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The tension between nature conservation and economic valuation of ecosystem services

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Citation

Admiraal, J. F. (2016, December 1). *The tension between nature conservation and economic valuation of ecosystem services*. Retrieved from <https://hdl.handle.net/1887/44588>

Version: Not Applicable (or Unknown)

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Author: Admiraal, J.F.

Title: The tension between nature conservation and economic valuation of ecosystem services

Issue Date: 2016-12-01

Chapter 6

Motivations for committed nature conservation action in Europe

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Submitted to Environmental Conservation. Under review.

Abstract

Despite ongoing efforts to motivate politicians and publics in Europe for nature conservation, biodiversity continues to decline. Monetary valuation of ecosystem services sees popular usage to get people acting for nature, but appears to be insufficient to motivate people, suggesting that non-monetary values have a crucial role to play. In extant literature, there is insufficient information about the motivations of actors who have been instrumental in successful conservation projects. We investigated the motivations of these biodiversity actors for their work using a ranking of cards, and compared the results with the rankings of motivations of a second group of actors with more socially related interests. For both groups of actors, action for biodiversity is supported in general by two groups of motivations related to living a meaningful life and moral values. The social actors noted in addition that their action for biodiversity rested more on beauty, place attachment and intrinsic values in comparison with their main non-biodiversity interests. Our results have implications for environmental policy and biodiversity conservation in that the current tendency of focusing on economic valuation of biodiversity fails to address the motivations exhibited by successful actors, and thereby fails to motivate nature conservation on an individual level.

Keywords

Biodiversity conservation, ecosystem services, environmental policy, economic valuation

1. Introduction

As reported by the European Environmental Agency, biodiversity in Europe is in a crisis of continuous decline (EEA 2015). The Eurobarometer (EU 2015) investigation shows that biodiversity degradation is considered a serious topic by eight out of ten Europeans, yet this concern apparently is not translated into successful action (Pearce 2007). The rise of the ecosystem services concept (e.g. MEA 2005) and the economic valuation of these services can be seen as an attempt to adequately inform private and public decision making to address this problem; economic valuation is used to prove that biodiversity, with values approaching trillions of euros worldwide, is worth protecting (Costanza *et al.* 1997; TEEB 2013; Costanza *et al.* 2014). Ecosystem services as a concept attained a broader global institutionalization, as is visible for example in the global initiative TEEB (2013), the World Bank's WAVES partnership (WAVES 2015) and a large-scale research programmes such as IPBES (IPBES 2015) and the European Horizon 2020 (Admiraal *et al.* 2016), making ecosystem services the foremost way to express the value of biodiversity to society.

However, the ecosystem services approach appears to fail in its motivational objective to stimulate European governments and the general public to prevent further biodiversity degradation (Tittensor *et al.* 2014). Within the ecosystem services community, this failure has prompted reflections on its limitations (O'Neill 1997; Norgaard 2010) and calls for caution about its promises (Locatelli *et al.* 2013). Specifically, economic approaches may crowd out other, non-economic motivations (Rode *et al.* 2015; Luck *et al.* 2012; Gómez-Baggethun & Ruiz-Pérez 2011). This corresponds with research from outside the ecosystem services community, demonstrating that committed action for nature rests on grounds other than economic values, such as the development of trust between stakeholders and other moral standards (Hiedanpää & Borgström 2014; Flint *et al.* 2013; Sponarski *et al.* 2014) and room for autonomous action in conservation initiatives (Dedeurwaerdere *et al.* 2016).

Extant literature paints a complex picture of personal motivation to act for biodiversity. This picture must be understood more fully in order to grasp where current efforts to motivate people fall short. Environmental psychology has conducted a large number of studies about motivation for environmental action, but this research is often focused on single factors assumed to be pivotal for action. Examples include connectedness to nature (Mayer & Frantz 2004), egoistic, altruistic, and biospheric environmental concerns (Schultz 2001), place attachment (Williams & Vaske 2003), community (Asah & Blahna 2013), subjective norms (Fornara *et al.* 2011), empathy (Schultz 2000), time perspective (Corral-Verdugo *et al.* 2006), views on human-nature relationships (Van den Born *et al.* 2001) and emotions, habits and rational choices (Carrus *et al.* 2008). These studies almost invariably conclude that the factors of interest perform a role in environmental behavior.

What remains unknown is how these factors act in concert or in relation to each other. Gifford & Nilsson (2014) for example, recognize this diversity of factors in the literature and provide an overview of no less than 17 'categories of influence' on environmental behaviour, and conclude that research should focus on how these influences interact with each other. In search for theories of interaction, several studies depart from a relatively wide set of motivational factors. Kollmuss & Agyeman (2002), for example,

attempted to incorporate multiple factors, including knowledge, values, attitudes, emotions and more. Clark *et al.* (2001) and Ryan & Deci (2000) distinguish between internal and external influences on behavior. Perkins (2010) combines several factors to measure people's emotional relationship with nature. The general findings of these studies are that these factors are in fact related to each other and that humans do not act for nature primarily to safeguard ecosystem services but for a complex combination of reasons that is very difficult to model.

What motivates individuals to protect the environment therefore remains a key issue of investigation, and an interdisciplinary approach is needed for a better understanding of this complex issue (Perkins 2010). The present paper stands in this tradition of interdisciplinary, 'multi-factor studies', with the added value of focusing on a group of highly committed individuals as so-called 'biodiversity activists'. This group forms an important yet underexplored source of information about motivations to act for biodiversity.

