Community attitudes to the European bison *Bison bonasus* in areas where its reintroduction is planned and in areas with existing populations in northeastern Poland

Daniel Klich¹ · Wanda Olech¹ · Rafał Łopucki² · Karol Danik³

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Abstract

The main aim of the study was to assess the attitudes of communities in northeastern Poland to the European bison *Bison bonasus*. Four forest complexes were analyzed: two sites to which animals will be reintroduced in the near future (Augustowska and Romincka forests) and two sites where European bison subpopulations already exist (Knyszyńska and Borecka forests). We also analyzed the factors affecting these attitudes. The survey was based on direct interviews with respondents, and answers were transformed onto a 7-point Likert scale. The results showed that respondents living in areas where reintroduction is planned had more negative attitudes than those living in the vicinity of forest complexes where European bison already lives. The difference was probably a result of myths about the E. bison and crop damage by wildlife. We conclude that proper management of the European bison may lead to higher societal acceptance levels, especially among farmers. Moreover, management and acceptance of the wisent could also influence attitudes to state forests. Negative attitudes to the E. bison can be minimized by workshops that can clarify underlying issues and increase trust towards conservation authorities. The workshops should be aimed at farmers with larger farms and more towards women than men.

Keywords European bison · Attitude · State forest · Reintroduction · Management

Introduction

The success of E. bison (European bison) population development is mainly the result of many years of conservation and close cooperation between countries (Olech and Perzanowski 2014; Klich et al. 2017). At present, 33 countries host the wisent in captivity or free ranging conditions, among which

eight countries are involved in free ranging population development (Raczyński 2017). Alongside the increase in total population numbers, mean subpopulation size has also increased significantly over the past 15 years, which is generally regarded as a positive trend (Olech and Perzanowski 2016). Nevertheless, there are still some undesirable trends. Some of the older local subpopulations have not significantly increased in numbers (Parnikoza et al. 2009; Perzanowski 2014), while other subpopulations have reached or even exceeded the carrying capacities of the forest complexes they inhabit (Olech and Perzanowski 2014). Overpopulated forest complexes can exacerbate the main threats to populations, i.e., the spread of diseases and parasitic invasions that could lead to the elimination of herds (Bielecki et al. 2013; Cabaj et al. 2013; Kęsik-Maliszewska et al. 2014). For this reason, there is a strong need to establish new subpopulations in new locations (Olech and Perzanowski 2016). In addition to evaluating the carrying capacity of areas and various other analyses, the rules of best practice for E. bison reintroduction require social attitudes to be analyzed (Olech and Perzanowski 2014). This is nowadays a necessary component of reintroduction plans, as

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✉ Daniel Klich
daniel_klich@sggw.pl

¹ Department of Genetics and Animal Breeding, Warsaw University of Life Sciences–SGGW, Ciszewskiego 8, 02-786 Warsaw, Poland

² Center for Interdisciplinary Research, The John Paul II Catholic University of Lublin, Konstantynów 1J, 20-708 Lublin, Poland

³ Forest Management and Geodesy Bureau in Warsaw, Lipowa 51, 15-950 Białystok, Poland

local communities have been taking an increasing interest in conservation projects and can impact reintroduction success (Fischer and Lindenmayer 2000).

The E. bison is a species of high public interest due to the history of its restitution (Pucek 1991) and its deep rooting in social consciousness via its existence in public life and art (Samojlik 2005; Makowski 2005; Sztych 2008). This species is under legal protection across Europe, under the Habitats Directive (92/43/EEC) of the European Union, within which it is listed as a priority species. In Poland, the wisent is a species under strict protection, and the principles of its population management are stipulated in the “Strategy for the protection of the wisent *Bison bonasus* in Poland” (Ministerstwo Środowiska 2007). Moreover, the E. bison is regarded as an umbrella species, i.e., conservation actions aimed at this species can result in the protection of habitats for many other species (Olech and Perzanowski 2014).

