses of forest environments. Hence, ecological and social values were seen as related to each other and different from other (economic) values. This dimension can be interpreted as capturing forest values related to both non-instrumental (intrinsic) and instrumental aspects in terms of opportunities for leisure and recreation (including tourism⁷ activities) in forest environments. It also reflects ecological and social aspects of land use planning and sustainable forest management as well as supporting, regulating and cultural ecosystem services. Hence, the first dimension expresses an underlying dimension of the 'preservation and recreation' values of the forest. The second dimension had high variable loadings for 'timber production' and 'biofuel production' and a clear focus on an underlying dimension connected to the economic 'production' values of the forest. Thus, it was largely oriented towards instrumental forest values, the economic dimension of sustainability, and provisioning ecosystem services.

Regression analysis – Group affiliation was significant for 'preservation and recreation' values (Table 3), which were emphasised higher by the general public compared to the forest owners. However, this variable was not significant in the 'production' model (Table 4), the results of which can therefore

Table 1. *Sample descriptives.*

Variable	Variable levels (where applicable)	General public	Forest owners
*** Age (mean)		52.5	62.5
*** Gender (%)	Men	50.6%	68.0%
	Women	49.4%	32.0%
*** Education (%)	Low (primary/compulsory)	32.8%	46.9%
	Mid (secondary)	28.3%	20.1%
	High (tertiary)	38.9%	33.0%
*** Occupation (%)	Work	61.3%	52.4%
	Retiree	29.0%	46.2%
	Student	4.8%	0.2%
	Other	4.9%	1.2%
*** Income (mean), SEK		275,848	322,267
*** Marital status (%)	Married	51.1%	62.7%
	Other	48.9%	37.3%
*** Country of birth (%)	Sweden	87.9%	98.9%
	Abroad	12.1%	1.1%
*** Previous residential environment	Rural	36.3%	71.0%
	Small urban (pop. <50,000)	36.7%	20.0%
	Mid/large urban (pop. >50,000)	27.0%	9.1%
*** Current residential environment	Rural	25.9%	52.0%
	Small urban (pop. <50,000)	34.4%	30.4%
	Mid/large urban (pop. >50,000)	39.7%	17.5%
- Distance to nearest forest area, km (mean)		8.7	6.2
- Distance to most frequently visited forest area, km (mean)		19.8	23.6
*** Frequency of forest visits	Several times a week	21.3%	33.0%
	Sometime per week	25.0%	29.6%
	Sometime per month	25.2%	24.9%
	Sometime per year	21.8%	10.9%
	Seldom or never	6.8%	1.7%
*** Interest in forest issues (mean)		2.8	4.2
*** Knowledge of practical forestry (mean)		2.3	4.1
*** Knowledge of forest legislation (mean)		1.8	3.1
*** Family/friends who are forestry professionals	Yes	32.0%	62.6%
	No	68.0%	37.4%
*** Enjoys discussing forest issues	Yes	67.6%	72.1%
	No	32.4%	27.9%
*** Spends substantial amounts of leisure time in rural areas	Yes	33.7%	88.2%
	No	66.3%	11.8%
*** Family/friends who are forest owners	Yes	56.3%	93.9%
	No	43.7%	6.1%
*** Frequently visited the countryside during childhood	Yes	76.4%	85.7%
	No	23.6%	14.3%
*** Grew up on a farm	Yes	19.7%	55.3%
	No	80.3%	44.7%

Note: The variables *Interest in forest issues*, *Knowledge of practical forestry* and *Knowledge of forest legislation* were measured on a seven-point Likert-type scale ranging from one ('To a very small extent') to seven ('To a large extent').