Conservation motivations of committed 'biodiversity activists' likely differ from people who engage in other causes such as urban social development or care for invalids. Such social or 'non-biodiversity activists' may engage in conservation activities only in the margin of their lives, e.g. when donating to a conservation charity. Regarding motivations, a life-time devotion to biodiversity conservation might be driven by moral values while a marginal action might be motivated by a felt obligation or a social norm. To clarify how the motivations for conservation of committed actors might differ from non-biodiversity focused actors, we compare our 'biodiversity activists' to 'activists committed to other causes'. Our research question was: how do committed actors for biodiversity and committed actors for non-biodiversity causes rank their motivations to act for nature, given a broad set of motivational options? Mapping the specific motivations that they rank themselves would provide clarity that could help to stimulate both committed conservationists already working in the field and people acting for nature in the margin of their lives.

2. Methods

2.1. Participant Selection

The study was part of a greater European FP7 research project named BIOMOT (2011). Within this project, an interdisciplinary team of researchers from Belgium, Finland, Germany, Italy, the Netherlands, Slovenia and the United Kingdom investigated what motivates people to act for biodiversity and to explore alternative ways for valuing biodiversity. In each country, conservation leaders were interviewed using the same data collection methods to map their individual motivations for conservation action. The project recognized that motivation for biodiversity conservation can play out in many sectors of society, from managers making strategic decisions in business to elementary school teachers stimulating wonder of nature in children. Living up to this diversity, a list of three sectors with sub-categories was used as a criterion for selecting interviewees. These sectors were (i) the public domain (including local governments, city parks and projects part of Natura 2000 and UNESCO-MAB networks), (ii) business

(including fishing, farming, forestry, food production, corporate land ownership and tourism) and (iii) civil society (including school teachers, NGOs, foundations, media professionals, civil activists).

For each sub-category in the list, a committed actor for biodiversity conservation was identified in each country. 'Committed actor' was defined as any person who spends much more time or energy for the cause of biodiversity conservation than could be expected from normal citizen or job duties. Examples of committed actions include founding a biodiversity NGO, radically greening a firm or spending tireless energy on nature education. For simplicity's sake, we call them 'biodiversity activists' here, but it should be kept in mind that this term includes many non-political actors, such as bureaucrats and school teachers. Then, a second committed actor was identified who worked in the same category (e.g. schools, government, media) but without a strong conservation commitment. For simplicity's sake again, we name them 'non-biodiversity activists' here, to which the same caveat applies as with the biodiversity activists. For example, in the sub-category 'food', in each country an actor was identified who pushed through a change in management in a company towards biodiversity-friendly methods. This would be the biodiversity activist. For selecting a non-biodiversity activist, a similar production company was identified in the same country that did not make a similar commitment to biodiversity conservation and an actor was interviewed from a similar occupational role as the biodiversity activist. In many cases, this actor worked committedly for another goal, such as poverty reduction, projects for disabled people, community building or any other goal not directly related to biodiversity.

2.2. Interview Structure

The interview consisted of a semi-structured life-history part, followed by a sorting of cards that displayed motivations. In the life-history part, the interviewees reflected on the history of their committed actions, in the context of their more general life story. For the cards sorting element that is the focus of the present paper, the life-story part acted as a 'primer', focusing the interviewees on the full extent of their actions and developing a 'feel' of how their actions were embedded in the context of their life (see Table S1 for the interview structure). On that basis built in the life-history part, the interviewees were given a set of twenty cards, with a motivation on one side and on the other side a brief explanation of the motivation. The full list is shown in Table 1. The interviewee was asked to rank the cards on a 6-step scale from most important (6) to least important (1), and was allowed to freely distribute the motivations over the 6 scales.

The procedure of the card rankings differed between the biodiversity activists and the non-biodiversity activists in that the latter were asked to rank the cards twice: once for their non-biodiversity cause, which was their main cause and defined by the interviewees themselves, and the second time for any biodiversity action they had engaged in. Their actions for biodiversity were usually fairly minor, e.g. making a small monthly donation to a conservancy or some hours of volunteer work. The resulting motivational rankings of both groups of actors allowed us to make three comparisons:

1. The difference in motivations to act for biodiversity between both groups of activists.
2. The difference in motivations of the biodiversity activists to act for biodiversity on the one hand, and the motivations of the non-biodiversity activists to act for their main causes on the other.

3. The difference in motivations within the group of non-biodiversity activists to act for their main cause and for biodiversity.

2.3. Creating the Motivation List

The list of twenty motivations for the card set has been grounded in a two-step, multi-disciplinary exploration that sought representation of fundamental motivational concepts found in philosophy, social psychology and governance science. The first step was a literature review carried out by researchers of these disciplines in the BIOMOT project, subsequently compiled into a reference document (BIOMOT 2013). The second step consisted of workshop discussions between all BIOMOT researchers, in which the scientific basis was enriched by a pragmatic reflexivity (Popa *et al.* 2014). These discussions were inspired by the professional experience and cultural diversity of the BIOMOT researchers, resulting in a list of 20 motivations that was considered ‘saturated’ (i.e. comprising all fundamental concepts).

The concepts from the various disciplines appeared to overlap well in meaning; examples are the items of ‘hedonic’ in Schwartz (1992) and ‘instrumental’ in Muraca (2011), and the items of ‘power’ in Schwartz (1992) and ‘control’ in Fiske (2014). Another example of an overlap of concepts is that the concept of ‘connectedness’ was found in the literature from different fields, including environmental psychology (Tam 2013) and philosophy (Nolt 2006). However, on the level of overarching concepts that authors tend to use in order to arrive at a structured classification, interdisciplinary convergence turned out to be impossible. For example, motivations can be grouped in classes such as intrinsic versus extrinsic, or individually based versus group-based, or hedonic versus moral, or economic versus non-economic, but these classes could not be molded into a single structured classification. This is corroborated by Kollmuss & Agyeman (2002) who encountered similar problems in combining models of environmental behavior. As a consequence, the 20 motivations represents values, emotional states and end goals, which can all be potential motivations. Also, as a result, they were presented as an *unstructured* list (Table 1), open to be classified in follow-up studies depending on aim, research context or disciplinary tradition. The cards were translated and back-translated in the interviewee’s local language.