On the basis of the abovementioned facts, we could expect the public to have positive attitudes for reintroducing the E. bison to new locations. This has been confirmed in some studies. For example, a survey of selected professional groups in Sweden found a relatively high acceptance (61.6% of respondents) for reintroducing the E. bison (Bergsten 2014). A study of the general attitudes of the inhabitants of central Lithuania found that the majority of society (85% of respondents) had positive attitudes towards the presence of E. bison (Balčiauskas and Kazlauskas 2014; Balčiauskas et al. 2017). Nevertheless, high levels of societal acceptance for E. bison reintroduction may not reflect local attitudes towards conservation efforts. In Lithuania, although most respondents accepted the existence of the E. bison, more than half did not want the species within 10 km of their residence (Balčiauskas and Kazlauskas 2014). Acceptance levels may also differ between professional groups, i.e., those who could potentially benefit from this conservation action support it more willingly than those who could suffer economic losses (Bergsten 2014). As a result, differences between communities can occur, and the regions whose economies rely more on the natural environment (resources) will hold significantly more negative attitudes towards the wisent (Decker et al. 2010). One of the main reasons for these negative attitudes is the risk of losing income from damage to crops and forest stands (Decker et al. 2010; Bergsten 2014; Balčiauskas et al. 2017). Such damages have been observed in the regions with higher E. bison densities in Poland (Hofman-Kamińska and Kowalczyk 2012; Paszkiewicz and Januszczak 2010). Among other important factors are fears of direct encounters with animals, possible limitations to game management (e.g., hunting), and even concerns for falling property values (Prior 2005; Decker et al. 2010; Balčiauskas et al. 2017).

Knowledge regarding the attitudes of communities to the E. bison in Poland is currently scarce and indicates there are differences between sites and professional groups. Although a

great proportion (87–88%) of the communities around Białowieża Forest (where the largest wisent population lives) supports the efforts to increase the numbers of this species in Poland, a similar percentage (85–88%) agreed that their numbers in Podlasie Province should not increase (Prior 2005). In the same study, foresters from forest complexes in northeastern Poland showed varying levels of support for efforts to increase the numbers of this species in Poland (13–74% of respondents declared their support). Moreover, a great majority of them (76–100%) agreed that numbers of E. bison in northeastern Poland should not increase (Prior 2005). Foresters from the Bieszczady Mountains had a similar attitude to the E. bison, where 87% were against an increase in numbers of the population in this region (Paszkiewicz and Karaś 2016). Other studies have indicated that communities near potential new sites have low acceptance for reintroduction of the E. bison, which could lead to local human-wildlife conflicts (Olech and Perzanowski 2014). Such conflicts, apart from increasing human-related mortality of animals, may induce conflict between local people and institutions, leading to erosion of trust in authorities (Ogra 2009; Treves et al. 2009; Woodroffe et al. 2005). This could consequently lead to lower general public acceptance for conservation efforts, including reintroductions (Clark et al. 2016).

The main aim of this study was to assess the attitudes to the E. bison of communities in northeastern Poland, the region hosting the majority of the Polish population of this species. For comparison, four different forest complexes were analyzed: two sites to which the animals will be reintroduced in the near future, and two other sites where E. bison subpopulations already exist. A second aim was to assess the factors affecting attitudes to the E. bison.

Methods

Study site

The study areas are located in northeastern Poland in two administrative units: Podlaskie and Warmińsko-Mazurskie provinces. In this region currently live over 80% of the individuals of the lowland line of E. bison free ranging in Poland (Raczyński 2017). Community attitudes to the E. bison were assessed in the vicinity of four forest complexes: Augustowska, Romincka, Knyszyńska, and Borecka forests (Fig. 1.). The former two complexes are planned targets for reintroduction, and the latter two are already occupied by E. bison.

Two of the four areas are vast forest complexes, covering over 1000 km² (Table 1). All of the study areas have low human population densities, but Augustowska Forest (no E. bison) and Knyszyńska Forest (with E. bison) have even lower human densities than the other two study areas.

Fig. 1 Location of the four study areas in northeastern Poland

Unemployment rates are comparable, although the study areas without *E. bison* have lower rates. The study areas also differ in arable land cover: Knyszyńska Forest has the highest share, Romincka Forest has an intermediate level (close to 30%), and Augustowska and Borecka forests have comparable percentages (less than 25%).

Surveys

The survey of attitudes towards *E. bison* adopted an explanatory mixed methods design that integrated quantitative and qualitative methods during the interpretation phase (Wisdom and Creswell 2013). The qualitative data were mainly collected through open-ended questions and were later transformed into quantitative data. Questions were asked in direct interviews with respondents, which is the method usually adopted for qualitative data collection (Gray 2013).