*** $p < 0.001$, - $p > 0.05$

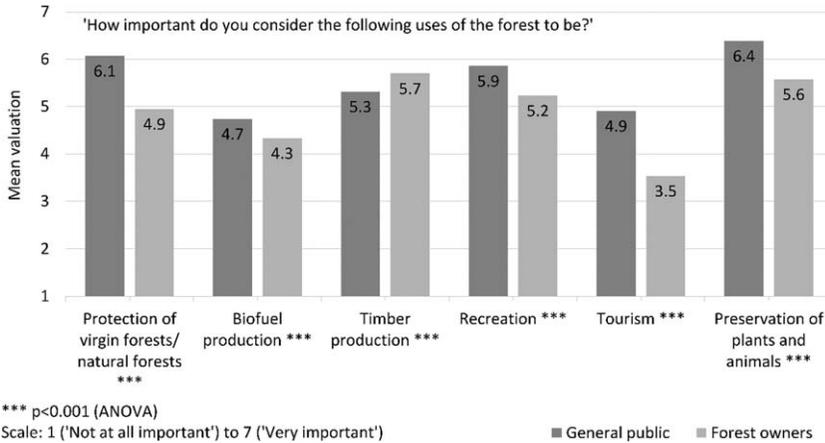


Figure 1. Views on forest values by group affiliation.

be interpreted as indicative that both groups had similar valuations of the importance of the economic uses of the forest and the associated values. If entered as the only independent variable, the group affiliation variable was significant in both models ($p < 0.001$ in the 'preservation and recreation' model and $p < 0.01$ in the 'production' model). However, when accompanied by other individual attributes, it was no longer significant for the 'Production' dimension. The remainder of the independent variables were included primarily to control for the effects of other individual attributes, and secondarily to assess how these additional factors interplay with forest values.

Concerning the demographic variables, gender was significantly associated with the

factor score for 'Preservation and recreation' forest values, which were emphasised more strongly by women than men. Gender was not significant in the 'Production' model, and age was not significant in either model. Among the socio-economic characteristics, education was significant only for 'Preservation and recreation', with the highly educated stressing these values the most. Income was somewhat positively associated with the factor score for 'Production'-related forest values, but non-significant for 'Preservation and recreation'. Main occupation and marital status were non-significant in both models. Most geographical characteristics of the respondents – their previous and current residential environments, and their self-reported distances to the nearest forest and

Table 2. Importance of different uses of the forest: factor loadings (Eigen values >0.5 are in italic).

	Rotated component matrix ^a	
	Component	
	'Preservation and recreation'	'Production'
Protection of virgin forests/natural forests	<i>0.86</i>	-0.01
Preservation of plants and animals	<i>0.84</i>	0.08
Recreation	<i>0.76</i>	0.25
Tourism	<i>0.67</i>	0.31
Timber production	0.02	<i>0.88</i>
Biofuel production	0.28	<i>0.79</i>

Notes: Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalisation.

^a Rotation converged in three iterations.