Motivation	Given description on the card
Anger	You are motivated by anger, disgust, contempt or other negative emotions towards individuals, groups or events.
Insecurity	You are motivated by a sense of insecurity or anxiety and your desire to reduce these feelings.
To end or prevent conflict	You are motivated by a desire to end or prevent a collision between people.
Duty	You are motivated by a sense of duty, responsibility and/or obligation.
Religion or spirituality	You are motivated by a religious or spiritual belief or practice. (You are allowed to choose between the two.)
Beauty	You are motivated by beauty or other aesthetic qualities.
Curiosity and learning	You are motivated by a fascination with complexity of things and the opportunities they provide for learning.
Value in itself	You are motivated by a belief that some things are valuable in themselves, regardless of their usefulness to you or others.
Connectedness	You are motivated by a feeling of connectedness to something larger than

	yourself and your feelings of care and affection for this larger whole.
Attachment to place	You are motivated by your attachment to a particular place or places.
My children/family	You are motivated by your care and concern for your children or family.
Future generations	You are motivated by your care and concern for, or feeling of solidarity with, future generations of humans.
Recognition	You are driven by the desire to gain positive recognition from those around you, because this makes your life more significant.
Control	You are motivated by a desire to have influence and to exercise that influence.
Living a worthwhile life	You are motivated by a desire to live a good, meaningful and worthwhile life.
Destiny	You are motivated by a belief that you have a calling.
Social benefit	You are motivated by a desire to promote a benefit for your community or wider society.
Personal benefit	You are motivated by a desire to promote a benefit for yourself.
Pleasure in doing what you are good at	You are motivated by the pleasure in doing things that you are good at.
Pleasure of doing things with others	You are motivated by the pleasure in joining in and collaborate with others.

Table 1: the 20 motivations with a short description of each, as presented to the interviewees.

In total, 217 interviewees took part in the cards ranking. Roughly half of the 217 interviewees (109) were classified as “biodiversity activists” and 68 were classified as “non-biodiversity activists”; 40 interviewees were re-classified as not being part of either of the two groups, since it turned out in the interviews that they did not devote much more than their job requirements to any cause. For clarity of interpretations, they were not taken up in the analysis. Due to coordination difficulties between partners, in three countries (Belgium, Finland and the UK) the non-biodiversity activists were asked to rank the cards only for their main cause, but the total numbers of the rankings in the entire dataset were still considered sufficient for the three comparisons.

2.4. Statistical Analysis

We used R (R Core Team 2012) and *lme4* (Bates *et al.* 2015) to create a linear mixed-effects model to analyze the relationship between the scores (1-6) given to the 20 motivations, taking along variables for activist type (biodiversity or non-biodiversity), subject (biodiversity cause or non-biodiversity cause), gender and country as fixed factors. All the interactions between the fixed factors were included in the model. The scores of an individual interviewee may not be independent from each other because individual interviewees may rank motivations generally higher or lower than other interviewees. For this reason, individual interviewees were regarded as a random factor in the model. Since all our fixed factors were categorical, the linear mixed model used here estimated the differences in scores (1-6) per motivation between activist types and subjects. These estimates were standardized to t-values. Due to the random factor of the individual interviewees, the degrees of freedom are no longer well defined, which makes it impossible to properly estimate the p-values. However, we considered t-values lower than -2 and higher than 2 as critical values to indicate a significant difference between the scores, as these values correspond in probability with $p < 0.05$.

The model also enabled us to test the difference between activist types by applying a Likelihood Ratio Test, i.e. testing the effect of removing activist type from the model on its data fit (likelihood). In the same way we tested the effect of subject, gender and country. The differences that activist type, subject, gender or country made on the model were estimated in p-values.

3. Results

In the ranking of motivations of biodiversity activists, the ten highest ranking motivations differ little in their score (Fig. 1a). This suggests that conservation action is founded on a broad selection of possible motivations. High ranking motivations are *curiosity and learning*, *value of nature in itself*, *living a worthwhile life* and *future generations*. Notably, motivations that point to instrumental values of biodiversity such as *personal benefit* and *self-significance* received a low rating. Other motivations that point to self-expression or self-assertion, such as *anger*, *control* and *insecurity*, also received a low rating, possibly because of negative connotations attached to them. *Religion or spirituality* and *destiny* also received a low rating on average.