The main survey was preceded by a preliminary study on a group of 12 respondents. During this study, the questions were examined to determine whether respondents understood them or attempt to avoid them, as recommended by Bryman (2015). After the preliminary study, 16 questions were selected for the main study (Appendix 1) and were grouped into five subject areas: attitudes to (1) the surrounding area, (2) nature conservation, (3) state forests, and (4) the *E. bison*, as well as (5) metrics (age, sex, etc.). The first subject (attitudes to the surrounding area) was treated as a starting question and was not considered in the results. Questions regarding attitudes to the *E. bison* differed slightly between two groups of study areas. In areas without *E. bison*, respondents were asked what threats or benefits the presence of the species could potentially bring and how they would vote in a hypothetical referendum on reintroduction. Whereas in areas with *E. bison*, respondents were asked what threats or benefits are posed by and how they

Table 1 Summary of the characteristics of the study areas

Study area	Area (km ²)	Number of <i>E. bison</i>	Human population (ind./km ²) ³	Unemployment rate (%) ³	Arable land (%) ³	Meadows, pastures ³ (%)
Augustowska f.	1140 ¹	0 ²	17	8.8	24.3	14.9
Romincka f.	155 ¹	0	41	9.7	29.8	24.3
Knyszyńska f.	1050 ¹	134	13	12.5	40.6	10.7
Borecka f.	230	107	28	12.2	22.4	15.5

¹ Area along the border of Poland

² Possible migrating males

³ Mean values calculated from data on the municipalities covering the studied villages (www.stat.gov.pl)

would vote in a hypothetical referendum on the existing population—to eliminate, reduce, or maintain its current size. We did not include the option “increase the numbers” because the subpopulations in Knyszyńska and Borecka forests have already reached or even exceeded the carrying capacities of their habitats (Olech and Perzanowski 2014). To minimize social desirability bias, especially on the subject of the E. bison, we tried to apply indirect questioning (Krumpal 2013). Social desirability bias appears when respondents reflect on the way their answers may be perceived, which is possible in case of the E. bison, a species of high public interest. Answers were categorized on a 7-point Likert scale. The scale had the following subject areas: attitudes to (a) state forests, (b) nature conservation, and (c) the E. bison. The answers of respondents were categorized as follows: 1—strongly negative, 2—moderately negative, 3—slightly negative, 4—ambivalent, 5—slightly positive, 6—moderately positive, and 7—strongly positive (a full description of the categories is available in Appendix 2).

The entire study was conducted between 2011 and 2017 and covered 441 interviews—the breakdown of which is as follows: Knyszyńska Forest—95, Augustowska Forest—180, Romincka Forest—49, and Borecka Forest—117. All interviews were conducted in the homes of the respondents, which were chosen randomly.

Statistical analyses

To analyze the drivers of the attitudes of communities to the E. bison, we applied a generalized linear model because the response variable was not normally distributed and transformations failed. In the model, the attitude to the E. bison was the response variable, and respondents' location (Augustowska, Romincka, Knyszyńska and Borecka forests), sex, age (15–24, 25–44, 45–60, and over 60 years), education (primary school, secondary school, and post-secondary), employment (agriculture, forestry, pension, and other), and farm size (0–0.5 ha, 0.51–5 ha, 5.1–20, and over 20 ha) were set as fixed factors. Attitude to state forests and attitude to nature conservation were set as covariates. The best AIC value was obtained in a model with normal distribution and identity link function. We compared various model types with all interactions and a null model to achieve the best fit model using AIC in backward elimination. The comparison between groups was performed with a Bonferroni adjustment. All statistical tests were performed using SPSS software (version 24.0, IBM Corporation, Armonk, NY).

Results

The best fitting model included all variables and one interaction and was highly statistically significant ($\chi^2 = 235.46$; $df =$

26; $P = 0.000$) (Table 2). Attitudes to the European bison differed statistically between the forest complexes. Respondents in Augustowska and Romincka forests had similarly ambivalent attitudes, leaning towards slightly negative (mean = 3.84, SD = 2.92, and mean = 3.83, SD = 2.07, respectively), and both differed statistically from respondents in Knyszyńska and Borecka forests, who had slightly positive to moderately positive attitudes (mean = 5.08, SD = 2.21 and mean = 5.67, SD = 2.17, respectively), with no statistical difference between them (Fig. 2). The differences in European bison acceptance levels between the forest complexes resulted from differences in attitudes in selected occupational groups between the forest complexes (Location* Employment: $\chi^2 = 102.13$; $df = 15$; $P = 0.000$; Table 2). Statistical differences were found between farmers in selected forest complexes (Fig. 3). Farmers in Borecka Forest had attitudes that were almost strongly positive (mean = 6.60, SD = 1.81), which differed statistically from farmers in Knyszyńska Forest, whose attitudes were almost slightly positive (mean = 4.66, SD = 1.80), Augustowska Forest—ambivalent attitude (mean = 3.91, SD = 2.12), and Romincka Forest—slightly negative attitude (mean = 3.43, SD = 1.71). Much higher acceptance levels were found in the “other” occupational group of respondents in Knyszyńska and Borecka forests (almost moderately positive: mean = 5.71, SD = 1.74 and, mean = 5.86, SD = 1.80, respectively) than in Augustowska and Romincka forests, where they had slightly negative attitudes (mean = 2.71, SD = 1.70 and, mean = 3.82, SD = 1.75, respectively). In contrast, foresters and pensioners had statistically similar acceptance levels in all forest complexes (4.02–5.06 and 4.01–5.18, respectively).