Table 3. *Parameter estimates: 'Preservation and recreation'.*

Dependent variable: Forest values factor score/Preservation and recreation ($r^2 = 18.5\%$)							
Parameter	B	Std. error	<i>t</i>	Sig.	95% Confidence interval		
					Lower bound	Upper bound	
Intercept	-0.047	0.257	-0.181	0.856	-0.552	0.458	
*** Group = general public	0.584	0.071	8.282	0.000	0.446	0.723	
Group = forest owners (ref)							
- Age	0.004	0.003	1.331	0.184	-0.002	0.009	
*** Gender = men	-0.328	0.059	-5.534	0.000	-0.445	-0.212	
Gender = women (ref)							
* Education = low	-0.172	0.070	-2.465	0.014	-0.308	-0.035	
Education = mid	-0.079	0.065	-1.218	0.223	-0.207	0.048	
Education = high (ref)							
- Occupation = work	-0.059	0.151	-0.391	0.696	-0.356	0.237	
Occupation = retiree	-0.222	0.164	-1.353	0.176	-0.544	0.100	
Occupation = student	-0.066	0.221	-0.301	0.764	-0.500	0.367	
Occupation = other (ref)							
- Income	0.000	0.000	-0.071	0.943	0.000	0.000	
- Marital status = married	-0.073	0.053	-1.386	0.166	-0.177	0.030	
Marital status = other (ref)							
- Country of birth = abroad	0.069	0.113	0.606	0.545	-0.153	0.290	
Country of birth = Sweden (ref)							
- Prev. residential = rural	0.029	0.087	0.329	0.742	-0.142	0.199	
Prev. residential = small urban	0.013	0.078	0.162	0.872	-0.140	0.165	
(pop. < 50,000)							
Prev. residential = mid/large urban							
(pop. > 50,000) (ref)							
- Current residential = rural	-0.109	0.075	-1.454	0.146	-0.256	0.038	
Current residential = small urban	-0.080	0.069	-1.152	0.250	-0.215	0.056	
(pop. < 50,000)							
Current residential = mid/large urban							
(pop. > 50,000) (ref)							
- Distance to forest	0.000	0.000	0.700	0.484	0.000	0.001	
- Distance to visited forest	0.000	0.000	-0.269	0.788	0.000	0.000	
- Frequency of forest visits	-0.046	0.026	-1.737	0.083	-0.097	0.006	
- Interest in forest issues	0.034	0.022	1.582	0.114	-0.008	0.077	
- Knowledge of practical forestry	-0.018	0.024	-0.752	0.452	-0.066	0.029	
* Knowledge of forest legislation	-0.056	0.028	-2.033	0.042	-0.111	-0.002	
* Family/friends forestry prof. = yes	-0.124	0.058	-2.131	0.033	-0.238	-0.010	
Family/friends forestry prof. = no (ref)							
* Enjoys discussing forest issues = yes	0.133	0.064	2.085	0.037	0.008	0.258	
Enjoys discussing forest issues = no (ref)							
* Leisure time in rural areas = yes	0.148	0.072	2.036	0.042	0.005	0.290	
Leisure time in rural areas = no (ref)							
- Family/friends forest owners = yes	0.041	0.074	0.557	0.578	-0.105	0.187	
Family/friends forest owners = no (ref)							
** Countryside during childhood = yes	0.226	0.080	2.825	0.005	0.069	0.383	
Countryside during childhood = no (ref)							
* Grew up on farm = yes	-0.154	0.070	-2.189	0.029	-0.291	-0.016	
Grew up on farm = no (ref)							

Note: - $p > 0.05$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4. *Parameter estimates: 'Production'.*