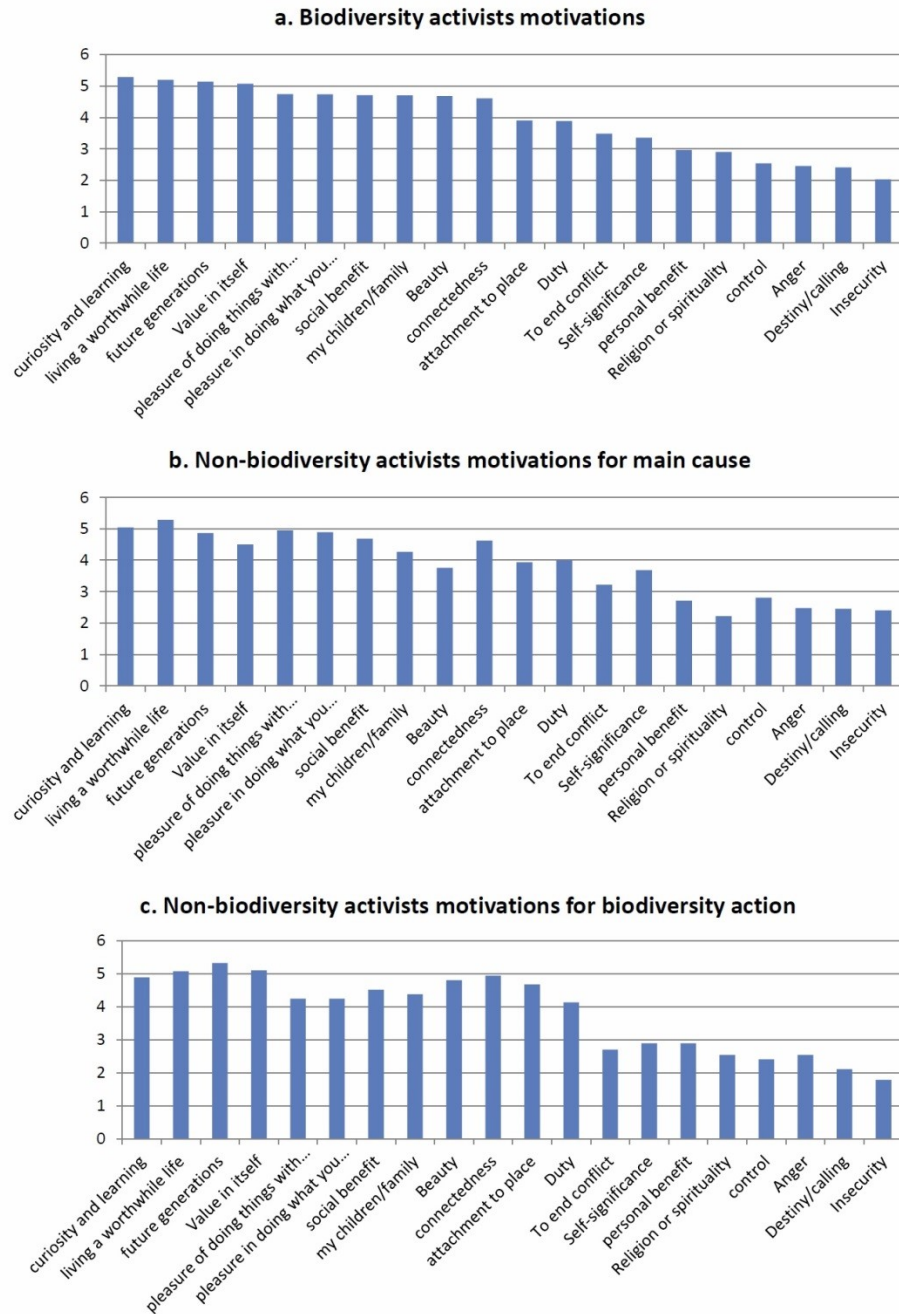


Figure 1. Motivations of biodiversity activists and non-biodiversity activists for their main interest and actions for biodiversity.

Significant differences exist between the rankings by biodiversity activists and non-biodiversity activists for their main interest (biodiversity cause or non-biodiversity cause) (Likelihood Ratio Test, $\chi^2=54.996$, $Df=20$, $P<0.001$), although most motivations are ranked similarly high or low between the two groups (Fig. 1). More precisely, *value in itself*, *beauty* and *religion or spirituality* received significantly lower ratings by the non-biodiversity activists for their main cause than by the biodiversity activists for their

biodiversity cause (Table 2). Nevertheless, *religion or spirituality*'s rating is low relative to the other motivations, indicating that it generally plays a small role.

Motivation (as presented on card)	Biodiversity activists	Social activists (main interest)		Social activists (biodiversity)		
		Average	T value vs Biodiversity activists	Average	T value vs Biodiversity activists	T value vs Social activists (main interest)
Curiosity and learning	5.29	5.04	-0.885	4.89	-1.587	-0.533
Living a worthwhile life	5.20	5.28	0.223	5.08	-0.513	-0.656
Future generations	5.14	4.87	-0.902	5.32	0.334	0.978
Value in itself	5.07	4.50	-2.022*	5.11	-0.467	1.350
Pleasure of doing things with others	4.75	4.96	0.642	4.24	-1.749	-1.915
Pleasure in doing what you are good at	4.74	4.90	0.408	4.24	-1.721	-1.767
Social benefit	4.71	4.69	-0.14	4.51	-0.762	-0.583
My children/family	4.71	4.27	-1.473	4.38	-1.028	0.116
Beauty	4.68	3.76	-3.358*	4.81	-0.155	2.438*
Connectedness	4.61	4.63	-0.023	4.95	0.303	0.633
Attachment to place	3.91	3.94	-0.073	4.68	1.535	1.661
Duty	3.89	4.00	0.428	4.14	0.305	0.184
To end conflict	3.49	3.22	-0.995	2.70	-2.167*	-1.443
Self-significance	3.36	3.69	1.105	2.89	-1.674	-2.119*
personal benefit	2.96	2.71	-0.856	2.89	-0.533	0.278
Religion or spirituality	2.91	2.22	-2.371*	2.54	-1.249	0.627
Control	2.54	2.81	0.725	2.41	-0.78	-1.145
Anger	2.46	2.48	0.074	2.54	0.45	0.266
Destiny/calling	2.41	2.45	-0.053	2.11	-1.251	-1.005
Insecurity	2.04	2.40	1.154	1.78	-0.984	-1.685

Table 2. Motivation rankings, with t-values in bold. An asterisk (*) signifies a significant difference of a t-value <-2 and >2.