The other statistically significant factors in the model were sex of the respondents and the area of arable land. Men were more

Table 2 Statistical summary of the multivariate generalized linear model of the attitude to the European bison and predictors: location, sex, age, education, employment, farm area, education $\times$ employment, attitude to state forests and attitude to nature conservation ($\chi^2 = 235.46$; $df = 26$; $P = 0.000$); non-significant interactions were excluded by AIC backward elimination

Source		Wald χ^2	df	P
Factors	Intercept	100.08	1	0.000*
	Location	63.01	3	0.000*
	Sex	3.99	1	0.046*
	Age	6.85	3	0.077
	Education	5.84	2	0.054
	Employment	0.63	3	0.889
	Farm area	13.68	3	0.003*
	Location $\times$ employment	29.59	9	0.001*
Covariates	Attitude to state forest	5.18	1	0.023*
	Attitude to n. conservation	25.31	1	0.000*

*Statistically significant

Fig. 2 Mean attitude levels to the E. bison ($\pm$ SE) relative to the locations of respondents and pairwise comparisons with the Bonferroni adjustment ($\chi^2 = 63.01$; $df = 3$; $P = 0.000$); n is indicated on the bars; statistically significant relations ($P < 0.05$) are indicated on the graph

positive about the European bison (mean = 4.75, SD = 2.63) than women, who had a rather ambivalent attitude (mean = 4.45, SD = 2.41), and this difference was statistically significant ($\chi^2 = 3.99$; $df = 1$; $P = 0.046$; Fig. 4). Farm size also differentiated attitudes to the European bison (Fig. 5). Respondents with the smallest farms (up to 0.5 ha and 0.51–5 ha) had slightly positive attitudes to the species (mean = 5.16, SD = 2.01 and mean = 5.94, SD = 2.14 respectively), and both differed from respondents with the biggest farms (over 20 ha), who had an ambivalent attitude (mean = 3.98, SD = 2.05). The group of respondents with farms 5.1–20 ha also had an ambivalent attitude (mean = 4.35, SD = 2.64), but which only statistically differed from the group with farms 0–0.5 ha.

Attitudes to the European bison positively correlated with attitudes to state forests and nature conservation (Table 2). Both relations were statistically significant, but the collinearity with the attitudes to nature conservation was stronger than with attitudes to state forests ($B = 0.207$, $\chi^2 = 25.31$; $df = 1$; $P = 0.000$ and $B = 0.113$, $\chi^2 = 5.18$; $df = 1$; $P = 0.023$ respectively).

Discussion

A clear difference was found between respondents living in the vicinity of forest complexes with E. bison populations and

Fig. 3 Mean attitudes levels to the E. bison ($\pm$ SE) relative to the occupations of respondents: **a** farmers and **b** other (for description, see text) in relation to the locations and pairwise comparisons with the

Bonferroni adjustment ($\chi^2 = 102.13$; $df = 15$; $P = 0.000$); n is indicated on the bars; statistically significant relations ($P < 0.05$) are indicated on the graph