Dependent variable: Forest values factor score/Production ($r^2 = 11.4\%$)						
Parameter	B	Std. error	<i>t</i>	Sig.	95% Confidence interval	
					Lower bound	Upper bound
Intercept	-0.750	0.270	-2.780	0.006	-1.280	-0.221
- Group = general public	0.053	0.074	0.713	0.476	-0.092	0.198
Group = forest owners (ref)						
- Age	0.002	0.003	0.562	0.574	-0.004	0.007
- Gender = men	-0.049	0.062	-0.794	0.428	-0.171	0.073
Gender = women (ref)						
- Education = low	-0.056	0.073	-0.771	0.441	-0.199	0.087
Education = mid	-0.117	0.068	-1.719	0.086	-0.251	0.017
Education = high (ref)						
- Occupation = work	-0.012	0.158	-0.073	0.942	-0.322	0.299
Occupation = retiree	0.019	0.172	0.110	0.912	-0.318	0.356
Occupation = student	-0.344	0.232	-1.483	0.138	-0.798	0.111
Occupation = other (ref)						
* Income	0.000	0.000	2.021	0.043	0.000	0.000
- Marital status = married	0.048	0.055	0.872	0.383	-0.060	0.157
Marital status = other (ref)						
* Country of birth = abroad	-0.237	0.119	-2.002	0.045	-0.470	-0.005
Country of birth = Sweden (ref)						
- Prev. residential = rural	-0.017	0.091	-0.185	0.853	-0.196	0.162
Prev. residential = small urban	-0.009	0.082	-0.108	0.914	-0.169	0.151
(pop. < 50,000)						
Prev. residential = mid/large urban						
(pop. > 50,000) (ref)						
- Current residential = rural	0.120	0.079	1.528	0.127	-0.034	0.275
Current residential = small urban	0.161	0.072	2.228	0.026	0.019	0.304
(pop. < 50,000)						
Current residential = mid/large urban						
(pop. > 50,000) (ref)						
- Distance to forest	0.000	0.000	0.594	0.552	-0.001	0.001
- Distance to visited forest	0.000	0.000	-0.757	0.449	-0.001	0.000
- Frequency of forest visits	0.025	0.028	0.916	0.360	-0.029	0.079
- Interest in forest issues	0.043	0.023	1.868	0.062	-0.002	0.087
* Knowledge of practical forestry	0.052	0.025	2.062	0.039	0.003	0.102
- Knowledge of forest legislation	0.021	0.029	0.738	0.461	-0.036	0.079
*** Family/friends forestry prof. = yes	0.252	0.061	4.137	0.000	0.132	0.371
Family/friends forestry prof. = no (ref)						
** Enjoys discussing forest issues = yes	0.177	0.067	2.641	0.008	0.045	0.308
Enjoys discussing forest issues = no (ref)						
- Leisure time in rural areas = yes	-0.084	0.076	-1.102	0.271	-0.233	0.065
Leisure time in rural areas = no (ref)						
- Family/friends forest owners = yes	0.015	0.078	0.192	0.848	-0.138	0.168
Family/friends forest owners = no (ref)						
- Countryside during childhood = yes	-0.075	0.084	-0.898	0.369	-0.240	0.089
Countryside during childhood = no (ref)						
- Grew up on farm = yes	-0.023	0.074	-0.306	0.759	-0.167	0.122
Grew up on farm = no (ref)						

Note: - $p > 0.05$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

the forest they visited most often – were non-significant. Only country of birth was significant, and only in the ‘production’ model, where being born outside Sweden was associated with a lower emphasis on these forest values.

Several of the connections to forest and rural areas were significant in the analysis. However, the frequency⁸ with which the respondents visited the forest was not significant in either model, and neither was interest in forest issues. Knowledge of forest legislation was negatively associated with ‘preservation and recreation’ values, whereas knowledge of practical forestry (planting, thinning etc.) was positively associated with the ‘Production’ values. The presence of forestry professionals in the respondents’ social circuit of family or friends was divergently associated with the forest value dimensions: negatively in the case of ‘preservation and recreation’ and positively in the case of ‘production’. In contrast to this, the presence of forest owners in the respondents’ social surroundings was not significant. Respondents who spent a large share of their leisure time in rural areas stressed ‘Preservation and recreation’ values more strongly than others did, whereas this variable was non-significant for ‘Production’ values. In both models, respondents who enjoyed discussing forest issues had higher factor scores in comparison to those who did not. Respondents who had visited the countryside often as children emphasised ‘preservation and recreation’ more strongly than did those without this past connection to rural areas, but the variable was not significant in the ‘production’ forest values. Finally, respondents who grew up on agricultural or forest farms stressed ‘preservation and recreation’ values less than did those who grew up in different settings. This variable was non-significant for ‘production’ values.

CONCLUDING DISCUSSION

This study set out to scrutinise the views of private forest owners and the general public in Sweden on the diverse values of the forest. While the divergence across the groups in

the case of ecological and social values is in line with previous research, the lack of a significant difference of views concerning the economic importance of the forest is somewhat surprising. Given their different relations to the forest as ‘insiders’ and ‘outsiders’, forest owners and the general public could be expected to hold different views, which might in turn result in conflicting priorities (Kaltenborn & Williams 2002). Instead, there appears to be some scope for common ground across the groups. Similar to the forest owners, whose personal economic interests probably exert an influence, the views of general public appear to reflect recognition of the economic importance of the forest industry. However, the views on ecological and social values (‘preservation and recreation’) are a different story, and it would appear that this is an area where conflict over forest use may arise and trigger the need to negotiate and trade off different ecosystem services and different aspects of sustainable land use against each other. In this, the two stakeholder groups enjoy different levels of power and influence over forest use. Although forest owners have the upper hand, their power is nevertheless circumscribed by, for example, forest and environmental legislation, including the status of nature conservation and outdoor recreation as interests of national importance to be taken into account in land use planning decisions in accordance with the Swedish Environmental Code (1998), thus catering to the interests of the general public at least to some extent.