A follow-up question is then which motivations would be important for non-biodiversity activists to take up action for biodiversity conservation (Fig. 1c). For the ranking of motivations to act for biodiversity,

significant differences appear to exist between the two groups of activists (Likelihood Ratio Test, $\chi^2=33.694$, $Df=20$, $P=0.028$). The pleasure motivations (*pleasure in doing what you are good at* and *pleasure of doing things with others*) are rated lower by the non-biodiversity activists than by the biodiversity activists, and so is the *to end conflict* motive (Fig. 2). This suggests that non-biodiversity activists find less pleasure in biodiversity conservation than in their main interest, might usually not work together with others to act for biodiversity, and feel less driven to deal with conflicts involving biodiversity conservation. Yet in comparison with their motivations for their main interest (Likelihood Ratio Test, $\chi^2=60.945$, $Df=20$, $P<0.001$), it becomes clear that *beauty* is an important motive to act for biodiversity for the non-biodiversity activists as well, as they rank it significantly higher for biodiversity conservation-related action than for their main interests (Table 2). No similar raise is seen in the ratings for *value in itself* and *religion or spirituality* for biodiversity conservation, suggesting that these motivations are less important for this group for biodiversity conservation. Action for biodiversity conservation also turns out to be less related to their sense of *self-significance*.

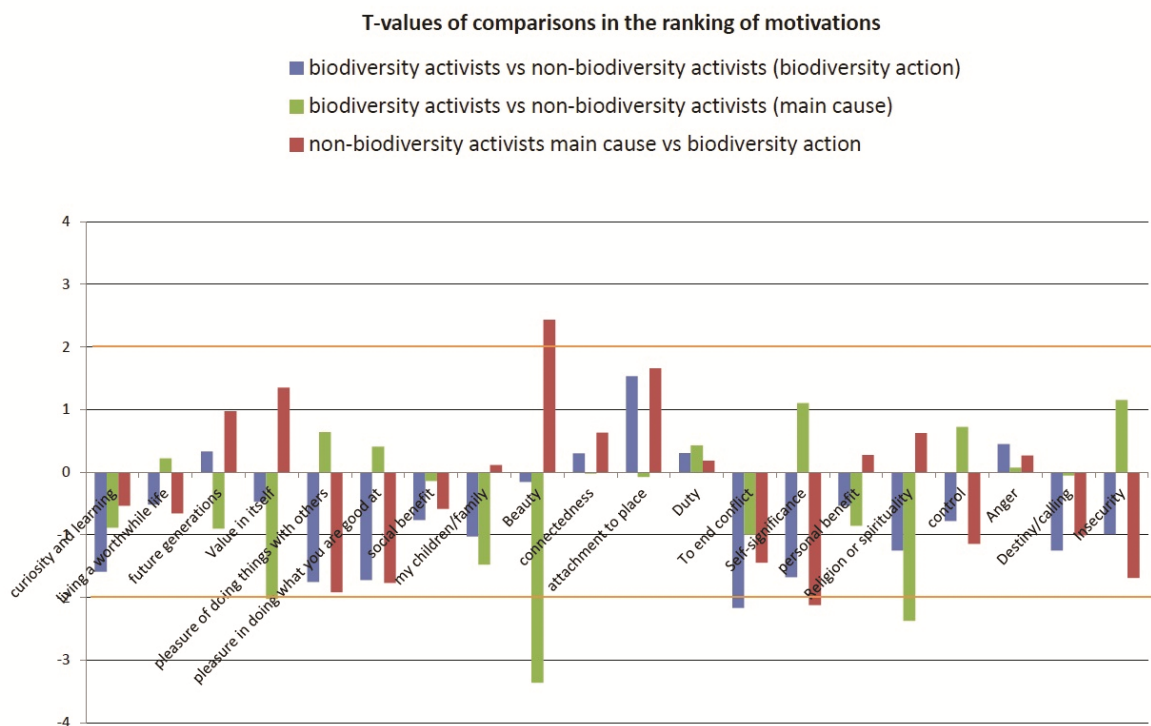


Figure 2. T-values of the comparisons of motivation rankings. Orange lines showing values >2 and <-2 , which signify a significant difference.

The same three comparisons between biodiversity activists and non-biodiversity activists and their rankings of motivations were explored further for effects of gender and country. No significant effect of gender was found in the model for the comparison between the two groups of activists and their rankings of motivations for their main interest ($P=0.2154$), nor for biodiversity conservation ($P=0.8811$). Also, in the comparison within the non-biodiversity activists group between main interest and biodiversity conservation for, no significant effect for gender was found ($P=0.1488$).

In the comparison between biodiversity activists and non-biodiversity activists for their main interest, a significant effect was found for country of origin (Likelihood Ratio Test, $\chi^2=423.95$, $Df=240$, $P<0.001$). The greatest differences between the countries could be found in the rankings of Germany and the United Kingdom, whose non-biodiversity activists scored significantly higher for many motivations than the other countries. However, the motivations *value in itself*, *beauty* and *religion or spirituality*, which differed the most in the total comparison (Fig. 2), were ranked similarly among the countries, suggesting that although the average ranking between countries may differ, a common trend occurs in which the same motivations are rated differently between biodiversity activists and non-biodiversity activists in all countries. Further comparisons between the rankings for action for biodiversity were not possible, since this ranking was not performed by the non-biodiversity activists in three countries.