Fig. 4 Mean attitude levels to the E. bison ($\pm$ SE) relative to the sex of respondents and pairwise comparison with Bonferroni adjustment; the difference was statistically significant ($\chi^2 = 3.99$; $df = 1$; $P = 0.046$); $n = 184$ for women, $n = 257$ for men)

respondents living in areas where reintroduction is planned (Fig. 2). This difference may be the result of varying perceptions of real threats and myths of the costs and benefits of E. bison occurrence in neighborhoods. Myths associated with wild species can cause negative attitudes; although evidence suggests such myths impact attitudes to carnivores (e.g., Lescureux et al. 2011; Theodorakea and von Essen 2016), but not herbivores. The question is whether large herbivores can also be associated with negative myths that affect attitudes to species. Inhabitants of Knyszyńska and Borecka forests have over 40–50 years of experience with free ranging E. bison (Krasiński and Krasińska 1992; Bozik 2008) and had more positive attitudes than respondents from Augustowska and Romincka forests, who have no such experience—which suggests they perceive E. bison reintroduction to the nearby forest complexes as a threat. The perceived threats may result

from prejudices deriving from old stories or culture, where, e.g., wolves are described as “outlaws” or “bloodthirsty” (Dickman et al. 2014; Theodorakea and von Essen 2016). The E. bison has been present in Polish culture for centuries (Samojlik 2005; Makowski 2005). Many descriptions of the species can be found in classic literature, where it has been described as “the wildest thing,” “with a huge body,” or “with bloody eyes” (Sztych 2008). Myths may also concern current conservation activities. In Greece, local people accused an NGO of secretly releasing wolves to nearby areas, because they began observing more individuals of the species than previously (Theodorakea and von Essen 2016). In the case of the E. bison, there exist opinions among local people that the conservationists responsible for reintroduction of this species will bring dozens of individuals and then go home, leaving local institutions to deal with possible future problems alone (Gładysz, personal comm.). Myths about E. bison and its’ conservation may complex due to perceived mismanagement of other wildlife species. Attitudes towards large herbivore conservation efforts are often related to experiences with crop damage (DeBoer and Baquete 1998; Shrestha and Alavalapati 2006), where the higher the levels of damage, the lower the acceptance. This may also be a reason for lower acceptance levels of E. bison. Damage to agriculture by wild animals has been increasing in Poland for years (Sporek 2014). This mainly pertains to wild boar, which cause a lot of damage, especially close to forest complexes (Frackowiak et al. 2013; Bobek et al. 2017). An animal as large (in size and mass) as the E. bison may naturally increase people’s fear of potential damages. This explanation is supported by the lower acceptance levels of farmers in Augustowska and Romnicka forests than in Borecka Forest (Fig. 3a); compared to these two forest complexes, in Borecka Forest, the real threats from E. bison are not regarded to be excessive. The professional group other was another factor that differentiated inhabitants with experience of free ranging European bison (with more positive attitudes to this species) from those without such

Fig. 5 Mean attitude levels to the E. bison ($\pm$ SE) relative to the farm size of respondents and pairwise comparisons with the Bonferroni adjustment ($\chi^2 = 13.68$; $df = 3$; $P = 0.003$); n is indicated on the bars, statistically significant relations ($P < 0.05$) are indicated on the graph

experience (Fig. 3b). This group is difficult to discuss as it comprises a variety of professions. We speculate that inhabitants involved in tourism could influence attitudes to E. bison. All the forest complexes have high touristic value, and the significance of this sector in Poland has been increasing in recent years (Uglis 2011). E. bison reintroduction increases the touristic value of forests, which may increase incomes for people involved in tourism; thus attitudes to this species are generally more positive in this professional group (Bergsten 2014). It is likely that respondents with experience of free ranging E. bison can see how their presence directly benefits tourism.

Farmers in Knyszyńska Forest had lower acceptance levels than farmers in the vicinity of Borecka Forest. This suggests that not only do perceptions play a role but that real threats from nearby populations are also shaping their opinions. This could be due to differences in conditions between the forest complexes. E. bison crop depredation around Knyszyńska Forest drastically increased in the years 2010 and 2011, which was related to an increase in their population (Sobczuk and Olech 2016). In contrast, no crop damage was documented in the vicinity of Borecka Forest. Despite farmers being paid compensation, human wildlife conflicts arose in Knyszyńska Forest (Sobczuk and Olech 2016). Such conflicts, as a result of real threats, could have affected the acceptance levels of farmers in this region. Another explanation could be the presence of a E. bison exhibition enclosure in Borecka Forest. Free access to the enclosure probably encourages local people to visit. In general, people that visit animals in captivity respond emotionally, which generates a wish to preserve them (Ballantyne et al. 2007). In Borecka Forest, this could increase support for conservation actions for this species and improve levels of acceptance. If such a mechanism exists, it should have affected the acceptance levels of other professional groups in Borecka Forest: however, foresters and pensioners had statistically similar attitude levels to their colleagues from other forest complexes. For this reason, damages to crops are likely the biggest factors that determine farmers' attitudes to European bison. This supposition is also supported by the lower acceptance levels of owners of larger farms (Fig. 5). This may be related to their higher dependence on incomes from agriculture or less traditional agricultural practices that may involve more human-wild herbivore conflicts (e.g., Fernando et al. 2005). Compared to Borecka Forest, Knyszyńska Forest has almost twice the proportion of arable land (Table 1), which suggests a higher dependence on income from agriculture or more intense farming.