As a result of processes of diversification of forest land use, augmented demand and competition over the forest resource can be expected. However, the apparent common ground across the groups may suggest that dichotomous distinctions are not necessarily as explanatorily relevant as they are often assumed to be (Kaltenborn & Williams 2002) and that factors other than forest ownership, for example, personal connections to rural geographies, are potentially more important for views on forest values. However, conflicts of aims are likely to become more tangible in the face of concrete situations. For instance, local competition over forest land use may trigger ‘NIMBY’ reactions (Sarr & Puettmann 2008). In future research, the

relation between forest values on different levels should be explored further, for instance how general values are altered when grounded in actual conditions across geographical scales.

In countries such as Sweden, where forests dominate the land use patterns and are used extensively, the importance of forest land use development is not geographically restricted to rural areas. Rather, it also applies to forests located towards the urban end of the rural–urban continuum, including urban fringe forests, which serve the urban population with recreational environments. These forests can be expected to be particularly exposed to tensions because of high demand. Satisfactorily catering to multiple goals and different views presents challenges for forest planning and management, which must accommodate forest values within the ecological, social and economic spheres. Thus, multi-functional land use practices represent a potentially fruitful strategy for achieving this goal (e.g. Verburg *et al.* 2009).

A number of ongoing processes – for instance the multiple and changing uses of the forest, rural restructuring, blurring of the distinctions between rural and urban environments, and diversification and changes within the forest owner corps – call for exploration of how different stakeholder groups view forests and how this may translate into different approaches and behaviours. This research adds to this body of knowledge and can inform forest related planning, management and policy through guidance in regards to where contestation over forest lands becomes most salient. It would appear that this happens in the sphere of the ecological and social values rather than the economic values of the forest.

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Notes

1. Approximately 50 per cent of Swedish forest is owned by non-industrial private land owners (Swedish Forest Agency 2013).
2. According to the Millennium Ecosystem Assessment, an ecosystem is ‘a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit’ of which humans are an integral part (MA 2003, p. 8).
3. The definition and classification of ecosystem services are the subject of some debate (e.g. Wallace 2007).
4. The gross sample size was 2,000 for the general public and 2,100 for the forest owners (1,050 residential and 1,050 non-residential). The net sample size was 1,992 for the general public and 2,092 for the forest owners.
5. In the descriptive analysis, the continuous variables were transformed into categories, and the number of categories was reduced for some categorical variables. Self-reported interest in forest issues and knowledge of practical forestry and forest legislation, respectively, were transformed from the original 1–7 scale into three categories: ‘low’ (1–2), ‘mid’ (3–5) and ‘high’ (6–7). However, the variables were used in their original form in the subsequent multivariate regressions.
6. The correlations between the independent variables were checked to assess the risk of multicollinearity. The correlations were at acceptable levels, the highest being just shy of 0.6. The highest correlations were found for the variable pairs ‘What is the distance from your home to the nearest forest area’ and ‘What is the distance from your home to the forest area you most often visit’; and ‘Which type of area did you mainly live in while growing up’ and ‘I grew up on an agricultural/forest farm’ (the latter is an item within the question ‘Which connections do you have to forests and rural areas’).
7. Tourism may entail commercial as well as non-commercial activities. However, since this variable item loaded highest on the first dimension (‘preservation and recreation’), it appears that the respondents interpreted it as primarily related to other forms of leisure and recreational activities rather than the economic activities captured in the second dimension (‘production’).
8. Note that this variable was coded in such a way that a low value represents a high frequency of

forest visits and a high value corresponds to a low frequency; hence the 'backwards' interpretation.

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