4. Discussion

4.1. Overview

Although the rankings by biodiversity activists for their work in conservation differ significantly from the rankings by non-biodiversity activists for their main interests, a deeper investigation into the individual rankings of motivations clarifies that only a few specific motivations show a significant difference between these two groups, and the top and bottom motivations are very similar in both groups (figure 2). This suggests not only that biodiversity conservation is supported by a broad palette of motivations, but also that this palette of motivations for committed action is shared amongst people regardless of the topic of interest. The lack of significant gender differences and the similarities in ratings between the countries further underscore a universality of these motivations. The four top ranking motivations for biodiversity action could be interpreted as aggregating into two groups: (i) living a meaningful life (*living a worthwhile life* and *curiosity and learning*) and (ii) moral values (*future generations* and *value in itself*). Both value-groups have a crucial role to play in motivation for biodiversity conservation. We explore this broad palette more deeply underneath.

The motivations referring to living a meaningful life make a set of values explicit that have been called *eudaemonistic*, and differ from hedonic or moral values (Muraca 2011) and from the welfare maximization in neo-classical economics (O'Neill & Spash 2000). Ryan *et al.* (2008) define the meaningful life as self-realization, based on the fulfilment of three fundamental psychological needs: autonomy, competence, and relatedness. The notion of eudaemonistic value can be traced back to Socrates and Aristotle and originally referred to the obligation of every human being to “live in truth to his or her daemon” a kind of inner voice speaking about good or bad (Norton 1976). The concept is still used in literature on motivation (Ryff & Singer 2008) and also appears in the ‘quest for significance’ theory of Kruglanski *et al.* (2009). In environmental psychology, analogous concepts surface in environmental self-identity (Van der Werff *et al.* 2013) and ecological responsibility (Jagers & Matti 2010), which refers to how people regard themselves and their environmental behavior.

The highly rated motivations of *value in itself* and *future generations* refer to moral values, inciting people to act beyond self or group interest. The public perceptions of nature's value in itself, often called intrinsic value, have been investigated before in European countries (Buijs & Volker 1997; Grendstad & Wollebaek 1998; Widegren 1998; Butler & Acott 2007; Van den Born 2008), leading to the consensus that the great majority of people recognize the intrinsic value of nature. This is corroborated by research into human-nature relationships. As shown by Kempton *et al.* (1995), De Groot & Van den Born (2007) and De Groot & De Groot (2009), respondents show very high levels of adherence to ecocentric stewardship in which people are seen as part of nature, responsible for taking care of nature and for preserving nature for future generations.

For the non-biodiversity activists, motivations to be involved in biodiversity conservation are largely the same as for the biodiversity activists in that *future generations*, *value in itself* and *living a worthwhile life* are rated highly. However, the pleasure motivations of *working with others* and *doing what you are good at* have less importance for non-biodiversity actors for these activities, and so does the motivation of *self-significance*. These differences may be explained by that non-biodiversity activists already achieve their pleasure and self-significance motivations through their main non-biodiversity interest, an explanation corroborated by the higher scores of these motivations for the non-biodiversity action. In contrast, other motivations appear to be more important for non-biodiversity activists to act for biodiversity: *nature's beauty*, *attachment to place* and *nature's value in itself*. This finding suggests that the discovery of beauty and values in nature and landscapes, even though not prime motivations for devoted biodiversity activists, may be foundational in the motivations to act for nature by less committed actors. Richards (2001) has argued how beauty could support environmental awareness. Stimulating biodiversity actions amongst non-biodiversity activists may require a change of focus to underline these specific motivations.

4.2. Limitations

The study method used has some limitations. First, it is possible that the respondents interpreted the formulation of the motivations on the cards slightly differently. One example of this validity issue is the description of the connectedness card, which refers to "connectedness with a larger whole", which might have been too esoteric for respondents who do feel connected with nature but on a more singular level, e.g. connected with the local forest, with animals etc. This may explain why scores for *connectedness* are lower than expected. Connectedness has been introduced before as a key motivational drive (Tam 2013), and Nolt (2006) suggested that in order to act for a valuable thing, we need to feel connected to that thing. It is therefore possible that a feeling of connectedness with nature underlies many other motivations, but is considered less salient when put next to the other motivations. Another limitation of the method is that strictly speaking, some cards describe values, other cards describe emotional states and yet others emphasize end goals. Consequently, it is unclear how much this lack of homogeneity in the list influenced the ranking by the respondents (*cf.* Ryan *et al.* 2008). Also, social relations and conflicts of interest that may be very relevant in real-life situations are not covered in the card ranking method, which may explain the low ranking of the *personal benefit* and *control* motivations. Social desirability and positive or negative framing of motivations may influence the ranking

of some cards, such as *living a worthwhile life* or *insecurity*. Finally, because our data was gathered only in European countries, it is unclear to what degree our data are generalizable to other regions.

4.3. Policy Relevance

Ecosystem services and economic values are increasingly communicated in policy as the main reasons to act for biodiversity. Although motivations such as *curiosity and learning*, *value in itself*, *living a worthwhile life* and *beauty* can be framed into the abstraction of ‘cultural ecosystem services’ in the form of education and spiritual services (MEA 2005), and groupings of ecosystem services appear to be connected with different values (Hicks *et al.* 2015), a back-translation from services to motivation appears to be problematic in environmental policy. The functionalistic outlook of the ecosystem services concept, in which biodiversity produces services for consumption by individuals, may be inappropriate to express and stimulate motivations to act, as human-nature relationships appear to be more complex than that (Flint *et al.* 2013).

Our results offer scope to address these motivational limitations of ecosystem services to stimulate motivation for biodiversity conservation. On the one hand, the highest ranking motivations driving biodiversity activists may be recognized and supported in order to stimulate their ongoing activities and the growth of new young conservation enthusiasts. Such motivations would be curiosity and learning about nature, seeing conservation as a part of living a meaningful life, caring for future generations, and nature’s intrinsic value. On the other hand, to involve actors from other sectors, a slightly different set of motivations may be addressed, such as: a stronger focus on natural beauty, the inherent values of biodiversity and what biodiversity means for local development and identity. Space must be created for such non-monetary values to be expressed in participatory and deliberative valuation and decision making.