Overpopulation of the E. bison in forest complexes is an emerging problem that must be solved in the near future. The high crop damages reported in the vicinity of Knyszyńska Forest (Sobczuk and Olech 2016) indicate that population numbers have exceeded the carrying capacity of the area. Active management of the population is thus necessary to

minimize human-wildlife conflicts. The main solutions in these types of situations are related to improving habitats that increase the carrying capacity of the forest complex (winter feeding, creation of open habitats inside the forest, introduction of plant species preferred by E. bison, etc.) (Klich et al. 2017; Olech and Perzanowski 2014) or export of individuals to breeding centers or new subpopulations. However, the opportunities for implementing these solutions are limited and will fail if the densities of these herbivores are too high (Perzanowski 2016). Besides, the creation of new populations is generally time-consuming, complicated, and allows for the transportation of only a few individuals to new locations at a time (Kaczmarek-Okrój et al. 2016; Olech and Perzanowski 2014). Perzanowski (2016) suggested that proper management of the E. bison should include lethal control. This method could improve bison health by the removal of sick individuals and reduction of population density (which reduces disease transmission) and help minimize human-wildlife conflicts. However, this is a controversial method that leads to social opposition.

We also found a lower acceptance level in women than in men (Fig. 4). This is probably tied to women having a greater fear of this species than men, which is consistent with some previous studies on attitudes towards large herbivores and predators (Gurung 2004; Hill 1998; Røskoft et al. 2007). The European bison is Europe's largest terrestrial mammal species, which can exacerbate the public's fear of it. Van den Berg and Ter Heijne (2005) suggest that women tend to more often respond with negative emotions, while men, as sensation seekers, respond more often with positive emotions. Nevertheless, there are many studies indicating women have higher empathy towards animals, more positive attitudes to animal conservation, and weaker focus on the need to provide utility (e.g., Serpell 2004; Taylor and Signal 2005; Yang et al. 2010). We did not recognize this gender predisposition for the E. bison and suggest further studies should be conducted on this topic.

Attitudes to the E. bison were also correlated with attitudes to nature conservation and state forests. The first relation is in line with expectations, as attitudes to conservation are tied to perspectives that value wildlife (Hermann et al. 2013). Respondents who are more oriented to nature protection will generally accept higher costs for supporting conservation. Moreover, people involved in wildlife conservation will also have better attitudes to reintroductions than others (Prior 2005; Nsoni et al. 2017). The relation between the attitude to state forests and the E. bison is also not surprising, as respondents associate this institution, alongside national parks, with the conservation of this species (Paszkiwicz and Karaś 2016). The studied forest complexes are not protected as national parks; thus, in our study areas, the E. bison is probably more associated with state forests than in Białowieża Forest or the Bieszczady Mountains (where there are national parks).

Reintroduction of a large and rare ungulate like the E. bison cannot occur without affecting communities. Local inhabitants not only may benefit from the presence of this species but also pay costs that may appear. The perceptions of real threats and costs will play an important role in the acceptance of conservation efforts. The presented study is the first showing the possible myths and real threats that are associated with attitudes towards the European bison in Poland. Negative attitudes to E. bison can be minimized by workshops organized around the forest complexes where E. bison reintroduction is planned (Olech and Perzanowski 2014). Open discussions in workshops can help clarify underlying issues and increase trust towards conservation authorities and thus improve attitudes towards conservation activities. Workshops should be mainly aimed at farmers with large farms and women. Moreover, the reintroduction of this species should not be planned in forest complexes with intense farming nearby.

We also found that acceptance can be related to the management of wildlife and protected species in the area. State forests, as an institution responsible for E bison conservation in the areas it manages, may influence attitudes to this species through its management of other species involved in human-wildlife conflicts. Similarly, management of the E. bison will not only influence the acceptance level of this species but could also influence attitudes towards state forests. This conclusion suggests that it is necessary to manage the E bison population in a way that prevents human-wildlife conflicts. Such practices are already good in the Borecka Forest complex, and consequently no human-wildlife conflicts appear, and attitudes towards E. bison conservation efforts are relatively high.

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