This study shows that people act for biodiversity mainly out of eudaimonistic values and moral values. Ecosystem services itself may provide an initial inspiration to get more people on board, but is limited in motivating conservation leaders and does not halt biodiversity loss on its own. Acknowledging the full gamut of motivations is necessary to inspire conservation leaders and get more people on board for nature conservation. An improved policy basis for biodiversity conservation would therefore consist of three elements: (i) nature is *meaningful* in the lives of people, (ii) nature is perceived as having *intrinsic* values and (iii) nature delivers economic *benefits*. Advertising only the economic benefits of nature offers a weak and possibly even counter-productive motivational basis for large-scale individual action for biodiversity.

Supplementary Material

For supplementary material accompanying this paper, visit <http://www.journals.cambridge.org/ENC>

Acknowledgements

This material is based on work supported by the European Research Council under FP7 Grant Agreement FP7 282625, BIOMOT: MOTivational strength of ecosystem services and alternative ways to express the value of BIODiversity. The authors are grateful to the interviewees who participated in this study.

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Supplementary Material

Table S1. Interview structure.

Thank you for your willingness to participate in our research.	
We are interested in your drives to do something for nature or for society, something you do with your heart and conviction. In this interview we want to talk with you about this endeavor, this main thing, and your passion to do so, whether this main thing is nature or something else and whether it is big or small. Together we want to try to identify your motivations and inspirations.	
This interview consists of three parts. First, we want to briefly talk about the things you consider to be important for you to do for society or nature. After that we want to investigate, together with you, how these ideas and motivations came about, and how they are connected with your life course. Finally we would like to explore some of these motivations, to deepen our insight.	
I ask permission to record this conversation. This is for methodological reasons. It makes it easier to work out the interview, guarantees punctuality and prevents misquoting. It also enables me to write less during the interview, although I will make some notes. Is that all right with you?	
All data will be dealt with in confidence.	
PART 1 main thing	
Main questions	Probes/checklist
<i>For the interviewers: choose an introduction you feel comfortable with. If you already know something about what the person is doing (can be the reason that he/she is selected for this interview) you can start with that.</i>	
What would you describe as the main thing you do in society?	<i>Main thing can be nature; can be something else Main thing can be something in work; can be something else</i>
We will take a more detailed look later, but could you already tell me now roughly what you think are the major drivers for [main thing]?	
What is the role of [main thing] in your work?	Try to get a broad idea of the work he/she does and the connectedness of work with [main thing]
PART 2: life course	
We are looking for the connections between the main thing you do with the history, the course of your life. Life experiences and the place where you grew up, for instance. . That is why we want to go back with you to some periods in your life and see whether we can detect a few of those connections.	
Main questions	Probes/checklist
<u>Period till 15th year</u>	
Did this [main thing] emerge in early youth ? (till 15 th year)	If yes, ask for more details. For instance frequency of actions; important persons; feelings etc.
We have some questions to go a little bit deeper into that period and we would like to talk about the physical and the social environment of your childhood.	

Physical: - where did you grow up?	<i>To get a main picture of the physical place of growing up</i> -is this a city, a village, or the countryside -can you describe the house wherein you grew up? - in case of the countryside; is it a farmhouse -was there a garden by the house; if so, can you describe it?
-in what kind of neighbourhood did you live?	Busy/quiet; many/less buildings; places to play;
Social: Family & role of parents -how was the composition of the family in which you were raised? did your parents work?	
-did the family undertake a lot of activities?	Both? -What kind of work did he/she/they do? -What did your parents really like to do in their free time? (hobbies)
Do you think your parents played an important role in the emergence of [main thing]	If yes, how? What was it ? <i>action/attention/encounter?</i>
Are there, besides your parents, other significant people playing a major role in your early childhood? Did these people play an important role in the emergence of [main thing]?	If so, who and why was he/she important and what role did this person played in your life If so, how?
School Do you think that this[main thing] also emerged at school? Are there any important experiences or persons at school that are of influence on your enthusiasm for [main thing]?	
Peak experiences Are there in your early youth any peak experiences of which you think were of importance for you? Were they of influence on your enthusiasm for [main thing]?	<i>Can be positive or negative experiences; can be nature or social (e.g. confrontation with poverty)</i> Supervised or not?
<i>If main thing is not nature: skip this section</i> Role of nature How would you describe the role of nature in your childhood, and how did you relate to nature? - did you play in nature ?	- Was nature important or not (why) - What was nature for you? What did you consider as nature (nature-image) (wild versus cultivated etc.) - a lot? - what did you do in nature (level of activity: playing in nature versus playing with nature) action/encounter - did you also do things for nature? (help, protect,) - did nature play any role at for instance school, in your peak experiences or in the things you did with your parents?

<u>Period between 15th and 25th year</u>	
Did this [main thing] emerge in later youth ? (between 15 th and 25 th year)	If yes, ask for more details. For instance frequency of actions; important persons; feelings etc.
- can you tell us something about the place or places you lived between your 15th and 25th year?	-moved for study or living on their own or starting a family? - were these cities/villages/countryside
- what were your main activities in this period?	(<i>get an idea of the main life course activities</i>) -work? What kind of work -study? What kind of study
-what did you do most in your free time? Were you active in some sort of clubs?	-alone or in groups What kind of clubs/ how active
What were the most important people for you in this period?	-why were they important -What role did they play in your life -What kind of influence did they have on you?
Did these people played an important role in the emergence of [main thing]?	If yes, how?
Peak experiences Are there in your later youth any peak experiences of which you think were of importance for you? Were they of influence on your enthusiasm for [main thing]?	<i>Can be positive or negative experiences</i>
<i>If main thing is not nature; skip this section</i> Role of nature - In a more general way: how would you describe the role of nature in this period of your life, and how did you relate to nature?	- Was nature important or not (why) - What was nature for you? What did you consider as nature (nature-image) (wild versus cultivated etc.)/(<i>is image of nature changed?</i>) - did you do things <i>in</i> or (also) <i>for</i> nature? Level of activity - did nature play any role at for instance school, in your peak experiences or in the things you did with your parents? - How much free time did you spend on these activities? (approximate hours/week)
<u>Period from 25 till today</u>	
As a last period in your life course we want to look at the time from you were 25 till now. It is too long a time to go through all the details of what happened in your life. So, we want to ask you if you want to tell about the most important events that connect to your [main thing]	
Did this [main thing] emerge in adulthood ? (after 25 th year)	If so how? Ask more details.
- What do you regard as the most important events in your work life?	
- Did [main thing] or motivation for [main thing] play a role in this events? How?	Big changes? Or not. If big change or event: was it a choice or something that happened to you without you having a lot of influence on it?

- What do you regard as the most important events in your private life?	Big changes? Or not. If big change or event: was it a choice or something that happened to you without you having a lot of influence on it?
- Did [main thing] or motivation for [main thing] play a role in this events? How?	
- How much free time did you spend on [main thing] in the peak period of your enthusiasm? (approx. hours/week)	
<i>If main thing is not nature; skip this section</i> Role of nature - In a more general way: how would you describe the role of nature in this period of your life, and how did you relate to nature?	- Was nature important or not (why) - What was nature for you? What did you consider as nature (nature-image) (wild versus cultivated etc.)/(<i>is image of nature changed?</i>) - did nature play any role in your work or private life? - did you do things <i>in</i> or <i>for</i> nature? Level of activity. - what was the role of other people or organisations in this?
Up till now we talked about your work, your life course and your motivations for [main thing]. Can you say something about what you think are your main motivations? And when and where did these motivations come from? Do you see a main path? Do you see any patterns or tensions? One of the patterns we can look for is whether someone is motivated mainly for oneself and immediate family, or for being a good member of groups, or for making a difference in the wider world. Could you say something about this?	<i>First open question, then discuss patterns when you see them</i>
PART 3: cards and reflection In this last part of the interview we want to go deeper into what motivates you. We will do this with the help of cards .	
<i>(For the interviewers: show the category cards, while explaining).</i> We have twenty cards representing different motivations . It is possible for you to lay these the cards, ranging from motivations, which are not at all important for you (to do your main thing), to motivations that are very important, to do so. We have six categories. You can place more cards in each category.	
When looking at the cards like you choose to lay them in the figure, do you see any relations or patterns between the things we discussed about your life course and these cards?	Do you see any relations or patterns between your current work/projects and these cards?
<i>Is there something I did not ask for, of which you think it is important? Or is there anything else you want to tell me?</i>	

SECOND PART OF THE INTERVIEW ABOUT NATURE

Only when main thing is not nature

Intro: We talked about your motivations for [main thing]. However, because our project focus on nature, we want to ask you to tell us something about your relation with nature. We will follow the same structure as in the first part of the interview.

PART 1: life course We are looking for the connections between acting for nature with the history, the course of your life. Life experiences and the place where you grew up, for instance. . That is why we want to go back with you to some periods in your life and see whether we can detect a few of those connections.	
<i>Main questions</i>	<i>Probes/checklist</i>
<u>Period till 15th year</u>	
Role of nature How would you describe the role of nature in your childhood, and how did you relate to nature? -did you play in nature ?	- Was nature important or not (why) - What was nature for you? What did you consider as nature (nature-image) (wild versus cultivated etc.) - a lot? - what did you do in nature (level of activity: playing in nature versus playing with nature) action/encounter - did you also do things for nature? (help, protect,) - did nature play any role at for instance school, in your peak experiences or in the things you did with your parents?
<u>Period between 15th and 25th year</u>	
Role of nature - In a more general way: how would you describe the role of nature in this period of your life, and how did you relate to nature?	- Was nature important or not (why) - What was nature for you? What did you consider as nature (nature-image) (wild versus cultivated etc.)(<i>is image of nature changed?</i>) - did you do things <i>in</i> or (also) <i>for</i> nature? level of activity - did nature play any role at for instance school, in your peak experiences or in the things you did with your parents? - How much free time did you spend on these activities? (approximate hours/week)
<u>Period from 25 till today</u>	
Role of nature - In a more general way: how would you describe the role of nature in this period of your life, and how did you relate to nature?	- Was nature important or not (why) - What was nature for you? What did you consider as nature (nature-image) (wild versus cultivated etc.)(<i>is image of nature changed?</i>) - did nature play any role in your work or private life? - did you do things <i>in</i> or <i>for</i> nature? level of activity. - what was the role of other people or organisations in this?
You told me your actions for nature are..... <i>[or get clarity about the thing he/she does for nature]</i> Can you say something about what you think are your	

main motivations to do this for nature? And when and where did these motivations come from?	Are they different or comparable to motivations for main thing?
PART 3: cards and reflection	
Finally, we will like to know if the things you do for nature show the same pattern as the things you do for [main thing] or a different one. We do it again with the cards. <i>How would you lay the cards for this?</i> When looking at the cards like you choose to lay them in the figure, do you see any relations or patterns between the things we discussed about your life course and these cards?	<i>If things done for nature is so insignificant that respondent protest, skip the cards.</i> Do you see any relations or patterns between your current work/projects and these cards?
<i>Is there something about your relationship with nature I did not ask for, of which you think it is important? Or is there anything else you want to tell me?</i>	